

Mobile Application for Personal Journal/Diary

by

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ABSTRACT

For centuries, diary has been seen as a tool of learning and reflection. Many studies have shown that not only diary is an excellent tool to capture author's thoughts and life experiences but also yield significant health benefits such as coping with stress and depression. However, in recent years, changes in lifestyle and boom of technology cause the practice of diary writing to fall out of favour. The fact that people are facing health problems often associated with work stress and lack of focus as well as organization indicates the need to preserve the culture of diary writing. Introduction of smartphone to the world opens up the opportunity to incorporate diary writing in the form of mobile application. In this research, the author discusses on the importance and value of expressive writing in diary writing that makes it a valuable learning and reflection tool. The interest of this research is to develop a suitable diary mobile application that matches the current lifestyle and enhance the experience of diary writing on the go as people are spending more time on their smartphone than ever. The scope of the study will be on Android operating system and the development will undergo incremental and iterative development based on modern mobile application architecture.

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CHAPTER 1

INTRODUCTION

1.1 Background

For centuries, diaries have been seen as a tool of reflection and learning (Engin, 2011). It is “an ideal way to capture life lived by an individual over time as the diary author’s thoughts, both inner and outer events as well as observations that he or she experiences are fixed in a medium to provide a record of an ever-changing present” (Sheble & Windlemuth, 2009). Diaries are also labelled as self-report instruments used continuously to analyse on-going experiences, offer the opportunity to exploit social, psychological, and physiological processes, within everyday situations (Bolger, Davis & Rafaeli, 2002). There are various forms of writing about our own self, such as biography and letters, although are closely related to diary, but diaries are different in the sense that time structures their creation, layering text and objects into a chronological composite of snapshots and reflections a few minutes, a day or a week at a the time (Sheble & Wildemuth, 2009). Diaries are also known to assist authors to exercise their thinking skills scientifically through expressive writing as proven by studies conducted by Sá on primary school pupils in Portugal (2002). On more interesting note, expressive writing such as emotional experiences and creative brainstorming session causes significant physical and mental health improvements (Pennebaker, 1997). Although Adams (1999) argues that therapeutic potential of expressive writing was introduced in 1960s by Dr. Ira Progoff, a psychologist in New York City whom conducted workshops known as ‘Intensive Journal Method’, Dr. James W. Pennebaker was among the first few researchers that conducted proven studies on expressive writings on therapeutic processes and founded the basis of expressive writing paradigms in 1987. Since then, diaries have provide opportunities in the field of psychology with” a powerful set of methods for studying of methods for studying various human phenomena, including personality processes (e.g., Bolger & Zuckerman 1995, Fabes & Eisenberg 1997, Rhodewalt et al. 1998), marital and family interaction (e.g., Almeida et al. 1999, Downey et al. 1999, Repetti & wood 1997), physical symptoms (e.g., Suls et al. 1994), and mental health (e.g., Alloy et al. 1997)” as cited by Bolger, Davis & Rafaeli (2003).

In recent time with the introduction of Internet and boom in technology, it is often to associate diaries with web journals, newsletters and blogs. Although they are relatively similar in terms of expressing individual thoughts via daily life experience, the concept of a diary is relatively a collection of self-published entries of an individual life journey mainly for the sake of keeping track of our personal life through personal review and reflection. Writing diaries are still being practice at present regardless of the medium to keep the entries as diaries have known to contribute to the well-being of our own life through expressive writings and also our outside world as reflected by the liked of well-known diaries such as ‘The Diary of a Young Girl’ by Anne Frank, whose diary was well-known as one of the most famous modern diaries, wrote based on her real life experience of hiding during the German occupation of Amsterdam in the 1940s and had caused a strong rise of psychological effect against tyrants and terrorism, and ‘The Diary of Samuel Pepys and John Evelyn whom their works are regarded as one of the most important primary references for English Restoration period in 17th century. Essentially, the desired outcome of the project is to overcome the physical problems that the traditional way of practicing expressive writing using diary by converting the concept to a mobile application is far more relevant to the current lifestyle which is more flexible and mobile.

