ICALENDAR FOR ANDROID

By

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DECLARATION OF ORIGINALITY

I declare that this report entitled **"ICALENDAR FOR ANDROID"** is my own work except as cited in the references. The report has not been accepted for any degree and is not being submitted concurrently in candidature for any degree or other award.

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Date : _____

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ABSTRACT

A printed calendar was used as a basic planner in the past. Moving to the mobile era, the printed calendar is replaced by the mobile applications (apps) because it is more convenient and easily available to the user. However, the current apps available in the market have not fully utilized the capability of a smart phone. The application designers usually neglect the usability of the application while designing the application. This project focuses on redesigning the calendar apps according to the user requirement. There are several new features that are specifically designed to tackle the common activities for users.

For some event, such as examination, shall not be interrupted by a phone call. The current calendar application records these events but does not implement any mechanism in preventing user from being interrupted. Thus, the **auto phone mode switching** mechanism is developed to switch the phone mode automatically (and return to normal after the event) according to event type. This includes **replying short messages to the phone caller automatically** by indicating the current event that the user is attending.

It is common for user to forget some important tasks at the end of the event. One of the important tasks is to check the belongings before leaving the venue. A **subtask check list** is created to remind the user about tasks or items to be prepared before and after the event.

Lastly, the interface of the calendar is redesigned so that it reacts similar to the printed calendar. The printed calendar allows user to **cross over several dates for one event**, if the event spans across dates. This feature is returned in the electronic calendar by **dragging over multiple dates** in this project.

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1-1 Motivation and Problem Statement

Mobile phone users commonly **forget to switch their phone to silent mode** when necessary and the ringtone may cause significant disturbance to others who are attending the same event and make self-embarrassment. Therefore, it will be great if the phone mode can be switch automatically based on the event that has been pre-set by the user in the mobile schedule. This is important due to inconvenience of change mobile phone mode adaptively according to the event type and avoid disturbance when an event occurs. For example, the Exam invigilation is referring to the case such as when students having exam and they forget to change the phone mode into silence or vibrate during the exam session. Eventually, if they set the exam slot in the mobile schedule and forget to switch it into vibrate or silence mode during the exam, it still will not automatically switch into silence or vibrate mode. Hence it would be great if the phone can change the mode based on the event that set in the mobile schedule and then return back to the normal mode automatically after the event ends.

Nowadays people are getting busy with their life, most of the time is been occupied by working, studying, and etc. In such situations, most probably they might **not available to answer the phone call**. Besides, in some events such as watching movie in cinema, attending a meeting, rest time and so on, and people would prefer to avoid from disturbance, hence set their phone to silent mode and causing they missed out the phone call. It would be useful if the phone able to reply the missed caller with predefined SMS and refer them alternative method to contact the user if necessary or call back at specified time. For example, people who having class or meeting during the lunch, it would be awful even if the person has set the phone to silence or vibrate mode, but their friend still spamming with calls to invite the user for lunch. Therefore

it will be brilliant if our smart phone able to reply the missed caller by automatically texting them when the schedule in our phone has already pre-set with specific event.

Invite people to join events could be a troublesome task. Users always have to use others method to send the invitation to the participants. Hence, it would be such a convenient to users as well if the mobile calendar application able to remind all other members who participate in the event that organize by the user with send them the notification through SMS, the notification message will be send out based on the reminder trigger.

Event reminder is important for users, but the times need to prepare for the event is significant as well. It would be useful if the calendar allow users to add a sub-event in an event in order to make users be **aware for the event preparation**. For example, a user needs to attend an exam on next Friday, preparation for the exam should be done on Friday, but on Monday user invite by his friend for hiking on Friday as well. On this situation, event preparation will be able to remind user on Friday have to do the exam revision and reject his friend invitation or postpone to some others day.

Adding multiple day events to a mobile calendar application could be a painful experience. With the dragging over multiple dates, users no longer require to add the event with day by day. For example, user has organized a same event on date 12th, 16th, 19th and 27th in a month. In order to add the event, user only have to dragged through these date in calendar, a add event form will be show and user only have to input the needed information and save it, the selected four days will be added with the same event. There is even more convenience if user have organize a two weeks continuous event such as campaign, user only require to add the event by start drag from the start date until the end date in calendar, and an option menu will show

and allow user to choose whether want to add the continuous day event or not. If user select yes, the saved event will be populate to each of day in this two weeks.

The mobile schedule currently available for Android OS essentially is a classical scheduling or timetabling with limited function. One of the flaws which is the reminder restrict from set for multiple entries. Secondly, the schedules have to be view by date to date, instead of viewing them together. Lastly, the features are limited since it only reminds the users of the event that input to the mobile schedule. Indeed, it unable to send text message via Short Message Service to people that are involves in the event, but the user self only.

1-2 Project Scope

The domain of the project is mobile application development. This project is to develop an enhanced version of electronic calendar that improves functionality, efficiency, and effectiveness as compared to calendar or timetabling applications available in the market.

1-3 Project Objectives

The application must be able to perform actions like:

- Allow user to add and delete multiple day and continuous event.

- Allow user to set event classification and notification.

- Allow user add event participants.

- Allow user add event sub tasks.

- Allow user to add event preparation as a sub event.

- Able to trigger event notification.

- Able to change phone mode based on event setting.

- Able to switch the phone mode to normal during end of event.

- Able to popup to-do list of event subtasks before and end of the event.

- Able to send short message service to notify event participants before event.

- Able to send short message service to caller when user unavailable to answer the phone.

1-4 Impact, significance and contribution

The way for time utilization will be depends on how to get the time manages by more effectively and efficiently. One of the most convenient methods is using the mobile calendar application to manage the time. iCalendar provides the special features that could increase easiness in our daily life.

Generally, iCalendar **helps people who commonly forget to switch their phone mode based on the environment and situation by changing the phone mode during the event** that been set in the mobile calendar, thus the phone will automatically go to silent or vibrate mode when the users are watching movie or attend meeting and switch back to normal mode once the event is finish. By using iCalendar, the phone user does not need to worry to miss or get disturb by the phone calls during the event.

CHAPTER 1 INTRODUCTION

Besides that, iCalendar are **able send text message to the missed callers with predefined Short Message Service depend on the user settings.** Users are allowed to choose whether to disabled or turn on this function as well. iCalendar provides adding event participant features. This enable user to have a **reminder with predefined Short Message Service which sends to event participant**. Users are allowed to disable the automatic sending reminder to event participant feature. Once the reminder notification is triggered, users are also allowed to select event participant to send reminder message.

Most of the event requires some preparation on it. However, user might forget to prepare it or the time they should prepare for the events has been occupied by some other activity without notice. Event Preparation feature in iCalendar is create to overcome this situation, user may **add sub-event in a main event as an event preparation.**

Eternally, iCalendar provide the **dragging over multiple dates features**, the user no longer required to select day by day on the calendar for continuous day events, indeed the user just have to touch and drag through the date.

Since the workload and require of more features for the mobile calendar, the enhanced become a must for it. With the innovative ideas above, mobile calendar will be improved to rich controls, settings, and special features. iCalendar finally will turn to be more convenient, easy to use, effective and efficient.

CHAPTER 1 INTRODUCTION

1-5 Background information

1-5-1 What is Scheduling, Why is This Important?

Scheduling is the process of by which the user check on the available time of them and plan on the way they will use it to achieve the goals which they have identified. By using the schedule properly, user would be able to understand what they can realistically achieve with their time. Scheduling is a planning process to fully optimize the use of available time. With the benefit of scheduling, user able to reserve enough time for the things they required to be done. Scheduling also is a planning process that helps preserve contingency time to handle 'the unexpected'. Lastly, scheduling helps people minimize stress by avoiding over-commitment to themselves and others (MindTools, 2012).

Why scheduling is important? It's not about the amount of time people have, but it's about what people are going to do with their time. The secret of effectively and efficiently use of time and greater enjoyment in life be determined by the organizing and planning of it. There is no magic or shortcut formula for time management (Southern Maine Community College, 2001). Since time goes without waiting for people, hence it is important that people need scheduling to help them plan on their time properly. Thus, they can fully utilize the time they had instead of letting it flow away without any purposes.

1-5-2 What is Mobile Application?

Mobile application (mobile apps) is a term used to describe Internet applications that run on Smartphone and other mobile devices. Mobile apps are available through application distribution platforms, which are typically operated by the owner of the mobile operating system. Examples for the owner of operating system are Apple App Store, Google Play, Windows Phone Store and BlackBerry App World. There are two categories of apps which is the free version and paid version. Normally, they are downloaded from the platform to a targeted device, such as an iPhone, BlackBerry, Android or Windows, but sometimes they can be downloaded to less mobile computers, such as laptop or desktop. Example of mobile application includes mobile Web site bookmarking utility, a mobile-based instant messaging client, Gmail for mobile, and many other applications. Mobile apps were originally offered for general productivity and information retrieval, including email, calendar, contacts, and stock market and weather information (OnGuardOnline, 2011). However, public demand and the availability of developer tools lead into rapid expansion into other categories, such as mobile games, factory automation, GPS and location-based services, banking, order-tracking, and ticket purchases and hence giving user a great amount of convenience.

2-1 Fact Finding

Below are the survey results which been conducted to fifty Respondents with different age range regarding the prefer use of traditional calendar.

below 21	20	33%
22 to 45	20	33%
above 45	20	33%
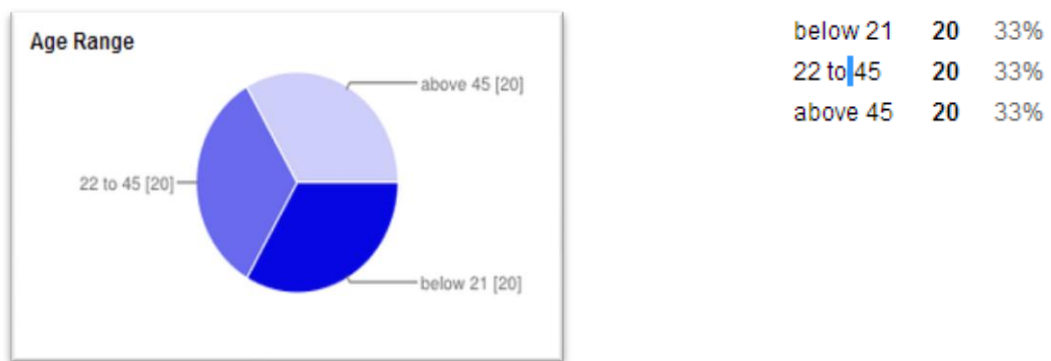
Figure 2-1-F1 Amount of Users Conducted Survey According to Age Range

Question	Below 21	22 to 45	Above 45
I frequent use the traditional calendar.	Strongly Disagree 10 50% Disagree 0 0% Neutral 0 0% Agree 3 15% Strongly Agree 7 35%	Strongly Disagree 18 90% Disagree 1 5% Neutral 0 0% Agree 1 5% Strongly Agree 0 0%	Strongly Disagree 4 20% Disagree 0 0% Neutral 0 0% Agree 1 5% Strongly Agree 15 75%
Traditional calendar is portable enough.			

	Column 1	Column 2	Column 3
	Strongly Disagree 10 50% Disagree 1 5% Neutral 0 0% Agree 4 20% Strongly Agree 5 25%	Strongly Disagree 20 100% Disagree 0 0% Neutral 0 0% Agree 0 0% Strongly Agree 0 0%	Strongly Disagree 4 20% Disagree 1 5% Neutral 0 0% Agree 6 30% Strongly Agree 9 45%
Traditional calendar provide privacy on my personal planning.	 Strongly Disagree 10 50% Disagree 2 10% Neutral 0 0% Agree 7 35% Strongly Agree 1 5%	 Strongly Disagree 20 100% Disagree 0 0% Neutral 0 0% Agree 0 0% Strongly Agree 0 0%	 Strongly Disagree 4 20% Disagree 6 30% Neutral 0 0% Agree 6 30% Strongly Agree 4 20%
The public holiday stated in traditional calendar provide convenient for my event planning.	 Strongly Disagree 7 35% Disagree 3 15% Neutral 0 0% Agree 1 5% Strongly Agree 9 45%	 Strongly Disagree 18 90% Disagree 0 0% Neutral 0 0% Agree 2 10% Strongly Agree 0 0%	 Strongly Disagree 4 20% Disagree 0 0% Neutral 0 0% Agree 0 0% Strongly Agree 16 80%
I will not miss out the plan which mark on traditional calendar frequently.	 Strongly Disagree 10 50% Disagree 5 25% Neutral 0 0% Agree 5 25% Strongly Agree 0 0%	 Strongly Disagree 20 100% Disagree 0 0% Neutral 0 0% Agree 0 0% Strongly Agree 0 0%	 Strongly Disagree 2 20% Disagree 6 60% Neutral 0 0% Agree 0 0% Strongly Agree 2 20%

I frequent use mobile phone.	Strongly Disagree 3 11% / Disagree 7 25% / Neutral 0 0% / Agree 8 29% / Strongly Agree 10 36%	Strongly Disagree 0 0% / Disagree 0 0% / Neutral 0 0% / Agree 2 10% / Strongly Agree 18 90%	Strongly Disagree 1 5% / Disagree 0 0% / Neutral 0 0% / Agree 11 55% / Strongly Agree 8 40%
I often use mobile calendar application.	Strongly Disagree 4 20% / Disagree 6 30% / Neutral 0 0% / Agree 0 0% / Strongly Agree 10 50%	Strongly Disagree 0 0% / Disagree 1 5% / Neutral 0 0% / Agree 1 5% / Strongly Agree 18 90%	Strongly Disagree 13 65% / Disagree 3 15% / Neutral 0 0% / Agree 0 0% / Strongly Agree 4 20%

Table 2-1-T1 Results of survey

2-2 Literature Research and Review of Previous Work

2-2-1 Google Calendar

Google calendar is the mobile calendar app which able to view events from user's Google Accounts and synchronizes with their Android device (Google, 2012). Therefore, users need to have a Google Account in order to use the Google Calendar. (Google, 2013).Google Calendar comes with several main functions. Users schedule can be view by anyone with the share permission provide by users. Besides, the notification can send to user via email or SMS by set through the reminders (Google,

2013). Event invitation can be send to friends then keep tracking the responses and comments at the same place (Google, 2013). Besides, a unique feature present in Google Calendar which is it able to get sync with others desktop application like Apple iCal and Mozilla Sunbird (Google, 2013). When there is no internet connection available, Google Calendar even allows users to check on their schedules due to the ability of offline mode (Google, 2013). The calendars app is free, but if users using the SMS reminder feature, the mobile operator charge of SMS will still be apply (Google, 2013) (Jorte, 2012).

The newest version of Google Calendar has ability to send a quick email to participated event guest with the customizable message (Google, 2012). Besides, the snooze notification features available as well in the reminder (Google, 2012).Google has provide the support documentation due to the consideration of difficult functions might be hard to use for beginner (Karch, n.d.). Agenda view is part of Google Calendar; it can use to shows every scheduled event in a list form. Create new schedule appointments or events can be done by a simple click-and-drag interface (Google, 2012). Appointments may set with a subject header, or select to insert more details. As example, take notes of the appointment location and a short description (Google, 2012). Events that reoccur frequently may use the "repeat" function to create it (Strickland, 2012).

The weakness of the Google calendar is that the day and week views might not function on some devices (Google, 2012). Besides that, notes and picture will be removing from all events. Furthermore, the local events that have not synchronised might be lost after installing Google Calendar (Google, 2012). Moreover, delegation is not support on Google Calendar, this was mainly well-known as a weakness by the Writing Centre, where they schedule a lot of meetings with students each day (Oregon State University, 2011). The invitations are not able to forward by email in Google

Calendar. Meanwhile, Google calendar not allow to tune the time zone when create new events (Savina, 2010).

2-2-2 Jorte Calendar

User friendly interface and easy operating are present in the Jorte Calendar as an individual planner (McQuilken, 2011). It provides the scheduler features and customization views (McQuilken, 2011). Jorte Calendar able to view by monthly or weekly and it even can rotate the display by itself automatically (McQuilken, 2011). Design of Jorte Calendar is quite similar to an actual paper organizer with user friendly interface and easy to use (Jorte, 2012). With one scan, user is able to check on their important schedules which are set in red colour and the overdue schedules as well (Jorte, 2012). Meanwhile, it allows user to customize the first day of the week, insert public holiday's events and also add the custom public holidays (Jorte, 2012). To-do list lets user check on the red coloured important schedules or reorganise the order of the items in the list, the to-do list even able to import from or exported to a CSV file. Jorte Calendar has the function to use the Google Voice to control it (Jorte, 2012). Jorte Calendar can be either synchronize with its Jorte's Cloud or Google Calendar and can be supports by many widgets (Jorte, 2012).

Jorte Calendar can display tasks list and daily agenda in the month view, it even will rotate by itself when users turn the device into landscape view (Gordon, 2011). Jorte Calendar can perform in many kind of view and it also able to integrate to others apps such as Google Maps (Gordon, 2011). User may insert the event's location and open it up in the Google Maps (Gordon, 2011).

One of the weaknesses of Jorte Calendar is it unable to synchronize with other task service (Gordon, 2011). There another weakness is that it difficult to adjust the widget setting after placed on desktop (McQuilken, 2011).

2-2-3 CalenGoo Calendar

Interface of CalenGoo calendar is understandable and easy for practical use (Gordon, 2011). Several views can be select from the top, user may select the day to check for more and add a new event and so on (Gordon, 2011). It allows user an efficient and easy method to access and edit the Google Calendar or it even able to work with any Android built-in calendar as well (CalenGoo, 2011). User able to select either one of the five view to display their events, which are day view, week view, month view, landscape day view and agenda view (CalenGoo, 2011). Besides, a simple swipe gestures can be used to change the view as well (CalenGoo, 2011). The events in CalenGoo Calendar are showed in the same calendar colours which user use in their Google Calendar, this view made it similar with the Google Calendar web view and will try to match the Google Calendar view as it can. (CalenGoo, 2011). Copy or move the events are able to perform by drag and drop function (CalenGoo, 2011). Besides, it features is quite similar with Google Calendar, such as the reoccurring events, event invitation, check the responses and send reminders by email or SMS that provide by Google Calendar as exist on CalenGoo Calendar as well (CalenGoo, 2011). There is a unique function of CalenGoo Calendar, which it able to set the phone mode to mute when the event occur (CalenGoo, 2011). Birthdays of the user contacts are displayed as well.

Google Task is support by CalenGoo (Gordon, 2011). Among Android based calendar, CalenGoo has the most advanced reoccurring events system overall (Gordon, 2011). CalenGoo Calendar offers user an efficient way to control their Google Calendar with iPhone, iPod touch or iPad (Shane, 2011). Any change of CalenGoo are able to saved and uploaded later on when the device is connection to internet again, this allow it to operate in the offline mode (Shane, 2011). The Google Task support provides user the conveniences to have their task and calendar all in one

apps (Shane, 2011). Invitation is one of the great features of CalenGoo as well (Shane, 2011). This feature lets user to invite people to events and to check on their status (Shane, 2011). People who get invited will receive an invitation email with a links to either accept or decline the invitation (Shane, 2011). There is strength of CalenGoo, it offers user to display their calendar in several forms and easily to zoom by multi touch (Shane, 2011).

One of the weaknesses is that the display of the CalenGoo Calendar looks messy such as in the month view (Appato, n.d.). Besides that, some of the screens are not showing the title and this may cause confusion to the users (Appato, n.d.).

2-2-4 Pocket Informant

Pocket Informant is a popular personal organizer for Windows Mobile platform, but in fact it does not perform quite well in Android system (Gordon, 2011). Instead of port the Windows Mobile version to Android OS, Android based Pocket Informant is completely re-develop from the beginning for its Calendar and Task management solution (WebIS, 2012). Fully integrated calendar and Task management are available in this calendar apps, while user is able to select from year, month, week, day agenda and today views (WebIS, 2012). User is able to customize the view base on what user needed (WebIS, 2012). Besides, this app has a filter function which is able to perform the events filtering per view and a template in the apps allows the user to insert the reoccurring events efficiently (WebIS, 2012). Pocket Informant has the ability to display or hides the others calendars in Android as well (WebIS, 2012). It provides a highly configurable interface with more than one hundreds of different choices (WebIS, 2012). Multiple internal Event calendars is supports by this apps, providing user more elasticity way to save their Pocket Informant data isolated from the native

Android calendars (WebIS, 2012). Instead like others free calendars, user has to purchase to use it with USD $9.99, but it still provide fourteen days for user getting try on it (WebIS, 2012).

Contact manager such as note app, task manager, and calendar tool are present in Pocket Informant for phones and tablets (Kendrick, 2012). The strengths Pocket Informant would be its online synchronization, configurable views, and linking events to actions (Kendrick, 2012). The contact manager liked features make it simple for users to in charge their information and make it work smoothly (Kendrick, 2012). Any edit on the calendar will reflects to the Cloud synchronization and the apps in Android OS instantly (Kendrick, 2012). Besides, it even able to sync with the Mac desktop manager. (Kendrick, 2012). It does not only list the users' daily appointment, but any present event list item as well (Kendrick, 2012).

There are a few weaknesses for Pocket Informant such as it cannot view according to month. It's unable to view the entire week or view the event and tasks separately (Allen, 2012). Besides that, Pocket Informant on Android version is weak due to the time zones and tasks (Allen, 2012). It is difficult to distinguish the parent or child relationship in particular Task views (jhrogersii, 2010). In the latest version, Event only can be viewed in the task view, but not in today or calendar views (Allen, 2012). Another weakness is the synchronization method, which the sub-tasks will still persist in the local Pocket Informant database unrelated the user's synchronization method, they only able to sync with a "Toodledo Pro" account, which requires a subscription fee (jhrogersii, 2010).

2-2-5 Touch Calendar

Touch Calendar is focuses on the interface design which is quite similar with Business Calendar (Gordon, 2011). It navigates by using the touch screen gestures, such as pinch to zoom, scrolling, etc. (Gordon, 2011). It allows user to check their Google Calendar information clearly even by using the three or four inches screen device and the native pinch-to-zoom ability of Android OS is working well on this apps as well (Taylor, 2011). Different with the usual Android calendar, it does not only shows the on-going events, but it also display what is happening, similar with what desktop calendar view present (Taylor, 2011). The colour arrangements of user's various calendars are also carried over (Taylor, 2011). This features bring a lots of conveniences for user who user several of the handy Google calendars to manage the public holidays and sporting events and would like to immediately separate them out for easy views (Taylor, 2011). By indent of its five opening zoom settings and five font sizes, it's potential to quickly provide user the ideal launch-layout depending on how many calendars user want to shows on their device screen, and how many information they want to view for a day (Taylor, 2011). Touch Calendar has free and full version, the full version cost USD $2.95. The different is the full version has wide support on the development, thus all the new features and most fixes will provide only for the full version (Taylor, 2011).

The strength of Touch Calendar is that it allows users to view every day's schedules of a month in one view (Google, 2012). Others calendar display to users with colour code on a day or some other substance but Touch Calendar allow users to see every individual appointment on every single day (Google, 2012).

Touch Calendar does not has agenda view. Besides that, in order to insert an event, users have to go into the menu page to add event (McQuilken, 2011).

2-2-6 Business Calendar

Business Calendar provides the abilities of scroll-able and zoom-able multi-day view (Google, 2012). Business Calendar is a well-developed calendar app which able to synchronize with Google calendars (Google, 2012). Besides, it allows user to organise freely from day one to fourteen with present in graphical and textual views (Appgenix Software, n.d.). This apps supports month, agenda, day and event view. Month view able to easily changed between timeline bars and event titles; a popup window provides user a quick summary of the events on the selected day (Appgenix Software, n.d.). Meanwhile, Business Calendar provides an in-built new handling option, this feature allows user easily to open a selected day in multi-day view by moving their finger over the selected day in the month view (Appgenix Software, n.d.). Business Calendar provides some standard features which can be found on others Android calendar as well (Appgenix Software, n.d.). Business Calendar has paid and free version, the paid version cost USD $4.99 (Appgenix Software, n.d.). The paid version of Business Calendar is free of Ads and it's included with several unique features which cannot be found on the free version (Appgenix Software, n.d.).

Instead of shows the "week", "4-day", "month", and so on, Business Calendar is able to initial open with a month view and may tap and drag on a specific set of days to minimize the view to those days (Google, 2012). A small pop-up will be shows when tap on a specific day in order to display that day's events, and users may swipe to an agenda view as well (Google, 2012). It offers a list of calendars at the bottom user able to show and hide the different calendars (McQuilken, 2011). User is able to drag and drop a reoccurring event, instead of repeat inserting the events (McQuilken, 2011). This apps has a unique feature, it able to intelligently collapsing of a long event description, it even has the option to directly dial a number that has been added in the event title and check the event information by the scroll mode (Gordon, 2011).

Business Calendar is lack of some features such as task list support or integration with other apps (McQuilken, 2011). It also has too much information compacted on the same screen in result that the display looks messy (McQuilken, 2011). Furthermore, the widget only can be scrolls by button instead of a touch (McQuilken, 2011). Moreover, the tablet display of this calendar is poor in resolution (McQuilken, 2011).

2-2-7 Critical Remarks of previous works

Based on the analyzed before this, there are few Android calendars which are available on the market currently which are provides the similar features which suggested by this project. Below clearly describe the strengths and weaknesses of the similar features of those calendar apps in simplified way.

Mobile Calendar	Strengths	Weaknesses
Pocket Informant	Strength of Pocket Informant which is similar with the feature in this project is able to add the sub-events in a main event.	It is difficult to differentiate which the main-event and sub-event in certain view.
CalenGoo	CalenGoo Calendar offer user the feature to send the reminders as the notifications through the SMS. Besides, based on the events sets on the calendar, the app will automatically mute the phone during the events occur.	The notifications of reminders through SMS are only apply for the individual events. Only allow to mute the phone automatically during events occur.
Touch Calendar	Touch Calendar provides many of the features which enhanced on the touch for zoom, scroll or select.	No dragging over multiple dates features available.

Table 2-2-7-T1 Strength and Weakness of Existing Mobile Calendar

Compare to the Pocket Informant, iCalendar able to distinguish the main-event and sub-event easily, and it's even allows user to add several sub-events in within a main event. For the CalenGoo Calendar, SMS notification is only able to use for individual events, but the SMS notification in iCalendar mobile calendar application is even able to send the predefined SMS to the missed caller and the participants of the group events as well. Meanwhile, it also able to switch the phone mode automatically based on the events and switch back to normal mode once the event end, but not only able to mute the phone. The Touch Calendar lag of the multiple selection enabled when compared to the dragging over multiple dates feature in iCalendar mobile calendar application.

2-3 Data Collection

Based on the analysis of the survey results, it shows that the traditional calendars mostly are more preferred by the people who age range from forty five onwards. On the other hand, the people who from age range below forty five most of them are not using the traditional calendar anymore. People from age range below forty five basically are more preferred to use the mobile calendar as their scheduling calendar, this believes is due to the education level is higher in this age range of people. They are more familiar with the latest technology and have no difficulty to operate the mobile applications. Thus this project is developed to focus on the target of people below ages forty five.

CHAPTER 3 PROJECT DESIGN

3-1 Methodology and tools

3-1-1 Methodology

Android mobile application development projects basically follow different development models for different kinds of projects. The selection is based on the size of the project, urgency, client requirements and so on. The various development models that Android Mobile Application Development are follow is **Agile, Waterfall** and **Rapid Action Development (RAD)** (Android Mobile Development, 2012).

However, based on the scenario of this project; the most suitable system development methodology is rapid application design (RAD). RAD is chosen because of fast implementation, it delivers a faster way and high quality result of build up a system.

Three approaches are available for RAD which are **phased, prototyping** and **throwaway prototyping**. **Prototyping** will be chosen as the approach for RAD. It emphasizes on prototypes for the system. Basically there are four general phases involving in system development are planning, analysis, design and implementation (Dennis, et al., 2010). It takes short time on planning and performs analysis, design and implementation concurrently to build the first version. It performs re-analyze, re-design and re-implementation after sponsor provides for comments or suggestions (Dennis, et al., 2010). The concurrently phases will iterative until the sponsors agree that the prototype provides enough of features (Dennis, et al., 2010).
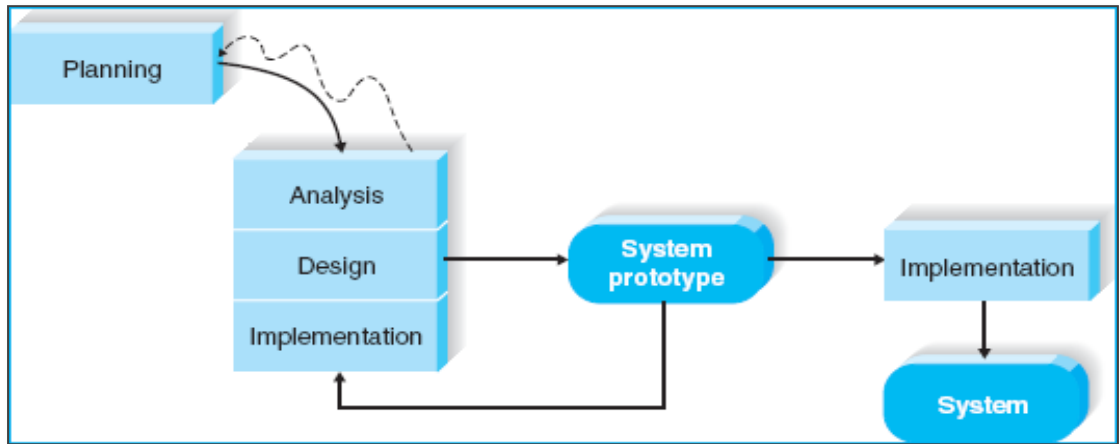
Figure 3-1-1-F1 System Prototyping (Dennis, et al., 2010)

3-1-2 Tools

Programming environment for Java development is needed to create Android application. First, a **Java Development Kit (JDK)** has to be installed. One of the current industrial standards for Java Integrated Development Environments (Java IDE) with Java Development Tools plug-in is **Eclipse Standard Development Kit (Eclipse SDK)** (Darcey & Conder, 2012). The applications used to develop this system are **Eclipse SDK 4.2.1** and **Android Software Development Kit (Android SDK)**. **Android SDK Manager** is part of the Android SDK in that is used to install packages of Android SDK Platform-tools and **Application Programming Interface** (API, from Android 4.0.X to 4.2.X). This due to the android calendar API only is open for public start from API **Level 14.** Therefore, Android API 4.0 is targeted for this project as the minimum requirement for the prototype. **Android Virtual Device (AVD)** is a tools provided with the Android SDK to manage Android emulator. The emulator allows Android application to run on computer for testing and debugging purpose.

3-1-2-3 General Work Procedures

In planning phase, users' requirements of project are gathered to cover the overall of the project. A survey (questionnaires) is conducted to discover more requirements as the project progresses. With the detailed research and review, Eclipse is been selected as the Android application developing software due to the availability and flexibility of it.

For the analysis phase of initial cycle, the survey (questionnaires) obtained from the planning phase is analysed in order to prioritize each feature. From the second development cycle onwards, the prototype developed from the previous cycle is reviewed. The interfaces and features are redesigned according to the review.

For the design phase of initial cycle, a featureless prototype is developed to show the general flow of the application. In the second development cycle, the basic graphical user interface of a calendar is designed and built (i.e. support only single touch/select only single day in the calendar). A complete interface with dragging over multiple dates support will be designed progressively as the number of development cycle increases.

For the implementation phase of initial cycle, the feature with highest priority will first be implemented on the featureless prototype (from the design phase). Each feature listed in the requirement (e.g. event notification, auto-SMS, auto-switch mode, dragging on multiple dates) will be implemented from one development cycle to another. The features will be tested on an AVD for the initial cycle. As the project progresses, the testing and debugging process will then be transferred from the virtual device to actual smart phone with Android operating system. In addition, the prototype will be tested first with Android 4.2 API (i.e. the latest API available) and

progressively reduce to Android 4.0 API. This is purposefully to maximize the coverage of Android devices in the market nowadays.

3-2 Requirement

3-4-1 General Capabilities

Based on the survey's results analysis, most of the respondent like to have the calendar application integrated with extra function to reply miss caller with predefined SMS, this is due to most of them are often miss out or not available to answer the call at most of the time. Besides, the cost expenses are more concern for the low education level respondent compared to the high education level candidate.

Respondents are more like to have the feature to send the event notification SMS to the event participants. This is because of most of the respondents are organize the group event frequently and most of time the event participant will mess out or forgot the date and time of the event. Similar with the above, respondents with low education level are more concern for the SMS expenses and majority of the high education level respondent are not concerns about it.

All respondents from survey are wishing to have the automatically changing phone mode function based on their events in calendar. This is due to respondents are change the phone mode very frequent depend on their situation and environment, they stated it is annoying to perform this manually and would be great if the phone mode able to change by itself based on the events.