1.2 Problem Statement

Living in the 21st century is reportedly twice as stressful as a few decades ago according to the recent study by Cohen and Javicki-Devents (2012). The data suggest that there has been a significant increase in stress over time and in three separate studies done in 1983, results indicate that life are perceived as more stressful over time especially women. Another survey carried out by 2010 national survey of college freshman, it is discovered that today’s group of student have the worst emotional health of any student group ever studied as cited by OnlineCollegeClasses.com (2012). Based on the findings, among the biggest causes of stress is reported to be academic work load and relationships. It is important to denote that lifestyle changes through the years and in the current era, humans are surrounded with the latest technological advancement which is not only solving more problems but also creates new problems. For instance, more of office or students works are carry out online and the need to stay connected is far more demanding with the existence of faster internet connection, portable Wi-Fi signals and smartphones. Because of that, people are having lesser time to

carry out personal rituals such as diary writing; in fact, people are getting less sleep and rest due to constant amount of things to focus on. More often than not, people simply do not have time to keep track of their daily lives, even writing an entry in diary per day is out of the question. Now with smartphones introduced to the world, writing diary entries on pen and papers is not really an ideal activity that fits into the busy lifestyle. As a result, diary writing is fall out of practice or trend yet diary has proven to be one of the best ways to express our daily thoughts and keeping track of every single of them. On another note, recent study reported that “people are spending more time on smartphones than our partners” according to DailyMailUK news published on May 30, 2013. The study carried out by O2 phone provider shows that the average smartphone user spends about 119 minutes or 2 hours a day on the phone yet the amount spent on our significant per day is just 97 minutes.

Apart from the health issues that we are currently facing due to lack of expressive writing practice, the current traditional practice of writing diaries has several limitations that cause the art to fall out of favour. They are:

- Physical problems of the books such as limited number of pages, hard to recover old entries once the book is lost or pages are thorn
- Search for specific pages or entries to review once more than 1 book is used
- Manage more than 1 diary at one time
- Inconvenient to carry the books all the time
- Privacy invasion if the diary is found or stolen

Based on these findings, if a suitable diary writing mobile application can be developed, it is possible to incorporate the practice of diary writing while on the go, such as waiting for public transport or while idling after having a lunch. In other words, a mobile application will provide a more flexible and convenient experience to keep a personal diary or journal.

1.3 Significant of Project

The mobile application that will be developed in this project will serve as an alternative platform for users to exercise expressive writings through keeping diaries or personal journal apart from the traditional books and pens. With the changes in our lifestyle as well as introduction of advance technology, it is essential to develop something that is in-line with the progression of the technology; in this case, introduction of smartphones has revolutionize the way we live our lives through development of mobile applications. With the introduction of this application, it will open up more possibilities or theories that can be tested and experiment to figure out the best techniques to incorporate expressive writings in our current lifestyle.

1.4 Objective of Project

The objectives of the project are as followed:

- To study and explore expressive writing used in diary/journal writing
- To design and develop a suitable mobile application that resembles a physical diary
- To test and evaluate users' behaviour based on their experience in using developed mobile application

1.5 Scope of Project

For this project, Android operating system is selected as the platform of the system as it is “the most popular mobile operating system in the world” (Olanoff, 2013). There are various ways of writing diaries or personal journal, however in this study; the application focuses on personal life diary, which is the documentation of individual's series of daily life experience or thoughts. University students are a perfect scope to test out the application because in this stage of life, balance between personal life and work is starting to get more important as individuals are living on their own most of the time and university's life should be something that one should cherished, recorded and remembered as part of lifetime journey. In this project, Universiti Teknologi Petronas (UTP) student is chosen as the scope of initial data gathering.

1.6 Relevancy of Project

The project is relevant to everyone who wants to incorporate expressive writing in their life using smartphones. With the existence of suitable mobile application which resembles the traditional diary book, users will have more mobility and flexibility as well as enhance user experience in keeping their diaries or personal journal.

1.7 Feasibility of Project within Scope & Time Frame

The time and scope frame of the project is suitable for the evaluation of the final year project. Final year project module is divided into two semesters, namely first semester focuses on preliminary research works and documentation while the second semester focuses on the development of the working prototype and various presentation sessions for final evaluation purposes.