Majority of the respondents would like to have the dragging over multiple dates when select the date in calendar to insert their reoccurring or continuous day events.

Respondents agree that they often have the reoccurring and continuous day event and it is difficult to manage the event by tapping on the calendar day by day.

3-4-2 User Characteristics

iCalendar is focused on users with age range between twenty two to fifty four with high education level. These users are more **familiar with the Smartphone** and this made them easier to operate the calendar application. Besides that, users are able to **take advantages from this application** to manage their daily busy work and activities on hand no matter when and where they are.

CHAPTER 4 PROJECT SPECIFICATION

4-1 Performance Analysis

The application performed well on the basic features such as add, edit and delete event. Besides, it has achieved the main expected functionalities, among them event notification, automated SMS reminder, automated SMS reply, automated phone mode switching and dragging over multiple dates are workings very well. However, due to the unexpected situation and condition on actual usage, false detection may still be occurring. The following will describe the elements that will influence the application performance.

4-1-1 Add One Event

Four main functionalities tested with trigger them by using the normal one day event. They are 1) Event notification, 2) Automated SMS Reply, 3) Automated Phone Mode Switching. 4) Dragging over multiple dates. Two scenarios have been applied to test on it which is one event to trigger only one function and one event to trigger all functions at the same time. Same scenarios have repeat tested for three times on random date. Device powered by Android version 4.1.2 was used on this test.

On these two scenarios, each of the main functions is successfully to be triggered on time on three random dates as expected.

4-1-2 Add Multiple Event

The four main functions tested by applied the test setup that similar to "Add One Event" test. However, instead of random three days, the test was done on random three oncoming weeks. On the two scenarios, each of the main functions is successfully to be triggered on time on the selected date. Meanwhile, the test on random three oncoming weeks was performed expectedly as well.

4-1-3 Add Continuous Day Event

The four main functions tested by applied the test setup that exactly the same to "Add One Event" test. On the two scenarios, each of the main functions is successfully to be triggered on time on the continuous dates.

4-2 Design

4-2-1 Use Case Diagram
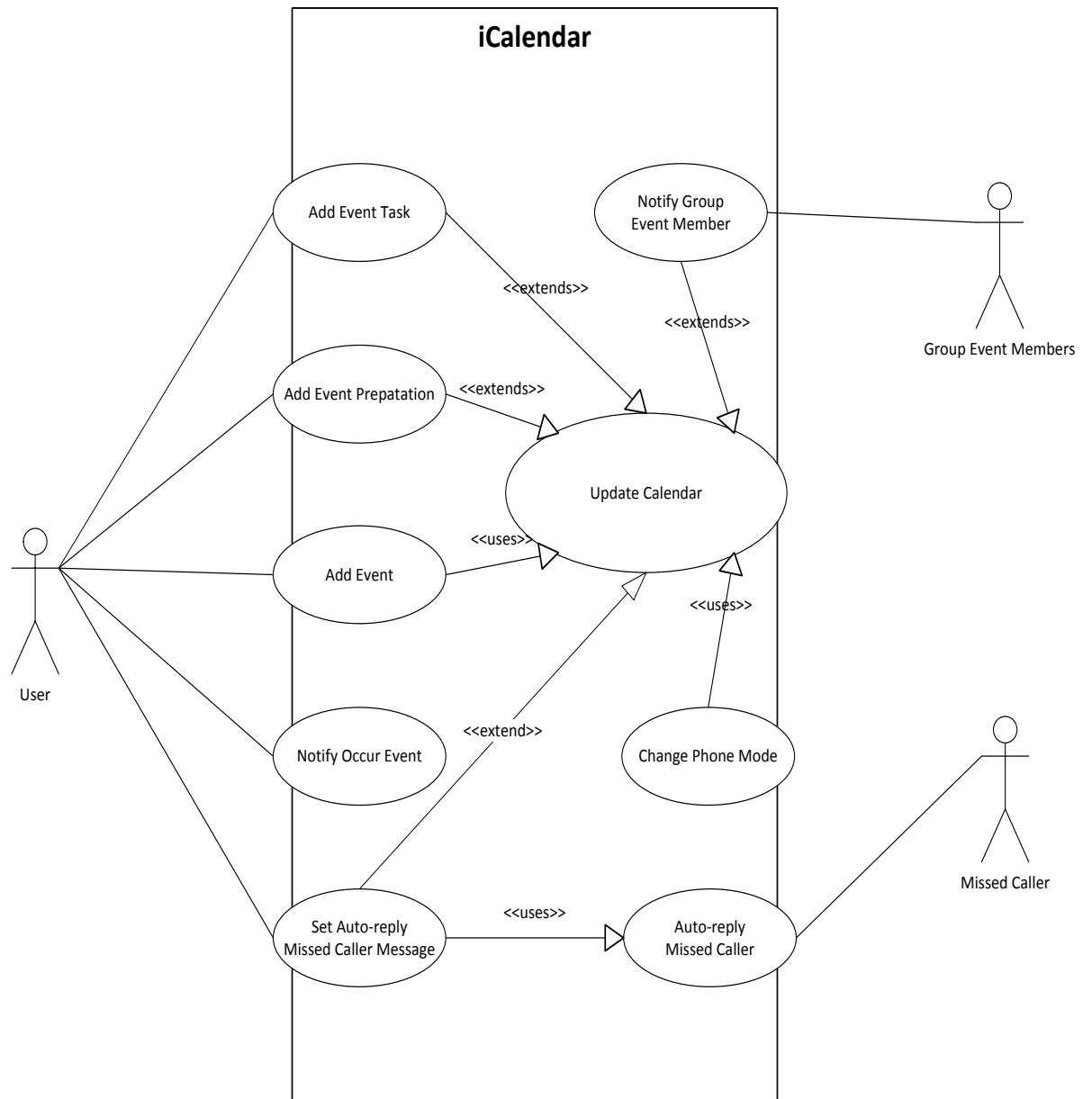
Figure 4-2-1-F1 Use Case Diagram

4-2-2 Class Diagram
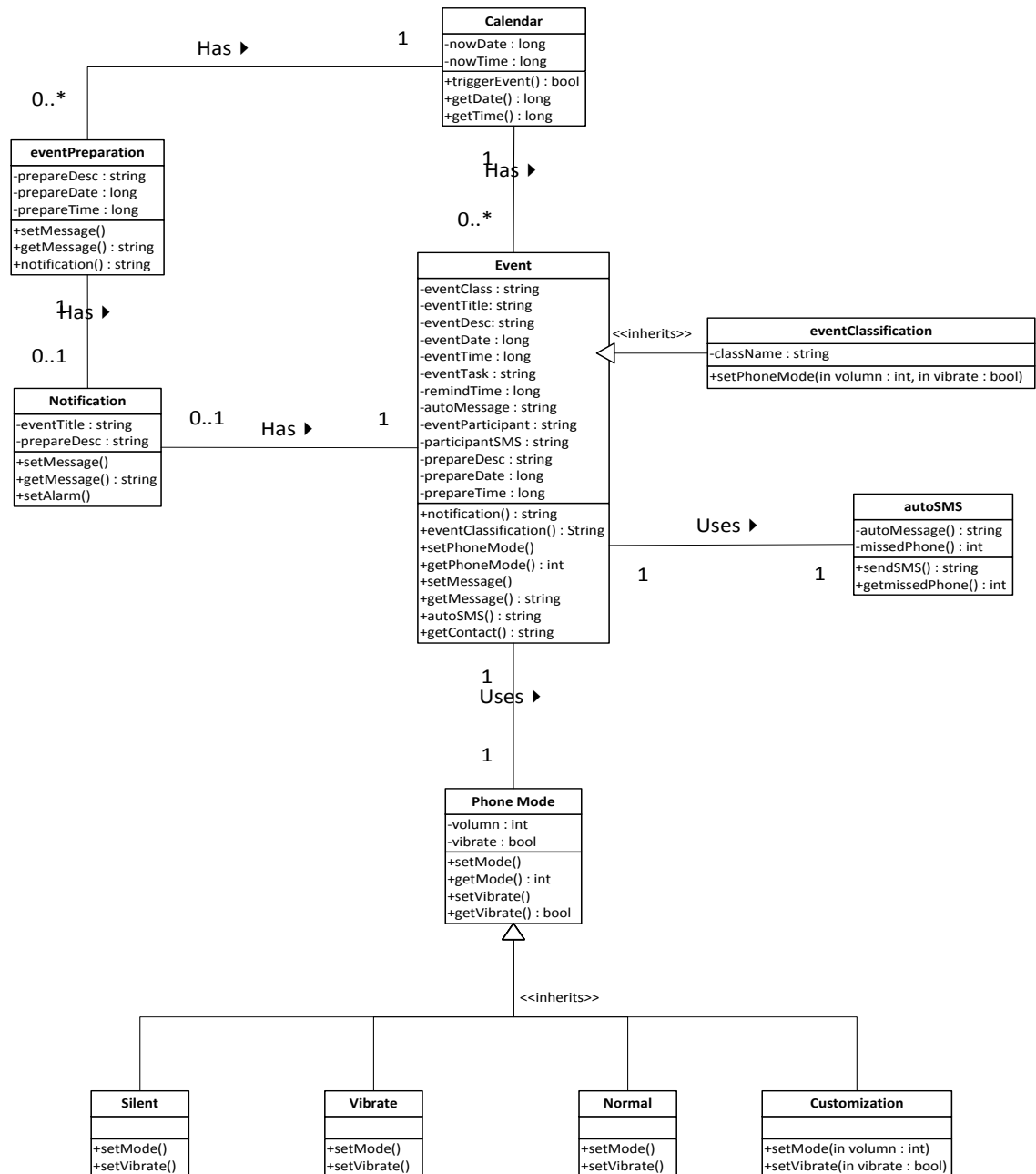
Figure 4-2-2-F1 Class Diagram

4-2-3 User Interface

<u>4-2-3-1 Calendar View</u>

Figure 4-2-3-1-F1 Calendar Splash Screen

Figure 4-2-3-1-F2 Calendar View with No Today Event

The current calendar month will continuously show next month when long press on right arrow and continuously show previous month when long press on left arrow.

Figure 4-2-3-1-F3 Calendar View with Today Event

If zero event on the particular day, the current calendar view will be shown in Figure 4-2-3-1-F2. If particular day have one or more than one event, the current calendar view will be shown in Figure 4-2-3-1-F3.

Figure 4-2-3-1-F4 Calendar View after tap on Day

Once users tap on the 14, the colour of the day will be changed, as shown in Figure 4-2-3-1-F4.

Figure 4-2-3-1-F5 Calendar View after swipe on Day

Once users swipe from 18 to 24, the colour of the days will be changed, as shown in Figure 4-2-3-1-F5.

Figure 4-2-3-1-F6 Calendar View with Today Event swipe up

Once users tap or swipe up the "Today Event" view, event list of the day will be displayed, as shown in Figure 4-2-3-1-F6.

Figure 4-2-3-1-F7 Today Event To-Do List I

Once users tap on the "Today Event" list, the particular event to-do list will displayed, as shown in Figure 4-2-3-1-F7. This allows user to check the check box when the task is finished.

Figure 4-2-3-1-F8 Today Event To-Do List II

Once users finished the entire task on the event list, the particular event to-do list will displayed, as shown in Figure 4-2-3-1-F8.

Figure 4-2-3-1-F9 Remind Participant List

Users are allowed to view the event participant for the particular event, as shown in Figure 4-2-3-1-F9.
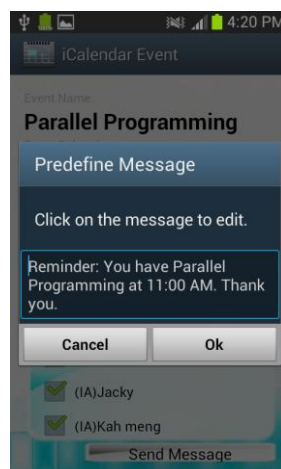
Figure 4-2-3-1-F10 Remind Participant Predefine Message

Users are allowed to re-send the remind message to participant and the pre-defined message will be popped-up, as shown in Figure-4-2-3-1-F10.

4-2-3-2 Show Event View

Figure 4-2-3-2-F1 Calendar View with Menu

Once users press the Menu key, a menu with "View Event" and "User Manual" will be displayed, as shown in Figure 4-2-3-2-F1.
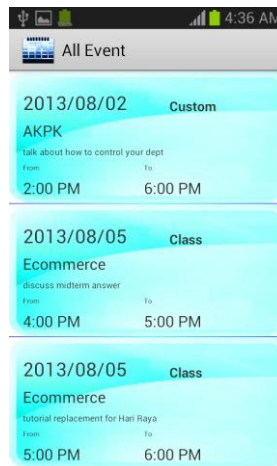
Figure 4-2-3-2-F2 All Event View

If user tap on the "View Event" from the lists of menu, all events will be displayed, as shown in Figure 4-2-3-2-F2.
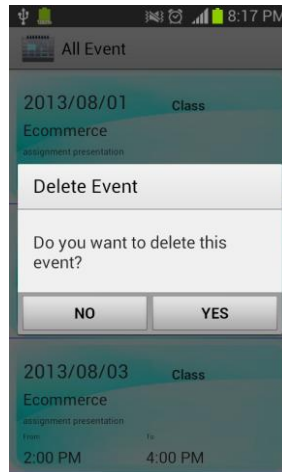
Figure 4-2-3-2-F3 Alert Dialog to Delete Event

Once users tap on one of the event from the lists of event, an alert dialog to delete event will be prompted, as shown in Figure 4-2-3-2-F3. This allows the user to delete the event and resume the show event view.

Figure 4-2-3-2-F4 Delete Event View

Once users deleted the event from the lists of event, "Delete was successful" message will be toasted, as shown in Figure 4-2-3-2-F4.
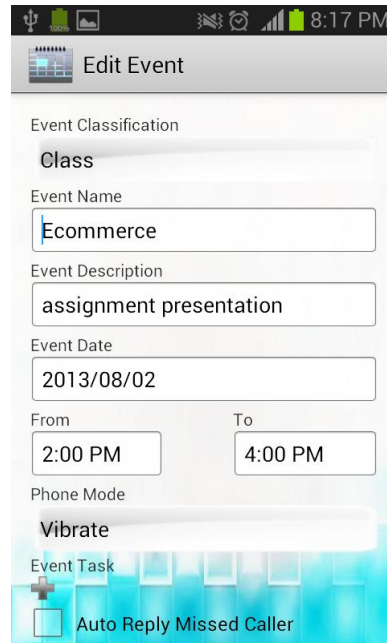
Figure 4-2-3-2-F5 Long Press on Event List View

Once users long press on the event from the lists of event, "Edit Event" activity will be started, as shown in Figure 4-2-3-2-F5.

4-2-3-3 Add Event View
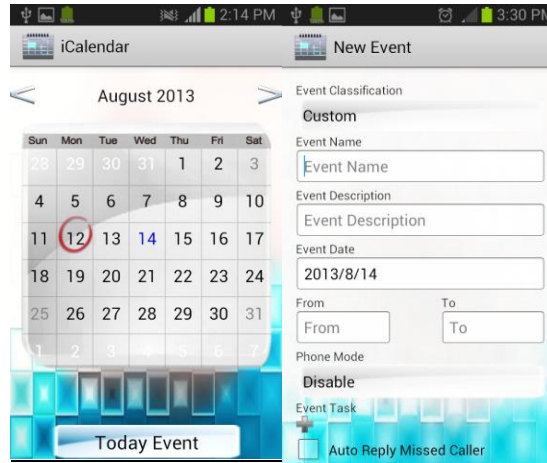
Figure 4-2-3-3-F1 Add Event Form I

Once users tap on one of the day in calendar view for 3 seconds, a form to add event will be displayed, as shown in Figure 4-2-3-3-F1.
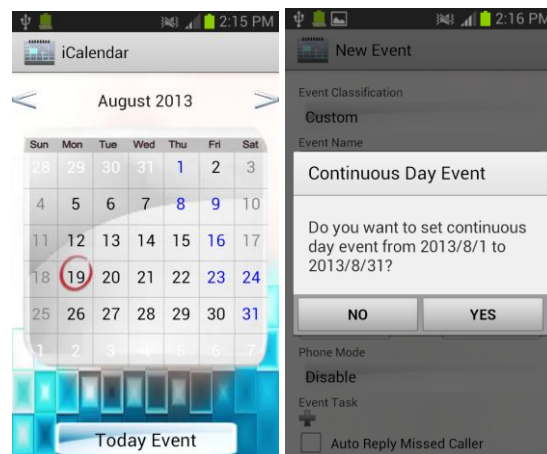
Figure 4-2-3-3-F2 Add Event Form II

Once users swipe on multiple days for 3 seconds, a form to add event will be displayed with an alert dialog, as shown in Figure 4-2-3-3-F2.
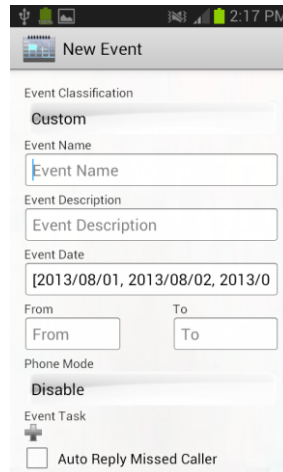
Figure 4-2-3-3-F3 Add Event Form III

Once users want to add continuous day event, a form to add event will be displayed, as shown in Figure 4-2-3-3-F3.
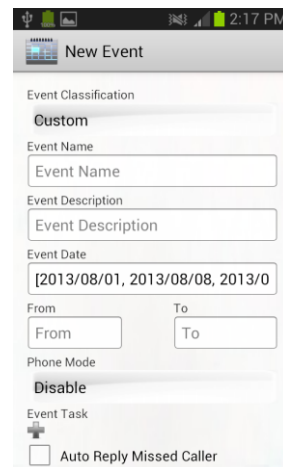
Figure 4-2-3-3-F4 Add Event Form IV

If users do not want to add continuous day event, a form to add event will be displayed, as shown in Figure 4-2-3-3-F4. The event will only insert the day which touched by user.
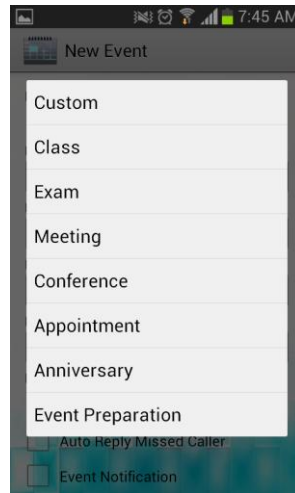
Figure 4-2-3-3-F5 Select Event Classification View

Once users tap the "Event Classification" spinner, an interface with classification list will be displayed, as shown in Figure 4-2-3-3-F5.
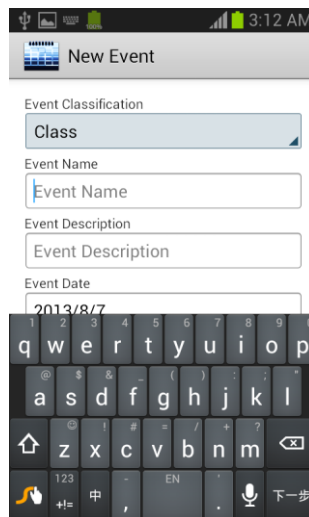
Figure 4-2-3-3-F6 Fill in Event Name View

Once users tap the text box of "Event Name" or "Event Description", an interface with soft keyboard will be displayed, as shown in Figure 4-2-3-3-F6.
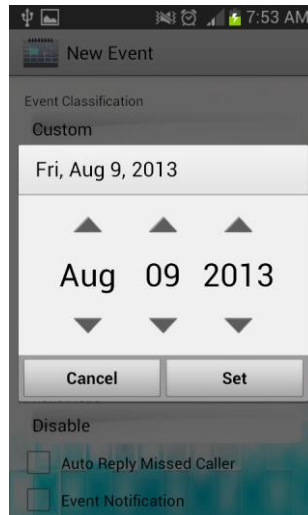
Figure 4-2-3-3-F7 Fill in Event Date View

Once users tap the text box of date, an interface with Date Picker will be displayed, as shown in Figure 4-2-3-3-F7.
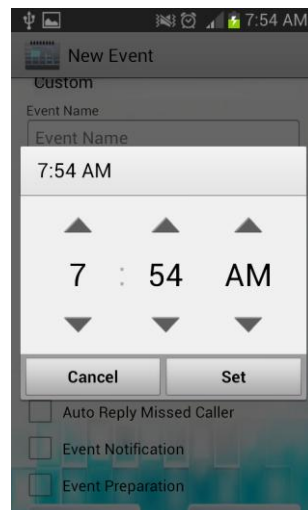
Figure 4-2-3-3-F8 Fill in Event Time View

Once users tap the text box of "From (event start time)" or "To (event end time)", an interface with Time Picker will be displayed, as shown in Figure 4-2-3-3-F8.
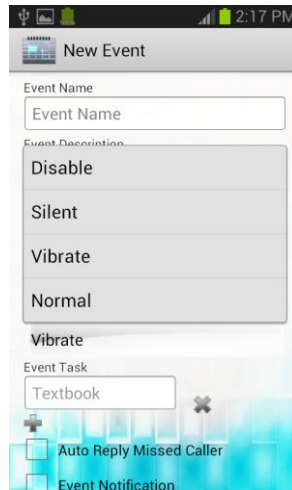
Figure 4-2-3-3-F9 Select Event Phone Mode View

Once users tap the event's "Phone Mode" spinner, an interface with phone mode list will be displayed, as shown in Figure 4-2-3-3-F9.
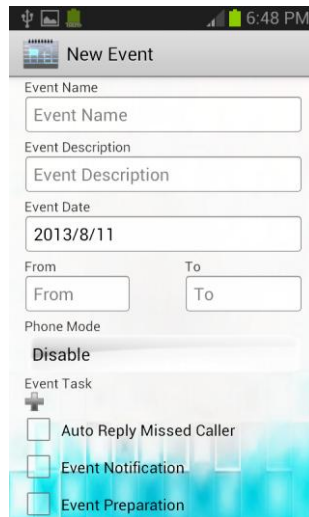
Figure 4-2-3-3-F10 Add Event Subtask View I

If users want to add event task, they will need to tap on the plus sign below the "Event Task", as shown in Figure 4-2-3-3-F10.
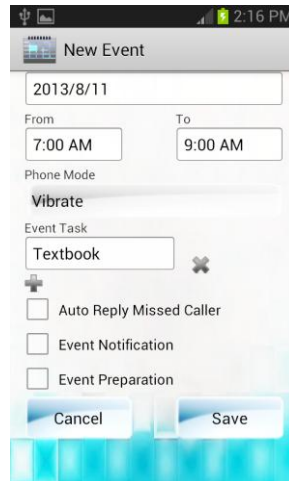
Figure 4-2-3-3-F11 Add Event Subtask View II

Once users tap on the plus sign, a text field will be displayed for users to input the event task, as shown in Figure 4-2-3-3-F11.
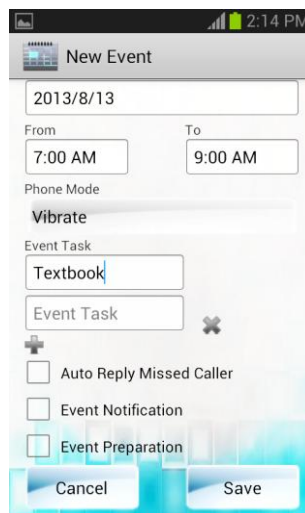
Figure 4-2-3-3-F12 Add Event Subtask View III

Once users tap on the plus sign again, another text field will be displayed for users to add more than one event task, as shown in Figure 4-2-3-3-F12.
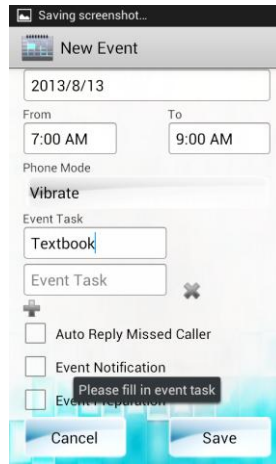
Figure 4-2-3-3-F13 Add Event Subtask View IV

If users leave either one of the event task text field in blank, when tap on save an alert box will be pops up, as shown in Figure 4-2-3-3-F13.
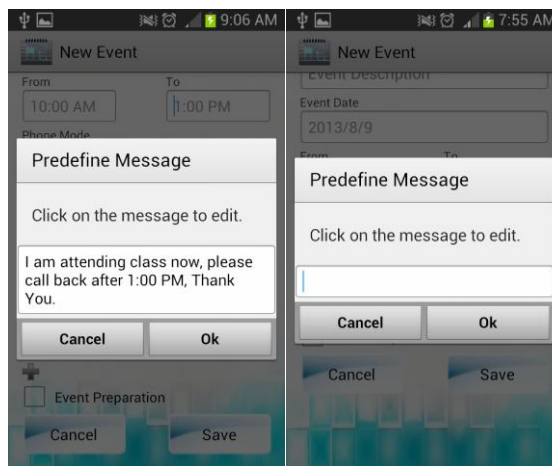
Figure 4-2-3-3-F14 Automatic Reply SMS View

Once users tick on the "Auto Reply Missed Caller", a predefine message box will be displayed, users may clear the predefine message and set user's own message, as shown in Figure 4-2-3-3-F14.
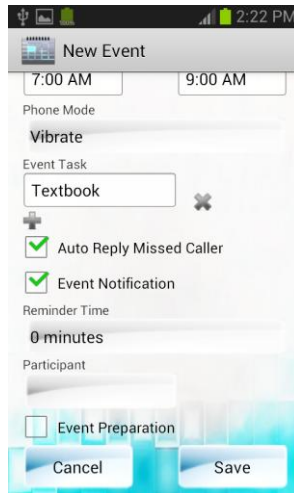
Figure 4-2-3-3-F15 Enable Event Notification View

Once users tick on the "Event Notification", "Reminder Time" and "Participant" option will be displayed, as shown in Figure 4-2-3-3-F15.
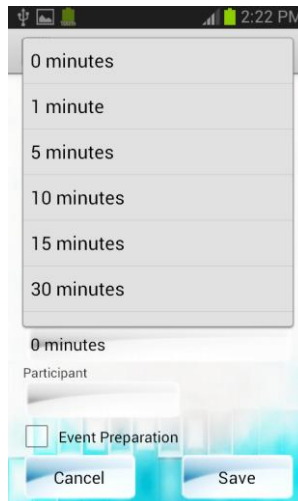
Figure 4-2-3-3-F16 Select Time to Remind View

Once users tap on the time field, an interface with time selection list will be displayed, as shown in Figure 4-2-3-3-F16.
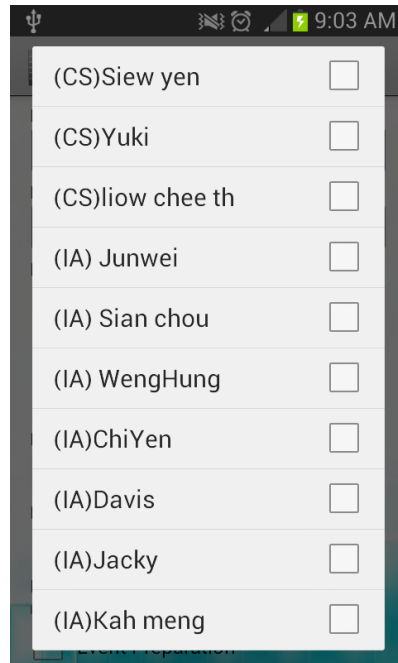
Figure 4-2-3-3-F17 Select Event Participant View

Once users tap on the blank field below the "Participant", an interface with multi-selection list of contacts will be displayed, as shown in Figure 4-2-3-3-F17.

4-2-3-4 Event Reminder View

Figure 4-2-3-4-F1 Reminder Home Screen View

Once reminder trigger on-time, a small triangle icon with exclamation mark will be displayed in notification bar, as shown in Figure 4-2-3-4-F1.
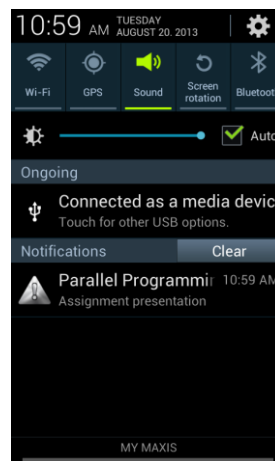
Figure 4-2-3-4-F2 Reminder Notification View

Once swipe down the notification bar, title and description of event will be displayed, as shown in Figure 4-2-3-4-F2.
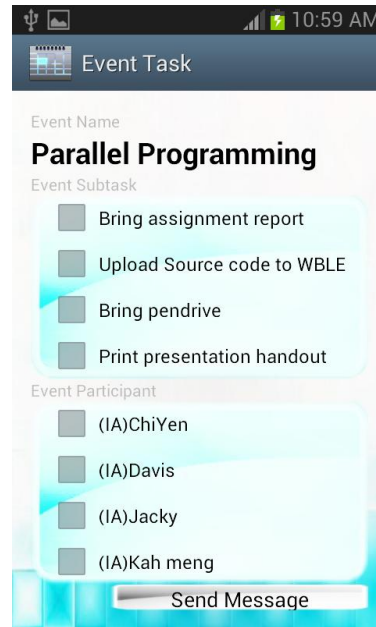
Figure 4-2-3-4-F3 Event Subtasks View

Once users tap on the occur event, an added event task with check box will be
displayed, as shown in Figure 4-2-3-4-F3.

4-2-3-5 Event Notification View

Figure 4-2-3-5-F1 Event Notification Home Screen View

Once event occur on-time, a small calendar icon will be displayed in notification bar, as shown in Figure 4-2-3-5-F1.
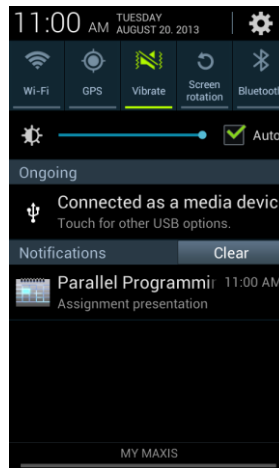
Figure 4-2-3-5-F2 Event Notification View

Once swipe down the notification bar, title and description of event will be displayed, as shown in Figure 4-2-3-5-F2.

4-2-3-6 Auto-remind Participant View
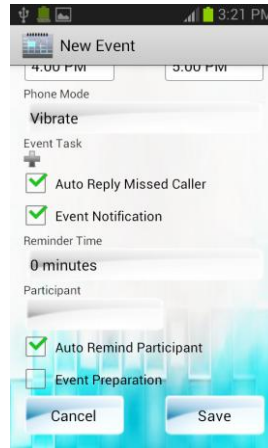
Figure 4-2-3-6-F1 Enable Auto Remind Event Participant View I

If users want to send short message service notification to the event's participant, users may tick on the "Auto Remind Participant", as shown in Figure 4-2-3-6-F1.
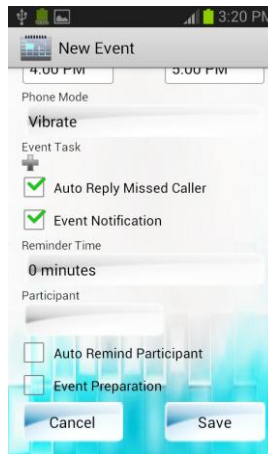
Figure 4-2-3-6-F2 Enable Auto Remind Event Participant View II

If users not prefer to send short message service notification to the event's participant, users may leave the check box blank, as shown in Figure 4-2-3-6-F2.

Figure 4-2-3-6-F3 Edit Auto Remind Event Participant Predefine Message View

Once users tick the check box, an interface with predefine message will be displayed, users may edit their own message, as shown in Figure 4-2-3-6-F3.
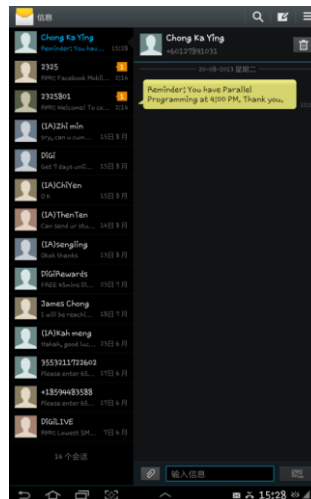
Figure 4-2-3-6-F4 SMS Remind Event Participant View

Once the reminder trigger, the event's participants will receive a short message service, as shown in Figure 4-2-3-6-F4.

4-2-3-7 Auto-reply SMS View
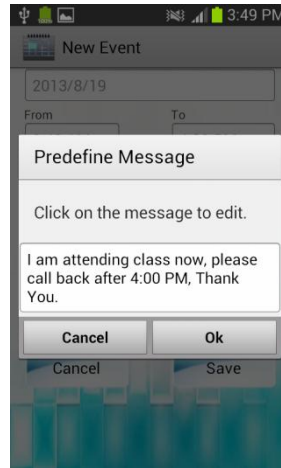
Figure 4-2-3-7-F1 SMS Reply Missed Caller View I
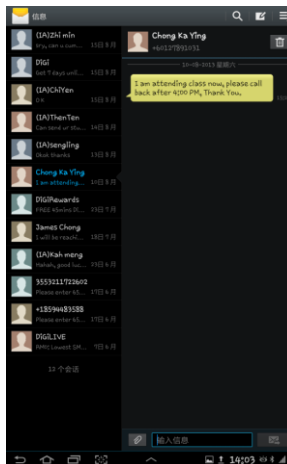
Figure 4-2-3-7-F2 SMS Reply Missed Caller View II

If callers call users during the event, caller will receive a short message service, as shown in Figure 4-2-3-7-F1.

4-2-3-8 Event Validation View
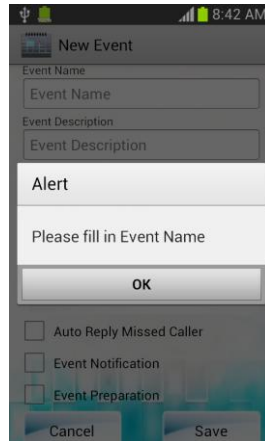
Figure 4-2-3-8-F1 Validation Alert View I

If users do not fill in the event's name, when tap to save an alert dialog will be pops up, as shown in Figure 4-2-3-8-F1.
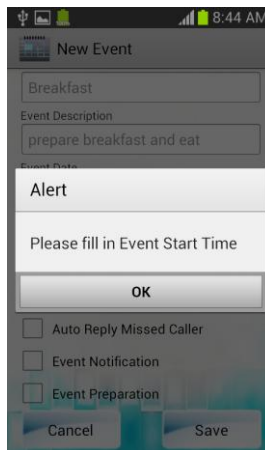
Figure 4-2-3-8-F2 Validation Alert View II

If users do not fill in the event's start time, when tap to save an alert dialog will be pops up, as shown in Figure 4-2-3-8-F2.
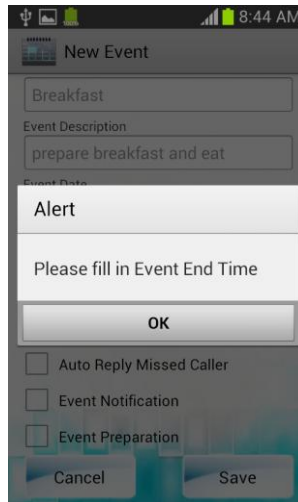
Figure 4-2-3-8-F3 Validation Alert View III

If users do not fill in the event's end time, when tap to save an alert dialog will be pops up, as shown in Figure 4-2-3-8-F3.
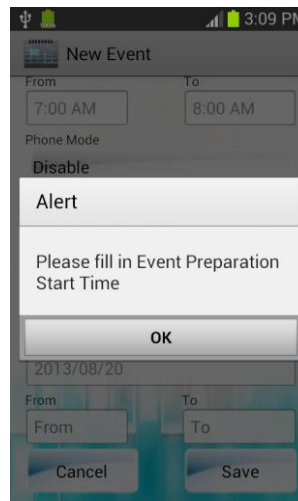
Figure 4-2-3-8-F4 Validation Alert View IV

If users do not fill in the event preparation's start time, when tap to save an alert dialog will be pops up, as shown in Figure 4-2-3-8-F4.
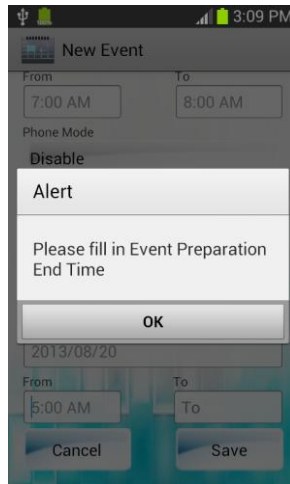
Figure 4-2-3-8-F5 Validation Alert View V

If users do not fill in the event preparation's end time, when tap to save an alert dialog will be pops up, as shown in Figure 4-2-3-8-F5.
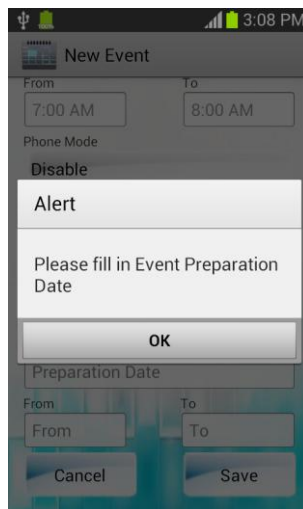
Figure 4-2-3-8-F6 Validation Alert View VI

If users do not fill in the event preparation's date, when tap to save an alert dialog will be pops up, as shown in Figure 4-2-3-8-F6.

4-3 Verification Plan

Black box testing method is use for verification plan. Black box testing is focus on the functional requirements which only test the functionality of an application or a system, but will not test its internal structures. For black box testing, the tester will not require examining the programming code of the system and unnecessary to has any knowledge about the program other than its specifications. For example, the tester only knows the inputs and what the expected outputs should be, instead of knowing how the programs generate those outputs. Tester will tests the application to check if it's perform or behave as expected using black box testing. Tester will test the application by performing a simple action such as touch a button, swipe view, long touch on view or a drop down menu spinner and observe whether the application performing as what tester expected.

Next, tester will perform testing on the functionalities part using black box testing. Tester will test on when add event to the program, can it be added to the program database and shown in the events list with the match of data from inputs. Tester will test on when delete the events, can it be remove from the database and the events list. Besides that, tester also will perform testing by simulate the situation with the pre-set event classification, when tester add the event by using all kinds of the pre-set event classification, does the program react or perform required actions during the events occur. Among the actions are, does the notification shows on time, does the phone mode successfully switch automatically and switch back to normal mode when events end, does the automated SMS to the missed caller able to receive by another users devices and does the events notification SMS able to receive by the events participants' s devices.

For additional, tester will test can event subtasks be saved when input data to the event subtasks list. Furthermore, tester will test when add or remove the additional

event subtasks, can it be successfully perform. Lastly, tester will test when edit or update the saved events, can it be saved without error.

CHAPTER 5 IMPLEMENTATION AND TESTING

5-1 System Implementation

In order to implement this project, there are two main user permission required. The permissions code as follow:

```
<uses-permission android:name="android.permission.READ_CALENDAR" />
<uses-permission android:name="android.permission.WRITE_CALENDAR" />
```

5-1-1 Implementation of the Event Classification Process

In order to classified the event to bring convenience to user, the selection of phone mode if by default. Besides that, it allows user personalization with provided "Custom" classification. The event classification code as follows:

```
spEventClassification = (Spinner)
findViewById(R.id.spinnerEventClassification);

spEventClassification.setOnItemSelectedListener(new OnItemSelectedListener(){
        @Override
        public void onItemSelected(AdapterView<?> arg0, View arg1,
                int pos, long arg3) {
        eventClassification = arg0.getItemAtPosition(pos).toString();
        if (arg0.getItemAtPosition(pos).toString().equals("Class")){
                spMode.setClickable(false);
                spMode.setSelection(2);                         }
        else if (arg0.getItemAtPosition(pos).toString().equals("Exam")){
                spMode.setClickable(false);
                spMode.setSelection(1);}
        else if (arg0.getItemAtPosition(pos).toString().equals("Meeting")){
                spMode.setClickable(false);
                spMode.setSelection(2);                         }
        else if (arg0.getItemAtPosition(pos).toString().equals("Conference")){
                spMode.setClickable(false);
                spMode.setSelection(1);}
        else if (arg0.getItemAtPosition(pos).toString().equals("Appointment")){
                spMode.setClickable(false);
                spMode.setSelection(3);}
```

```
        else{
                spMode.setClickable(true);}
        }
        @Override
        public void onNothingSelected(AdapterView<?> arg0) {
        // TODO Auto-generated method stub
        }
        });
```

5-1-2 Implementation of the Switch Phone Mode Service Process

The event phone mode code as follows:

```
spMode = (Spinner) findViewById(R.id.spinnerPhoneMode);
spMode.setOnItemSelectedListener(new OnItemSelectedListener(){
@Override
public void onItemSelected(AdapterView<?> arg0, View arg1,
            int pos, long arg3) {
        PHONE_MODE = arg0.getItemAtPosition(pos).toString();
        if (arg0.getItemAtPosition(pos).toString().equals("Disable")){
                //Do nothing}
        else{
                AlertDialog.Builder builder = new
                AlertDialog.Builder(arg0.getContext());
                builder.setTitle("Alert");
                builder.setMessage("Your device will be switch to "
          + arg0.getItemAtPosition(pos).toString()+" mode during the event.");
                builder.setPositiveButton("Ok", new
                DialogInterface.OnClickListener() {
                 @Override
                 public void onClick(DialogInterface dialog, int whichButton) {
                   return;}
                });
                builder.setNegativeButton("Cancel", new
                DialogInterface.OnClickListener() {
                 public void onClick(DialogInterface dialog, int which) {
                   return;}
                });
                AlertDialog alert = builder.create();
                 alert.show();
        }
        }
        @Override
        Public void onNothingSelected(AdapterView<?> arg0) {}
});
```

The switch event phone mode service and broadcast receiver in android manifest as follows:

```
<service android:name="com.project.icalendar.NotifierService"></service>
<receiver android:name="com.project.icalendar.CRT"></receiver>
```

Alarm manager wake up the phone and broadcast the message if users enable the auto phone mode switching service at event start time. Use pending intent to broadcast the message and use a receiver to catch the message to the service.

```
final Intent chartNotifier = new Intent(AddEvent.this,CRT.class);
        chartNotifier.putExtra("phone_mode", PHONE_MODE);
        chartNotifier.putExtra("event_name", EVENT_NAME);
        chartNotifier.putExtra("event_des", EVENT_DES);
        chartNotifier.putExtra("notify_id", NOTIFY_ID);
        chartNotifier.putExtra("end_time", END_TIME);

        PendingIntent pendingIntent =
        PendingIntent.getBroadcast(AddEvent.this,NOTIFY_ID,chartNotifier,0);
        //set event start time
        Calendar startService = Calendar.getInstance();
        startService.set(Calendar.YEAR, nyear);
        startService.set(Calendar.MONTH, (nmonth-1));
        startService.set(Calendar.DAY_OF_MONTH, nday);
        startService.set(Calendar.HOUR_OF_DAY, fhour);
        startService.set(Calendar.MINUTE, fminute);
        startService.set(Calendar.SECOND, 0);
        long START_TIME =startService.getTimeInMillis();

    AlarmManager alarmManager = (AlarmManager) getSystemService(ALARM_SERVICE);
    alarmManager.set(AlarmManager.RTC_WAKEUP, START_TIME, pendingIntent);
```

In change phone mode code as follows:

```java
public void onStart(Intent intent, int startId) {
    // TODO Auto-generated method stub
    super.onStart(intent, startId);
    Intent service = new Intent(this, NotificationService.class);
    stopService(service);
    PHONE_MODE = intent.getStringExtra("phone_mode");
      EVENT_NAME = intent.getStringExtra("event_name");
      EVENT_DES = intent.getStringExtra("event_des");
      NOTIFY_ID = intent.getIntExtra("notify_id", 0);
      EVENT_START_TIME = intent.getStringExtra("start_time");

      AudioManager am;
      am= (AudioManager)
      getBaseContext().getSystemService(Context.AUDIO_SERVICE);

      if(PHONE_MODE.equals("Normal")){
      //For Normal mode
      am.setRingerMode(AudioManager.RINGER_MODE_NORMAL);
      }
      else if(PHONE_MODE.equals("Silent")){
      //For Silent mode
      am.setRingerMode(AudioManager.RINGER_MODE_SILENT);
      }
      else if(PHONE_MODE.equals("Vibrate"))
      //For Vibrate mode
      am.setRingerMode(AudioManager.RINGER_MODE_VIBRATE);

    String ns = Context.NOTIFICATION_SERVICE;
    NotificationManager notificationManager = (NotificationManager)
      NotifierService.this
          .getSystemService(ns);

    long when = System.currentTimeMillis();
    Notification notification =
      new Notification(R.drawable.icon, EVENT_NAME, when);
    //cancel when click on the notification
    notification.flags |= Notification.FLAG_INSISTENT
          | Notification.FLAG_AUTO_CANCEL;

    Intent enterPnr = new Intent(NotifierService.this, CalendarActivity.class);
```

```java
    enterPnr.addFlags(Intent.FLAG_ACTIVITY_CLEAR_TOP);

    PendingIntent enterIntent = PendingIntent.getActivity(
            NotifierService.this, 0, enterPnr, 0);
    notification.setLatestEventInfo(NotifierService.this,
        EVENT_NAME,EVENT_DES        ,enterIntent);
    notificationManager.notify(NOTIFY_ID, notification);
}
```

5-1-3 Implementation of the Notification Service Process

Alarm manager is not a user notification system but an event for the phone to wake up notification at a certain time. Notifications are use to notify the user of an event. Broadcast Receiver is use to capture the alarm manager events and start a notification.

In order to allow the project application to provide Notification Service, the service and broadcast receiver are required.

```xml
<service android:name="com.project.icalendar.NotificationService" ></service>
<receiver android:name="com.project.icalendar.CRTNotification" ></receiver>
```

The following are the code to implement the reminder time.

```java
spReminderTime = (Spinner) findViewById(R.id.spinnerReminderTime);
spReminderTime.setOnItemSelectedListener(new OnItemSelectedListener(){
@Override
public void onItemSelected(AdapterView<?> arg0, View arg1,int pos, long arg3) {
if (arg0.getItemAtPosition(pos).toString().equals("0 minutes")){
        reminderTime =notificationService.getTimeInMillis();
}
else if (arg0.getItemAtPosition(pos).toString().equals("1 minute")){
        notificationService.add(Calendar.MINUTE, -1);
}
else if (arg0.getItemAtPosition(pos).toString().equals("5 minutes")){
        notificationService.add(Calendar.MINUTE, -5);
}
```

```java
else if (arg0.getItemAtPosition(pos).toString().equals("10 minutes")){
      notificationService.add(Calendar.MINUTE, -10);
}
else if (arg0.getItemAtPosition(pos).toString().equals("15 minute")){
      notificationService.add(Calendar.MINUTE, -15);
}
else if (arg0.getItemAtPosition(pos).toString().equals("30 minutes")){
      notificationService.add(Calendar.MINUTE, -30);
}
else if (arg0.getItemAtPosition(pos).toString().equals("45 minutes")){
      notificationService.add(Calendar.MINUTE, -45);
}
else if (arg0.getItemAtPosition(pos).toString().equals("1 hour")){
      notificationService.add(Calendar.HOUR_OF_DAY, -1);
}
else if (arg0.getItemAtPosition(pos).toString().equals("2 hours")){
      notificationService.add(Calendar.HOUR_OF_DAY, -2);
}
else if (arg0.getItemAtPosition(pos).toString().equals("12 hours")){
      notificationService.add(Calendar.HOUR_OF_DAY, -12);
}
else if (arg0.getItemAtPosition(pos).toString().equals("1 day")){
      notificationService.add(Calendar.DAY_OF_MONTH, -1);
}
else if (arg0.getItemAtPosition(pos).toString().equals("2 days")){
      notificationService.add(Calendar.DAY_OF_MONTH, -2);
}
else if (arg0.getItemAtPosition(pos).toString().equals("1 week")){
          notificationService.add(Calendar.DAY_OF_MONTH, -7);
      }
}
@Override
public void onNothingSelected(AdapterView<?> arg0) {
      // TODO Auto-generated method stub
      }
});
```

5-1-4 Implementation of the Event Participant Process

In order to retrieve contact name and contact number from user phone book, there is permission are required.

```
<uses-permission android:name="android.permission.READ_CONTACTS" />
```

The following are the code to retrieve contact from phone book.

```java
ArrayList<String> myArr = new ArrayList<String>();
spParticipant = (MultiSelectSpinner)findViewById(R.id.spinnerParticipant);
spParticipant.setItems(myArr);
final String[] projection = new String[] {
            ContactsContract.Contacts._ID,
            ContactsContract.Contacts.DISPLAY_NAME,
            ContactsContract.Contacts.HAS_PHONE_NUMBER
        };
String selection = ContactsContract.Contacts.HAS_PHONE_NUMBER + "='1'";
ContentResolver cr = getContentResolver();
Cursor cur = cr.query(ContactsContract.Contacts.CONTENT_URI, projection,
selection, null, ContactsContract.Contacts.DISPLAY_NAME + " ASC");
if (cur.getCount() > 0)
{
    while (cur.moveToNext()) {
    String idc =
      cur.getString(cur.getColumnIndex(ContactsContract.Contacts._ID));
    String namec =
      cur.getString(cur.getColumnIndex(ContactsContract.Contacts.DISPLAY_NAME));
    myArr.add(namec);
    }
}
```

The following are the code to retrieve contact number for selected participant.

```java
List<String> p_name = spParticipant.getSelectedStrings();
for(String str : p_name){
Toast.makeText(getApplication(), "" + str,Toast.LENGTH_LONG).show();
ContentResolver cr1 = getContentResolver();
Cursor cur1 = cr1.query(ContactsContract.Contacts.CONTENT_URI,null,null, null,
null);
if (cur1.getCount() > 0) {

while (cur1.moveToNext()) {

String id =
cur1.getString(cur1.getColumnIndex(ContactsContract.Contacts._ID));
String name =
cur1.getString(cur1.getColumnIndex(ContactsContract.Contacts.DISPLAY_NAME));

if(str.equals(name)){

if (Integer.parseInt(cur1
.getString(cur1.getColumnIndex(ContactsContract
.Contacts.HAS_PHONE_NUMBER))) > 0)
 {
Cursor pCur = cr1.query(
ContactsContract.CommonDataKinds.Phone.CONTENT_URI,
new String[]{ContactsContract.CommonDataKinds.Phone.NUMBER},
ContactsContract.CommonDataKinds.Phone.CONTACT_ID +" = ?",
 new String[]{id}, null);

while (pCur.moveToNext()) {

for(int j=0;j<pCur.getColumnCount();j++)
phoneNumber = pCur.getString(j);

}
pCur.close();
Toast.makeText(getApplication(), "" + phoneNumber,Toast.LENGTH_SHORT).show();
mysqLiteAdapter.openToWrite();
mysqLiteAdapter.insertParticipant(str,phoneNumber,String.valueOf(NOTIFY_ID));
}
}
}
}
}
```

In order to save the participant name and contact number, SQLiteAdapter is use to create a new table, insert participant info and to display the participant.

Part of code to create table and insert participant information is as follow:

```java
public final String SCRIPT_CREATE_TABLE_PARTICIPANT = "create table "
                    + MYDATABASE_TABLE_PARTICIPANT
                    + " ( _id INTEGER PRIMARY KEY AUTOINCREMENT,"
                    + KEY_CONTENT_PARTICIPANT_NAME + " text not null, "
                    + KEY_CONTENT_PARTICIPANT_CONTACT_NUMBER
                    + "  text not null, "
                    + KEY_CONTENT_PARTICIPANT_EVENT_ID + " text not null);";
public long insertParticipant (String participantName, String
participantNumber, String eventId){
  ContentValues contentValues = new ContentValues();
  //Insert contact name
  contentValues.put(KEY_CONTENT_PARTICIPANT_NAME, participantName);
  //Insert contact number
  contentValues.put(KEY_CONTENT_PARTICIPANT_CONTACT_NUMBER, participantNumber);
  //Insert event ID
  contentValues.put(KEY_CONTENT_PARTICIPANT_EVENT_ID, eventId);
  return sqLiteDatabase.insert(MYDATABASE_TABLE_PARTICIPANT, null,
      contentValues);}
```

Part of code to update table participant and queue participant information is as follow:

```java
public void updateParticipant(long id, String participantName, String
participantNumber, String eventId){
  ContentValues args = new ContentValues();
  args.put(KEY_CONTENT_PARTICIPANT_NAME, participantName);
  args.put(KEY_CONTENT_PARTICIPANT_CONTACT_NUMBER, participantNumber);
  args.put(KEY_CONTENT_PARTICIPANT_EVENT_ID, eventId); //Insert event ID
  sqLiteDatabase.update(MYDATABASE_TABLE_PARTICIPANT, args, ROW_ID + "=" + id,
  null);}
public Cursor queueParticipant(String eventId){
  String[] columns = new String[]
  { ROW_ID, KEY_CONTENT_PARTICIPANT_NAME
  ,KEY_CONTENT_PARTICIPANT_CONTACT_NUMBER};
  Cursor cursor = sqLiteDatabase.query (MYDATABASE_TABLE,columns
  ,KEY_CONTENT_PARTICIPANT_EVENT_ID
  + "="+ eventId,null,null,null,null );
  return cursor;}
```

5-1-5 Implementation of the Auto-reply Short Message Service Process

In order to allow the project application to read phone state and send SMS, there are some permission are require.

```xml
<uses-permission android:name="android.permission.READ_CALL_LOG" />
<uses-permission android:name="android.permission.READ_PHONE_STATE" />
<uses-permission android:name="android.permission.WRITE_SMS" />
<uses-permission android:name="android.permission.SEND_SMS" />
```

Alarm manager wake up the phone and broadcast the message if users enable the auto reply service at event start time. Use pending intent to broadcast the message and use a receiver to catch the message to start auto reply service.

```java
if (cbAutoreply.isChecked()){
 final Intent Autoreply = new Intent(AddEvent.this,CRTSMSMisscaller.class);
 Autoreply.putExtra("notify_id", NOTIFY_ID);
 Autoreply.putExtra("misscallMessage", misscallMessage);
 PendingIntent smsIntent =
  PendingIntent.getBroadcast(AddEvent.this,NOTIFY_ID,Autoreply,0);
 AlarmManager SMSMisscallerAlarm = (AlarmManager)
  getSystemService(Context.ALARM_SERVICE);
 SMSMisscallerAlarm.set(AlarmManager.RTC_WAKEUP,START_TIME, smsIntent);
}
```

In order to allow the project application to provide Short Message Service, the service and broadcast receiver is required.

```xml
<service android:name="com.project.icalendar.SMSMisscallerService"></service>
<receiver android:name="com.project.icalendar.CRTSMSMisscaller"></receiver>
```

SmsManager is used to provide the function send SMS in a user defined function send SMS as follows:

```java
SmsManager smsManager = SmsManager.getDefault();
smsManager.sendTextMessage(incomingNumber,null, misscallMessage, null, null);
Log.i(APP_NAME, "Message send to "+ incomingNumber);
```

Broadcast receiver is used to capture the alarm manager events and start auto reply SMS to missed caller service. Following are the code of broadcast receiver.

```java
public class CRTSMSMisscaller extends BroadcastReceiver {
    private String misscallMessage;
    private int NOTIFY_ID;
    @Override
    public void onReceive(Context context, Intent intent) {
      NOTIFY_ID = intent.getIntExtra("notify_id", 0);
      misscallMessage = intent.getStringExtra("misscallMessage");
       // Call Service
       Intent service = new Intent(context, SMSMisscallerService.class);
       service.putExtra("notify_id", NOTIFY_ID);
       service.putExtra("misscallMessage", misscallMessage);
       context.startService(service); }
}
```

Telephony Manager is used to identify the phone call state. If the previous status is CALL_STATE_RINGING and current status is CALL_STATE_IDLE, it means the call is not answer by user. The service records the number of missed caller and reply with the preset message.

Part of source code is as below:

```java
    public void onStart(Intent intent, int startId) {
      super.onStart(intent, startId);
     misscallMessage = intent.getStringExtra("misscallMessage");
     startSignalLevelListener();}
    private void startSignalLevelListener() {
      tm = (TelephonyManager) getSystemService(TELEPHONY_SERVICE);
      int events = PhoneStateListener.LISTEN_CALL_STATE;
      tm.listen(phoneStateListener, events);}
```

```java
private PhoneStateListener phoneStateListener = new PhoneStateListener(){
            @Override
            public void onCallForwardingIndicatorChanged(boolean cfi)
            {
                    Log.i(APP_NAME, "onCallForwardingIndicatorChanged " + cfi);
                    super.onCallForwardingIndicatorChanged(cfi);
            }
            @Override
            public void onCallStateChanged(int state, String incomingNumber)
            {
                    String callState = "UNKNOWN";
                    int newPhoneState = 0;
                    switch(state)
                    {
                    case TelephonyManager.CALL_STATE_IDLE:
                        callState = "IDLE";
                        newPhoneState=TelephonyManager.CALL_STATE_IDLE;
                        break;
                    case TelephonyManager.CALL_STATE_RINGING:
                        callState = "Ringing (" + incomingNumber + ")";
                        newPhoneState=TelephonyManager.CALL_STATE_RINGING;
                        break;
                    case TelephonyManager.CALL_STATE_OFFHOOK:
                        callState = "Offhook";
                        newPhoneState=TelephonyManager.CALL_STATE_OFFHOOK;
                        break;
                    }
                    Log.i(APP_NAME, "onCallStateChanged " + callState);
            //if the previous state is 'ringing'
            if(lastKnownPhoneState ==TelephonyManager.CALL_STATE_RINGING){
              Log.i(APP_NAME, "phone ringing just now");
                if(newPhoneState == TelephonyManager.CALL_STATE_OFFHOOK) {
                    Log.i(APP_NAME, "phone answered ");
                }
                else if(newPhoneState == TelephonyManager.CALL_STATE_IDLE){
                    SmsManager smsManager = SmsManager.getDefault();
                      smsManager.sendTextMessage(incomingNumber,
                                null, misscallMessage, null, null);
                      Log.i(APP_NAME, "Message send to "+ incomingNumber);
                }
            }
            else{   Log.i(APP_NAME, "phone no ringing");}
            lastKnownPhoneState = newPhoneState;
            super.onCallStateChanged(state, incomingNumber);
             }
};
```

Alarm manager wake up the phone and broadcast the service terminator message at event end time to stop auto-reply service.

```java
@Override
public void onDestroy() {
        Log.i( "SMSMisscallerService","service end");
        tm.listen(phoneStateListener, PhoneStateListener.LISTEN_NONE);
        super.onDestroy();
}
```

5-1-6 Implementation of the Dragging over multiple dates on Date

Part of source code to add multiple day event or continuous day event is as below:

```java
if((set.size())>1){
     maxday = Collections.max(set);
     minday = Collections.min(set);
     AlertDialog.Builder builder = new AlertDialog.Builder(this);
     builder.setTitle("Continuous Day Event");
     builder.setMessage("Do you want to set continuous day event from "
     +String.valueOf(year)+"/"+String.valueOf(month)
     +"/"+String.valueOf(minday)
     +" to "+String.valueOf(year)+"/"+String.valueOf(month)
     +"/"+String.valueOf(maxday) +"?");
     builder.setCancelable(false);
     builder.setNegativeButton("NO", new DialogInterface.OnClickListener() {
     public void onClick(DialogInterface dialog, int which) {
     multipleDay = true;
     continuousDay = false;
     Iterator<Integer> iterator = set.iterator();
      while (iterator.hasNext()){
          String mdate = year + "/" + month + "/" + iterator.next();
          Date mDate = null;
                 String date;
                 date = mdate;
                 final SimpleDateFormat format = new
                       SimpleDateFormat("yyyy/MM/dd");
                 try {
                 mDate = format.parse(date);
                 } catch (java.text.ParseException e) {
                 // TODO Auto-generated catch block
                 e.printStackTrace();
                 }
                 SimpleDateFormat df = new SimpleDateFormat("yyyy/MM/dd");
                 date = df.format(mDate);
                 MULTIPLE_DAY.add(date);
      }dialog.cancel();
     DATE.setText(String.valueOf(MULTIPLE_DAY));
     }
});
```

In order to prompt user whether want the events add to the selected date only or from the earlier date until the latest date within the dragged trace in calendar. The part of source code is as below:

```java
builder.setPositiveButton ("YES", new DialogInterface.OnClickListener() {
public void onClick(DialogInterface dialog, int which){
        continuousDay = true;
        multipleDay = false;
        for (int i = minday ; i<=maxday ;i++) {
                String cdate = year + "/" + month + "/" + i;
                Date cDate = null;
                String date;
                date = cdate;
                final SimpleDateFormat format = new
                        SimpleDateFormat("yyyy/MM/dd");
                try {
                cDate = format.parse(date);
                } catch (java.text.ParseException e) {
                // TODO Auto-generated catch block
                e.printStackTrace();
                }
                SimpleDateFormat df = new SimpleDateFormat("yyyy/MM/dd");
                date = df.format(cDate);
            CONTINUOUS_DAY.add(date);
        }
    dialog.cancel();
    Toast.makeText(getApplicationContext(), "DAY
"+String.valueOf(CONTINUOUS_DAY),Toast.LENGTH_LONG).show();
        DATE.setText(String.valueOf(CONTINUOUS_DAY));

    }
});

AlertDialog alert = builder.create();
alert.show();
```

5-2 Testing Plan and Result

5-2-1 Calendar View Testing

Module or screen: Main Interface (application calendar)				
Objective: to verify the accuracy of menu option by tap on menu item, swipe on the item or press device button.				
Test Conditions	Description	Status	Test Result	
			Expected	Actual
1	• Tap on the iCalendar application icon.	valid	The splash screen animation will show out then launch the main interface.	The splash screens animations have shown then launch the main interface.
2	• Tap on the splash screen animation before it end.	valid	The splash screen animation will bypass and show out the main interface.	The splash screen animation bypassed and showed out the main interface.
3	• Tap on the left and right arrow button.	valid	The current calendar month will continuously show next month when tap on right arrow and continuously show previous month on left arrow.	The current calendar month continuously showed next month when tap on right arrow and continuously showed previous month on left arrow.
4	• Tap on a date in calendar.	valid	The selected date event will show out.	The selected date event showed out.
5	• Long press on a date in calendar.	valid	The "New Event" form will show out	The "New Event" form showed out and

			and current date will set on the "Event Date".	current date set on the "Event Date".
6	• Swipe up the "Today Event" menu.	valid	The current date events will show out.	The current date events showed out.
7	• Tap on an event in "Today Event" list.	valid	The "Delete Event" dialog will show out.	The "Delete Event" dialog has shown.
8	• Tap on the "No" button in the "Delete Event" menu.	valid	The "Delete Event" menu will be dismissed.	The "Delete Event" menu has dismissed.
9	• Tap on the "Yes" button in the "Delete Event" menu.	valid	The selected event will be deleted.	The selected event has deleted.
10	• Long press on an event in "Today Event" list.	valid	The "Update Event" interface will show out.	The "Update Event" interface has shown.
11	• Tap on the hard/soft menu button on device.	valid	The "Show Event" and "User Manual" list will show out.	The "Show Event" and "User Manual" list has shown.
12	• Tap on the "User Manual" button.	valid	The "User Manual" interface will show out.	The "User Manual" interface has shown.
13	• Tap on the "Show Event" button.	valid	The "All Events" view will show out.	The "All Events" view has shown.
14	• Tap on the hard/soft back button.	valid	The application will be close.	The application closed.

15	• Drag and long press on the selected dates on calendar.	valid	The "Continuous Day Event" alert box with "NO", "YES" button and the date selected will show out	The "Continuous Day Event" alert box with "NO", "YES" button and the date selected has shown.
16	• Tap on the "NO" button in the "Continuous Day Event" alert box.	valid	The "New Event" form with "Custom" as classification will show out and the "Event Date" will include the dragged selected date only.	The "New Event" form with "Custom" as classification has shown and the "Event Date" included the dragged selected date only.
17	• Tap on the "YES" button in the "Continuous Day Event" alert box.	valid	The "New Event" form with "Custom" as classification will show out and the "Event Date" will include every days begin with earlier date and end with the latest date in the dragged selected dates.	The "New Event" form with "Custom" as classification has shown and the "Event Date" included every days begin with earlier date and end with the latest date in the dragged selected dates.

5-2-2 Add Event Testing

	Module or screen: New Event (add event form)				
Objective: to verify the accuracy of menu option by tap on menu item, swipe on the item or press device button.					
Test Conditions	Description	Status	Test Result		
			Expected	Actual	
1	• One-by-one tap on the preset classifications in "Event Classification " drop down menu.	valid	The preset classification will able to select and phone mode selection will be unclick able if is changed	The preset classification able to select and phone mode selection will be unclick able if is changed	
2	• Use the "Custom" classification, tap on the "Event Name" field.	valid	The soft keyboard will show out for input.	The soft keyboard showed out for input.	
3	• Use the "Custom" classification, tap on the "Event Description" field.	valid	The soft keyboard will show out for input and will able to insert data	The soft keyboard showed out for input and able to insert data	
4	• Use the "Custom" classification, tap on the "Event Date" field.	valid	The scrollable date selection menu will show out with current date for input and will able to show the selected date after click on the "Done" button.	The scrollable date selection menu showed out with current date for input and able to show the selected date after click on the "Done" button.	
5	• Use the	valid	The scrollable	The scrollable	

			time selection menu will show out with current time for input and will able to show the selected time after click on the "Done" button.	time selection menu showed out with current time for input and able to show the selected time after click on the "Done" button.
6	• Use the "Custom" classification, tap on the "Phone Mode" field.	valid	The phone mode drop down menu will show out and will able to select on it	The phone mode drop down menu showed out and able to select on it.
7	• Use the "Custom" classification, tick on the "Auto Reply Missed Caller" checkbox.	valid	The "Predefine Message" form will show out and will able to input the text message.	The "Predefine Message" form shows out and able to input the text message.
8	• Use the "Custom" classification, tick on the "Event Notification" checkbox.	valid	The "Reminder Time" and "Participant" fields will show out.	The "Reminder Time" and "Participant" fields showed out.
9	• Tap on the "Reminder Time" field	valid	The drop down list with time selection will show out and will able to select on it.	The drop down list with time selection showed out and able to select on it.
10	• Tap on the "Participant"	valid	The device contact list will	The device contact list

	field		**show out in check list form and will able to select multiple contacts.**	**showed out in check list form and able to select multiple contacts.**
11	• **Use the "Custom" classification, tick on the "Event Preparation" checkbox.**	**valid**	**The "Preparation Date", "From" and "To" fields will show out.**	**The "Preparation Date", "From" and "To" fields showed out.**
12	• **Tap on the "Event Date" field.**	**valid**	**The scrollable date selection menu will show out with current date for input and will able to show the selected date after click on the "Done" button.**	**The scrollable date selection menu showed out with current date for input and able to show the selected date after click on the "Done" button.**
13	• **Tap on the "From" and "To" fields.**	**valid**	**The scrollable time selection menu will show out with current time for input and will able to show the selected time after click on the "Done" button.**	**The scrollable time selection menu showed out with current time for input and able to show the selected time after click on the "Done" button.**
14	• **Use the "Custom" classification, tap on the "Event**	**valid**	**The "Event subtasks" field will show out with the "Please fill in event**	**The "Event subtasks" field showed out with the "Please fill in event subtasks"**

			subtasks" message and will able to input the data.	message and able to input the data.
15	• Tap again on the "Event subtasks" plus sign button.	valid	Another "Event subtasks" field will show out with the "Please fill in event subtasks" message and will able to input the data.	The additional "Event subtasks" field showed out with the "Please fill in event subtasks" message and able to input the data.
16	• Tap on the "Event subtasks" cross sign button beside the added task.	valid	The added "Event subtasks" field will be removing.	The added "Event subtasks" field removed.
17	• Tap on the "CANCEL" button.	valid	The "New Event" form will be dismissed and back to main calendar view.	The "New Event" form dismissed and back to main calendar view.
18	• Tap on the "SAVE" button.	valid	The "New Event" forms inputs will be save and will able to view on the "All Events" view.	The "New Event" form inputs saved and able to view on the "All Events" view.
19	• Tap on the hard/soft menu button on device.	valid	The menu with "Home" and "View Event" selection will show out.	The menu with "Home" and "View Event" selection showed out.
20	• Tap on the	valid	The "New	The "New

			Expected	Actual
	"Home" selection.		**Event" form will be dismissed and back to main calendar view.**	**Event" form dismissed and back to main calendar view.**
21	• **Tap on the "View Event" selection.**	**valid**	**The "All Events" view will show out.**	**The "All Events" view showed out.**

5-2-4 Show Event Testing

Module or screen: All Event (show all added events)				
Objective: to verify the accuracy of menu option by tap on menu item, swipe on the item or press device button.				
Test Conditions	**Description**	**Status**	**Test Result**	
			Expected	**Actual**
1	• **Tap on a saved event in "All Events" view.**	**valid**	**The "Delete Event" alert box with "NO" and "YES" button will show out.**	**The "Delete Event" alert box with "NO" and "YES" button showed out.**
2	• **Tap on the "NO" button in the alert box.**	**valid**	**The alert box will dismiss and back to the "All Events" view.**	**The alert box dismissed and back to the "All Event" view.**
3	• **Tap on the "YES" button in the alert box.**	**valid**	**The selected event will be removing from the "All Events" view.**	**The selected event removed from the "All Events" view.**

5-2-5 Update Event Testing

	Module or screen: Edit Event (edit event form)				
	Objective: to verify the accuracy of menu option by tap on menu item, swipe on the item or press device button.				
Test Conditions	Description	Status	Test Result		
			Expected	Actual	
1	• One-by-one tap on the preset classifications in "Event Classification" drop down menu.	valid	The preset classification will able to select and phone mode selection will be unclick able if is changed	The preset classification able to select and phone mode selection will be unclick able if is changed	
2	• Tap on the "Event Name" field.	valid	The soft keyboard will show out for input.	The soft keyboard showed out for input.	
3	• Tap on the "Event Description" field.	valid	The soft keyboard will show out for input and will able to insert data	The soft keyboard showed out for input and able to insert data	
4	• Tap on the "Event Date" field.	valid	The scrollable date selection menu will show out with current date for input and will able to show the selected date after click on the "Done" button.	The scrollable date selection menu showed out with current date for input and able to show the selected date after click on the "Done" button.	
5	• Tap on the "From" and "To" fields.	valid	The scrollable time selection menu will show out with	The scrollable time selection menu showed out with current	

			current time for input and will able to show the selected time after click on the "Done" button.	time for input and able to show the selected time after click on the "Done" button.
6	• Tap on the "Phone Mode" field.	valid	The phone mode drop down menu will show out and will able to select on it	The phone mode drop down menu showed out and able to select on it.
7	• Tick on the "Auto Reply Missed Caller" checkbox.	valid	The "Predefine Message" form will show out and will able to input the text message.	The "Predefine Message" form shows out and able to input the text message.
8	• Tap on the "Event subtasks" plus sign button.	valid	The "Event subtasks" field will show out with the "Please fill in event subtasks" message and will able to input the data.	The "Event subtasks" field showed out with the "Please fill in event subtasks" message and able to input the data.
9	• Tap again on the "Event subtasks" plus sign button.	valid	Another "Event subtasks" field will show out with the "Please fill in event subtasks" message and will able to input the data.	The additional "Event subtasks" field showed out with the "Please fill in event subtasks" message and able to input the data.
10	• Tap on the "Event	valid	The added "Event	The added "Event

	subtasks" cross sign button beside the added task.		subtasks" field will be removing.	subtasks" field removed.

5-2-3 Event subtasks Testing

Module or screen: Event subtasks list (show the added event subtasks in an event)				
Objective: to verify the accuracy of menu option by tap on menu item, swipe on the item or press device button.				
Test Conditions	Description	Status	Test Result	
			Expected	Actual
1	• Tap on the reminder notification in device notification bar.	valid	The "Event subtasks" check list will show out.	The "Event subtasks" check list showed out.
2	• Tap to check the "Event subtasks" list check box.	valid	The check box will show a green tick.	The check box showed a green tick.

5-2-4 Event Participant Testing

Module or screen: Event Participant list (show the added event subtasks in an event)				
Objective: to verify the accuracy of menu option by tap on menu item, swipe on the item or press device button.				
Test Conditions	Description	Status	Test Result	
			Expected	Actual
1	• Tap on the reminder notification in device notification bar.	valid	The "Event Participant" check list will show out.	The "Event Participant" check list showed out.

2	• Tap to check the "Event Participant" list check box.	valid	The check box will show a green tick.	The check box showed a green tick.
3	• Top on "Send Message Button"	valid	The message will send to selected participant.	The message is send to selected participant.

CHAPTER 6 PROJECT REVIEW

5-1 Project Review

iCalendar is developed to improve the human daily life quality by provide more conveniences and ease of solution. iCalendar allow users to manage or plan their time properly and able to remind what the user has to do next. This application even comes with few unique automated features such as switch the phone mode automatically, send SMS notification by the application itself; these truly make user's life easier. Meanwhile, it even helps the user to manage their time by jotting down all events in the calendar therefore the user can easily plan their activities as well.

Technically iCalendar mobile application system is a mobile calendar application system which is developed to improve the convenient, ease of use, efficiency and effectiveness of the current available Android operating system's mobile calendar application. The problem statement in chapter one become the motivation in this project which aims to develop an enhanced features mobile calendar. The project developed to integrate the mobile calendar with few innovative and useful features. Among these features are customizable event classification, automated short message service reply based on event setting, intelligence phone mode switching and sub-features of add event, events preparation. Essentially, this project was developed by used the Eclipse as the developing software.

As conclusion, the project is aims to develop the system that able to utilize the time management of people nowadays. The features offered are fulfill the needs of people by developed the system referred to their requirement.

5-2 Future Work

May be included Semantic web in email system so that calendar can extract event information from the email and automatically update or insert into the calendar. Besides that, iCalendar may be implemented the synchronization service with Google Calendar in order to allow users access the calendar information no matter using which device. Public holiday shall be populated automatically in the calendar as a future improvement of this product. iCalendar may include a feature to export the events to CSV format file, hence provide convenience for users to make their own record.

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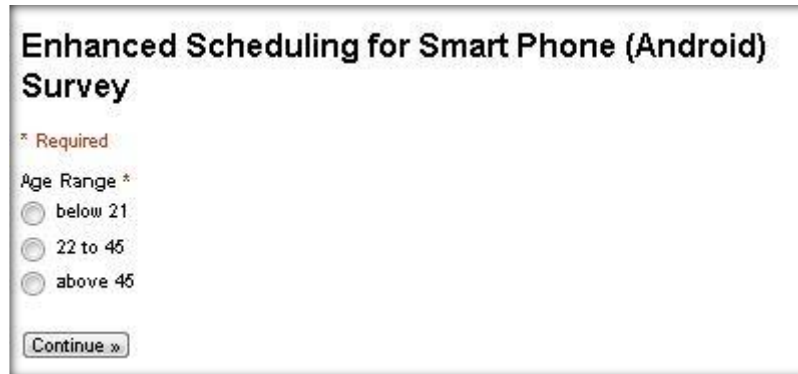
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APPENDICES A

Survey Form

Age Range Selection

Selected Age Below 21

Selected Age 22 to 45

Selected Age Above 45

Main Form1

Education Level Selection

Selected Primary or Secondary Education Level

Selected Undergraduate or Post-graduate Education Level

Importance of Public Holiday in Calendar

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I need the calendar to show the national public holiday.	○	○	○	○	○
I often arrange my daily event based on the public holiday.	○	○	○	○	○
It is useful if the calendar will suggest available time slot for my event preparation based on public holiday.	○	○	○	○	○

Importance of Automatically Reply Miss-caller

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I often miss out the phone call.	○	○	○	○	○
It is useful if my phone capable to send the miss-caller with predefined SMS.	○	○	○	○	○
The charge of SMS will not be expenses consideration.	○	○	○	○	○

Main Form 2

Importance of Notify Event Members

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I often organize the group event.	○	○	○	○	○
My event members always mess up or forgot the date and miss out the event.	○	○	○	○	○
It is useful if my phone can send notification SMS to the event member for the event preparation.	○	○	○	○	○
The charge of SMS will not be expenses consideration.	○	○	○	○	○

Importance of Changing Phone Mode(silent, vibrate, loud and etc)

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I often change the phone mode depend on the environment.	○	○	○	○	○
It is annoying to change the phone mode manually.	○	○	○	○	○
It is useful if my phone capable to switch the phone mode automatically.	○	○	○	○	○

Main Form 3

Main Form 4

Survey Results

Age Below 21

Age Range	Traditional Calendar [I frequent use the traditional calendar.]	Traditional Calendar [Traditional calendar is portable enough.]	Traditional Calendar [Traditional calendar provide privacy on my personal planning.]	Traditional Calendar [The public holiday stated in traditional calendar provide convenient for my event planning.]	Traditional Calendar [I will not miss out the plan which mark on traditional calendar frequently.]	Mobile Phone [I frequent use mobile phone.]	Mobile Phone [I often use mobile calendar application.]	Education Level
below 21	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Agree	Strongly Agree	Undergraduate
below 21	Strongly Disagree	Strongly Disagree	Strongly Disagree	Disagree	Strongly Disagree	Strongly Agree	Strongly Agree	Undergraduate
below 21	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Agree	Strongly Agree	Undergraduate
below 21	Strongly Disagree	Strongly Disagree	Strongly Disagree	Disagree	Strongly Disagree	Strongly Agree	Strongly Agree	Undergraduate
below 21	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Agree	Strongly Agree	Undergraduate
below 21	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Agree	Strongly Agree	Undergraduate
below 21	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Agree	Strongly Agree	Undergraduate
below 21	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Agree	Strongly Agree	Undergraduate
below 21	Strongly Disagree	Strongly Disagree	Strongly Disagree	Disagree	Strongly Disagree	Strongly Agree	Strongly Agree	Undergraduate
below 21	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Agree	Strongly Agree	Undergraduate
below 21	Strongly Agree	Disagree	Disagree	Strongly Agree	Disagree	Strongly Agree	Disagree	Secondary
below 21	Strongly Agree	Agree	Agree	Strongly Agree	Agree	Strongly Agree	Strongly Disagree	Secondary
below 21	Agree	Agree	Agree	Agree	Agree	Strongly Agree	Disagree	Secondary
below 21	Strongly Agree	Strongly Agree	Agree	Strongly Agree	Disagree	Strongly Agree	Disagree	Secondary
below 21	Strongly Agree	Strongly Agree	Agree	Strongly Agree	Agree	Strongly Agree	Strongly Disagree	Secondary
below 21	Agree	Agree	Agree	Strongly Agree	Agree	Agree	Strongly Disagree	Secondary
below 21	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Disagree	Strongly Agree	Disagree	Secondary
below 21	Agree	Agree	Disagree	Strongly Agree	Disagree	Strongly Agree	Disagree	Secondary
below 21	Strongly Agree	Strongly Agree	Agree	Strongly Agree	Disagree	Strongly Agree	Disagree	Secondary
below 21	Strongly Agree	Strongly Agree	Agree	Strongly Agree	Agree	Strongly Agree	Strongly Disagree	Secondary

Importance of Public Holiday in Calendar [I need the calendar to show the national public holiday.]	Importance of Public Holiday in Calendar [I often arrange my daily event based on the public holiday.]	Importance of Public Holiday in Calendar [It is useful if the calendar will suggest available time slot for my event preparation based on public holiday.]	Importance of Automatically Reply Miss-caller [I often miss out the phone call.]	Importance of Automatically Reply Miss-caller [It is useful if my phone capable to send the miss-caller with predefined SMS.]	Importance of Automatically Reply Miss-caller [The charge of SMS will not be expenses consideration.]	Importance of Notify Event Members [I often organize the group event.]	Importance of Notify Event Members [My event members always mess up or forgot the date and miss out the event.]	Importance of Notify Event Members [It is useful if my phone can send notification SMS to the event member for the event preparation.]
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Disagree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Disagree	Agree	Agree	Agree
Strongly Agree	Strongly Agree	Strongly Agree	Agree	Agree	Disagree	Agree	Agree	Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Disagree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Agree	Agree	Strongly Disagree	Agree	Agree	Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Disagree	Disagree	Disagree	Disagree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Disagree	Disagree	Disagree	Disagree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Disagree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Agree	Agree	Strongly Disagree	Agree	Agree	Agree
Strongly Agree	Strongly Agree	Strongly Agree	Agree	Agree	Strongly Disagree	Strongly Agree	Strongly Agree	Strongly Agree

Importance of Notify Event Members [The charge of SMS will not be expenses consideration.]	Importance of Changing Phone Mode(silent, vibrate, loud and etc) [I often change the phone mode depend on the environment.]	Importance of Changing Phone Mode(silent, vibrate, loud and etc) [It is annoying to change the phone mode manually.]	Importance of Changing Phone Mode(silent, vibrate, loud and etc) [It is useful if my phone capable to switch the phone mode automatically.]	Importance of Ease to Manage Calendar [I often have the continuous days event.]	Importance of Ease to Manage Calendar [It is difficult to manage the continuous days event by tapping on the calendar day by day.]	Importance of Ease to Manage Calendar [It is more efficient and easy if select the date by multi-touch selection on the calendar days.]	Importance of Public Holiday in Calendar [I need the calendar to show the national public holiday.]	Importance of Public Holiday in Calendar [I often arrange my daily event based on the public holiday.]
							Strongly Agree	Strongly Agree
							Strongly Agree	Strongly Agree
							Strongly Agree	Strongly Agree
							Strongly Agree	Strongly Agree
							Strongly Agree	Strongly Agree
							Strongly Agree	Strongly Agree
							Strongly Agree	Strongly Agree
							Strongly Agree	Strongly Agree
							Strongly Agree	Strongly Agree
							Strongly Agree	Strongly Agree
Strongly Disagree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree		
Strongly Disagree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree		
Disagree	Strongly Agree	Strongly Agree	Strongly Agree	Agree	Agree	Agree		
Strongly Disagree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree		
Strongly Disagree	Strongly Agree	Strongly Agree	Strongly Agree	Agree	Agree	Agree		
Strongly Disagree	Strongly Agree	Strongly Agree	Strongly Agree	Disagree	Disagree	Strongly Disagree		
Strongly Disagree	Strongly Agree	Strongly Agree	Strongly Agree	Disagree	Disagree	Disagree		
Disagree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree		
Strongly Disagree	Strongly Agree	Strongly Agree	Strongly Agree	Agree	Agree	Agree		
Strongly Disagree	Strongly Agree	Strongly Agree	Strongly Agree	Agree	Agree	Agree		

Importance of Public Holiday in Calendar [It is useful if the calendar will suggest available time slot for my event preparation based on public holiday.]	Importance of Automatically Reply Miss-caller [I often miss out the phone call.]	Importance of Automatically Reply Miss-caller [It is useful if my phone capable to send the miss-caller with predefined SMS.]	Importance of Automatically Reply Miss-caller [The charge of SMS will not be expenses consideration.]	Importance of Notify Event Members [I often organize the group event.]	Importance of Notify Event Members [My event members always mess up or forgot the date and miss out the event.]	Importance of Notify Event Members [It is useful if my phone can send notification SMS to the event member for the event preparation.]	Importance of Notify Event Members [The charge of SMS will not be expenses consideration.]	Importance of Changing Phone Mode(silent, vibrate, loud and etc) [I often change the phone mode depend on the environment.]
Strongly Agree	Strongly Agree	Strongly Agree	Disagree	Strongly Agree	Strongly Agree	Strongly Agree	Disagree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Disagree	Strongly Agree	Strongly Agree	Strongly Agree	Disagree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Disagree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Disagree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Disagree	Strongly Agree	Strongly Agree	Strongly Agree	Disagree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Disagree	Strongly Agree	Strongly Agree	Strongly Agree	Disagree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Disagree	Strongly Agree	Strongly Agree	Strongly Agree	Disagree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Disagree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Disagree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Disagree	Strongly Agree	Strongly Agree	Strongly Agree	Disagree	Strongly Agree
Strongly Agree		Strongly Agree	Disagree	Strongly Agree	Strongly Agree	Strongly Agree	Disagree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Disagree	Strongly Agree	Strongly Agree	Strongly Agree	Disagree	Strongly Agree

Importance of Changing Phone Mode(silent, vibrate, loud and etc) [It is annoying to change the phone mode manually.]	Importance of Changing Phone Mode(silent, vibrate, loud and etc) [It is useful if my phone capable to switch the phone mode automatically.]	Importance of Ease to Manage Calendar [I often have the continuous days event.]	Importance of Ease to Manage Calendar [It is difficult to manage the continuous days event by tapping on the calendar day by day.]	Importance of Ease to Manage Calendar [It is more efficient and easy if select the date by multi-touch selection on the calendar days.]
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree

Age 22 to 45

Age Range	Traditional Calendar [I frequent use the traditional calendar.]	Traditional Calendar [Traditional calendar is portable enough.]	Traditional Calendar [Traditional calendar provide privacy on my personal planning.]	Traditional Calendar [The public holiday stated in traditional calendar provide convenient for my event planning.]	Traditional Calendar [I will not miss out the plan which mark on traditional calendar frequently.]	Mobile Phone [I frequent use mobile phone.]	Mobile Phone [I often use mobile calendar application.]	Education Level
22 to 45	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Agree	Strongly Agree	Undergraduate
22 to 45	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Agree	Strongly Agree	Undergraduate
22 to 45	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Agree	Strongly Agree	Undergraduate
22 to 45	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Agree	Strongly Agree	Undergraduate
22 to 45	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Agree	Strongly Agree	Undergraduate
22 to 45	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Agree	Strongly Agree	Undergraduate
22 to 45	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Agree	Strongly Agree	Undergraduate
22 to 45	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Agree	Strongly Agree	Undergraduate
22 to 45	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Agree	Strongly Agree	Undergraduate
22 to 45	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Agree	Strongly Agree	Undergraduate
22 to 45	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Agree	Strongly Agree	Post-graduate
22 to 45	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Agree	Strongly Agree	Post-graduate
22 to 45	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Agree	Strongly Agree	Post-graduate
22 to 45	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Agree	Strongly Agree	Post-graduate
22 to 45	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Agree	Strongly Agree	Post-graduate
22 to 45	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Agree	Strongly Agree	Post-graduate
22 to 45	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Agree	Strongly Agree	Post-graduate
22 to 45	Disagree	Strongly Disagree	Strongly Disagree	Agree	Strongly Disagree	Agree	Agree	Secondary
22 to 45	Agree	Strongly Disagree	Strongly Disagree	Agree	Strongly Disagree	Agree	Disagree	Primary

Importance of Public Holiday in Calendar [I need the calendar to show the national public holiday.]	Importance of Public Holiday in Calendar [I often arrange my daily event based on the public holiday.]	Importance of Public Holiday in Calendar [It is useful if the calendar will suggest available time slot for my event preparation based on public holiday.]	Importance of Automatically Reply Miss-caller [I often miss out the phone call.]	Importance of Automatically Reply Miss-caller [It is useful if my phone capable to send the miss-caller with predefined SMS.]	Importance of Automatically Reply Miss-caller [The charge of SMS will not be expenses consideration.]	Importance of Notify Event Members [I often organize the group event.]	Importance of Notify Event Members [My event members always mess up or forgot the date and miss out the event.]	Importance of Notify Event Members [It is useful if my phone can send notification SMS to the event member for the event preparation.]
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Disagree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Disagree	Strongly Agree	Strongly Agree	Strongly Agree

Importance of Notify Event Members [The charge of SMS will not be expenses consideration.]	Importance of Changing Phone Mode(silent, vibrate, loud and etc) [I often change the phone mode depend on the environment.]	Importance of Changing Phone Mode(silent, vibrate, loud and etc) [It is annoying to change the phone mode manually.]	Importance of Changing Phone Mode(silent, vibrate, loud and etc) [It is useful if my phone capable to switch the phone mode automatically.]	Importance of Ease to Manage Calendar [I often have the continuous days event.]	Importance of Ease to Manage Calendar [It is difficult to manage the continuous days event by tapping on the calendar day by day.]	Importance of Ease to Manage Calendar [It is more efficient and easy if select the date by multi-touch selection on the calendar days.]	Importance of Public Holiday in Calendar [I need the calendar to show the national public holiday.]	Importance of Public Holiday in Calendar [I often arrange my daily event based on the public holiday.]
							Strongly Agree	Strongly Agree
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							Strongly Agree	Strongly Agree
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							Strongly Agree	Strongly Agree
							Strongly Agree	Strongly Agree
							Strongly Agree	Strongly Agree
							Strongly Agree	Strongly Agree
							Strongly Agree	Strongly Agree
Disagree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree		
Strongly Disagree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree		

Importance of Public Holiday in Calendar [It is useful if the calendar will suggest available time slot for my event preparation based on public holiday.]	Importance of Automatically Reply Miss-caller [I often miss out the phone call.]	Importance of Automatically Reply Miss-caller [It is useful if my phone capable to send the miss-caller with predefined SMS.]	Importance of Automatically Reply Miss-caller [The charge of SMS will not be expenses consideration.]	Importance of Notify Event Members [I often organize the group event.]	Importance of Notify Event Members [My event members always mess up or forgot the date and miss out the event.]	Importance of Notify Event Members [It is useful if my phone can send notification SMS to the event member for the event preparation.]	Importance of Notify Event Members [The charge of SMS will not be expenses consideration.]	Importance of Changing Phone Mode(silent, vibrate, loud and etc) [I often change the phone mode depend on the environment.]
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Agree	Strongly Agree	Strongly Agree	Strongly Agree	Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Agree	Strongly Agree	Strongly Agree	Strongly Agree	Agree	Strongly Agree
Strongly Agree	Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Agree	Strongly Agree	Strongly Agree	Strongly Agree	Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree

Importance of Changing Phone Mode(silent, vibrate, loud and etc) [It is annoying to change the phone mode manually.]	Importance of Changing Phone Mode(silent, vibrate, loud and etc) [It is useful if my phone capable to switch the phone mode automatically.]	Importance of Ease to Manage Calendar [I often have the continuous days event.]	Importance of Ease to Manage Calendar [It is difficult to manage the continuous days event by tapping on the calendar day by day.]	Importance of Ease to Manage Calendar [It is more efficient and easy if select the date by multi-touch selection on the calendar days.]
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree		Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree

Age Above 45

Age Range	Traditional Calendar [I frequent use the traditional calendar.]	Traditional Calendar [Traditional calendar is portable enough.]	Traditional Calendar [Traditional calendar provide privacy on my personal planning.]	Traditional Calendar [The public holiday stated in traditional calendar provide convenient for my event planning.]	Traditional Calendar [I will not miss out the plan which mark on traditional calendar frequently.]	Mobile Phone [I frequent use mobile phone.]	Mobile Phone [I often use mobile calendar application.]	Education Level
above 45	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Agree	Strongly Agree	Post-graduate
above 45	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Agree	Strongly Agree	Post-graduate
above 45	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Agree	Strongly Agree	Undergraduate
above 45	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Agree	Strongly Agree	Undergraduate
above 45	Agree	Disagree	Disagree	Strongly Agree	Disagree	Agree	Disagree	Secondary
above 45	Strongly Agree	Agree	Disagree	Strongly Agree	Disagree	Agree	Strongly Disagree	Secondary
above 45	Strongly Agree	Strongly Agree	Disagree	Strongly Agree	Disagree	Strongly Agree	Disagree	Secondary
above 45	Strongly Agree	Agree	Disagree	Strongly Agree	Disagree	Strongly Agree	Strongly Disagree	Secondary
above 45	Strongly Agree	Strongly Agree	Agree	Strongly Agree	Disagree	Agree	Strongly Disagree	Secondary
above 45	Strongly Agree	Strongly Agree	Agree	Strongly Agree	Agree	Agree	Strongly Disagree	Primary
above 45	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Agree	Strongly Disagree	Primary
above 45	Strongly Agree	Agree	Disagree	Strongly Agree	Disagree	Strongly Agree	Strongly Disagree	Primary
above 45	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Agree	Strongly Disagree	Primary
above 45	Strongly Agree	Strongly Agree	Agree	Strongly Agree	Agree	Agree	Strongly Disagree	Primary
above 45	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Disagree	Strongly Disagree	Primary
above 45	Strongly Agree	Agree	Agree	Strongly Agree	Agree	Agree	Strongly Disagree	Primary
above 45	Strongly Agree	Agree	Agree	Strongly Agree	Strongly Agree	Agree	Disagree	Primary
above 45	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Agree	Agree	Strongly Disagree	Primary
above 45	Strongly Agree	Agree	Agree	Strongly Agree	Agree	Strongly Agree	Strongly Disagree	Primary

Importance of Public Holiday in Calendar [I need the calendar to show the national public holiday.]	Importance of Public Holiday in Calendar [I often arrange my daily event based on the public holiday.]	Importance of Public Holiday in Calendar [It is useful if the calendar will suggest available time slot for my event preparation based on public holiday.]	Importance of Automatically Reply Miss-caller [I often miss out the phone call.]	Importance of Automatically Reply Miss-caller [It is useful if my phone capable to send the miss-caller with predefined SMS.]	Importance of Automatically Reply Miss-caller [The charge of SMS will not be expenses consideration.]	Importance of Notify Event Members [I often organize the group event.]	Importance of Notify Event Members [My event members always mess up or forgot the date and miss out the event.]	Importance of Notify Event Members [It is useful if my phone can send notification SMS to the event member for the event preparation.]
Strongly Agree	Strongly Agree	Strongly Agree	Agree	Strongly Agree	Strongly Disagree	Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Disagree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Agree	Agree	Strongly Disagree	Strongly Agree	Agree	Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Disagree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Agree	Agree	Strongly Disagree	Agree	Agree	Agree
Strongly Agree	Strongly Agree	Strongly Agree	Agree	Agree	Strongly Disagree	Disagree	Disagree	Disagree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Disagree	Disagree	Disagree	Disagree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Disagree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Disagree	Disagree	Strongly Disagree	Disagree	Disagree	Disagree
Strongly Agree	Strongly Agree	Strongly Agree	Disagree	Disagree	Strongly Disagree	Disagree	Disagree	Disagree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree
Strongly Agree	Strongly Agree	Strongly Agree	Agree	Agree	Strongly Disagree	Agree	Agree	Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Disagree	Disagree	Disagree	Disagree
Strongly Agree	Strongly Agree	Strongly Agree	Disagree	Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree
Strongly Agree	Strongly Agree	Strongly Agree	Agree	Agree	Strongly Disagree	Agree	Agree	Agree

Importance of Notify Event Members [The charge of SMS will not be expenses consideration.]	Importance of Changing Phone Mode(silent, vibrate, loud and etc) [I often change the phone mode depend on the environment.]	Importance of Changing Phone Mode(silent, vibrate, loud and etc) [It is annoying to change the phone mode manually.]	Importance of Changing Phone Mode(silent, vibrate, loud and etc) [It is useful if my phone capable to switch the phone mode automatically.]	Importance of Ease to Manage Calendar [I often have the continuous days event.]	Importance of Ease to Manage Calendar [It is difficult to manage the continuous days event by tapping on the calendar day by day.]	Importance of Ease to Manage Calendar [It is more efficient and easy if select the date by multi-touch selection on the calendar days.]	Importance of Public Holiday in Calendar [I need the calendar to show the national public holiday.]	Importance of Public Holiday in Calendar [I often arrange my daily event based on the public holiday.]
							Strongly Agree	Strongly Agree
							Strongly Agree	Strongly Agree
							Strongly Agree	Strongly Agree
							Strongly Agree	Strongly Agree
Strongly Disagree	Strongly Agree	Strongly Agree	Strongly Agree	Agree	Agree	Agree		
Strongly Disagree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree		
Disagree	Strongly Agree	Strongly Agree	Strongly Agree	Agree	Agree	Agree		
Disagree	Strongly Agree	Strongly Agree	Strongly Agree	Agree	Strongly Agree	Strongly Agree		
Strongly Disagree	Strongly Agree	Strongly Agree	Strongly Agree	Agree	Agree	Agree		
Strongly Disagree	Strongly Agree	Strongly Agree	Strongly Agree	Disagree	Neutral	Neutral		
Strongly Disagree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Disagree	Strongly Disagree	Strongly Disagree		
Strongly Disagree	Strongly Agree	Strongly Agree	Strongly Agree	Disagree	Disagree	Disagree		
Strongly Disagree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Disagree	Strongly Disagree	Strongly Disagree		
Strongly Disagree	Strongly Agree	Strongly Agree	Strongly Agree	Disagree	Disagree	Disagree		
Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree	Strongly Disagree		
Strongly Disagree	Strongly Agree	Strongly Agree	Strongly Agree	Agree	Agree	Agree		
Strongly Disagree	Strongly Agree	Strongly Agree	Strongly Agree	Disagree	Disagree	Disagree		
Strongly Disagree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Disagree	Strongly Disagree	Strongly Disagree		
Strongly Disagree	Strongly Agree	Strongly Agree	Strongly Agree	Agree	Agree	Agree		

Importance of Public Holiday in Calendar [It is useful if the calendar will suggest available time slot for my event preparation based on public holiday.]	Importance of Automatically Reply Miss-caller [I often miss out the phone call.]	Importance of Automatically Reply Miss-caller [It is useful if my phone capable to send the miss-caller with predefined SMS.]	Importance of Automatically Reply Miss-caller [The charge of SMS will not be expenses consideration.]	Importance of Notify Event Members [I often organize the group event.]	Importance of Notify Event Members [My event members always mess up or forgot the date and miss out the event.]	Importance of Notify Event Members [It is useful if my phone can send notification SMS to the event member for the event preparation.]	Importance of Notify Event Members [The charge of SMS will not be expenses consideration.]	Importance of Changing Phone Mode(silent, vibrate, loud and etc) [I often change the phone mode depend on the environment.]
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree

Importance of Changing Phone Mode(silent, vibrate, loud and etc) [It is annoying to change the phone mode manually.]	Importance of Changing Phone Mode(silent, vibrate, loud and etc) [It is useful if my phone capable to switch the phone mode automatically.]	Importance of Ease to Manage Calendar [I often have the continuous days event.]	Importance of Ease to Manage Calendar [It is difficult to manage the continuous days event by tapping on the calendar day by day.]	Importance of Ease to Manage Calendar [It is more efficient and easy if select the date by multi-touch selection on the calendar days.]
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree
Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree	Strongly Agree