CHAPTER 2

LITERATURE REVIEW AND/OR THEORY

2.1 Mobile Application

According to Dehlinger and Dixon (2013), mobile devices are the fastest growing computing platform with an estimated 1.6 billion mobile device users by 2013 as compared to the current estimate of 2 billion personal computer users. Based on their research, the rapid development of mobile devices over the last five years has dramatically altered the platform that is utilized for social, business, entertainment, gaming, productivity and marketing using software applications. Harrison, Flood and Duce (2013) believe that advances in mobile technology have enabled a wide range of application to be developed that can be used by people on the move and mobile applications are seen as a replacement to traditional and logical tools that was once useful to the mankind that can be cramped inside a handheld device, newspapers, magazines and books to name a few. Lettner, Tschernuth and Mayrhofer (2011) reported in their research that smartphone penetration in 2011 is at 50 percent in the U.S. and according to a new report from Nielsen, mobile consumers download more apps than ever before, with the average number of apps owned by a smartphone user now at 41, a rise of 28 percent from the 32 apps owned on average last year. With features such as global positioning sensors, wireless connectivity, photo and video capabilities, built-in web browsers, voice recognition and other sensors, mobile devices have led to the development of mobile applications that can provide rich, highly-localized, context-aware content to users in handheld devices; in other words, they are equipped with similar computational power as a standard personal computer. When talking about mobile devices, it is important to acknowledge and understand the key differences between a mobile website and a mobile application, which are both accessible on handheld devices. A mobile website according to Compuware is similar to any other website that consist of browser-based HTML pages that are linked together and accessed over the Internet. The obvious characteristic that distinguishes a mobile website from a standard site is in the design while a mobile app is built for a smaller handheld display and touch-screen interfaces. By contrast, mobile applications are actual applications that are downloaded and installed on the mobile devices rather than

being rendered within a browser. The application may pull content and data from the Internet or it may download the content so it can be accessed without an internet connection.

The combination of computing power, access to novel sensors and the ease in which applications can be monetized and transferred to the marketplace has made mobile application the new IT computing platform for development (Dehlinger and Dixon, 2013). The most popular operating systems for smart devices are Apple's iOS and Google's Android. As cross-platform development tools are complex to deal with, developers have to face a decision on which platforms their native application should be supported first or ported to later on (Lettner, Tschernuth and Mayrhofer, 2011). This is because of certain limitations of mobile platforms possess such as security mechanisms and application programming interface (API) that suggest that not every type of application is suited to be implemented on every platform. However out all of platforms studied in their research, Android is a preferred mobile platform due to the fact that open-source allows users to be creative and innovative in their development such that issues can be detected and fixed faster by a bigger community. Yoon (2012) agrees on the similar view that lots of hardware vendors adopt Android and its market share is also increasing because Android is open source software and offers developers free platform to make their own applications. Another aspect of mobile application that developers often overlook is the usability of the application that will determine the success or failure of the application. Research by Harrison, Flood and Duce (2013) has identified five attributes of usability:

- Efficiency: Resources expended in relation to the accuracy and completeness with which users achieve goals.
- Satisfaction: Freedom from discomfort, and positive attitudes towards the use of the product.
- Learnability: The system should be easy to learn so that the user can rapidly start getting work done with the system.
- Memorability: The system should be easy to remember so that the casual user is able to return to the system after some period of not having used it without having to learn everything all over again.
- Errors: The system should have a low error rate, so that users make few errors during the use of the system and that if they do make errors they can easily recover from them.

With the increased processing power available on portable devices, developers tend to increase the range of services they provide. So it is crucial to understand the limitations of mobile devices in which users can interact with them such as small screen size, poor connectivity and limited input modalities because all of these have an effect on the usability of mobile applications.

2.2 Psychological Health through Expressive Writing

Writing diaries or personal journal are not exactly a breakthrough in any form of technology yet the habit or the practice of writing them does not only help individuals to keep track of their daily lives but also improve their health and mental state through expressive and creative writing. This is happen to be an interesting discovery because for the past centuries, personal diaries or journals are solely use as a medium to express and record author's thoughts in a free discrimination and external criticisms space based on their life experiences, without realizing that through expressive writings of one self-thoughts, one would gain health benefits. According to the research published in the September issue of American Psychological Association (APA)'s Journal of Experimental Psychology: General (JEP: General) (Vol. 135, No.3) as cited by Carpenter (2001), it indicates that "expressive writing lowers intrusive and avoidant thoughts on negative events as well as improves working memory". Researchers believe that these improvements may free up individual's cognitive resources for other mental activities including the ability to handle stress more effectively. As a matter of fact, Kacewicz, Slatcher and Pennebaker (2004) from the University of Texas at Austin say that "when people transform their feelings and thoughts about emotional experiences into language, their physical and mental health often improve". Based on their increasing studies in the matter, the results indicate that having individuals write about their inner emotions and thoughts can result in significant health improvements in social, psychological, behavioural, and biological measures. Beyond that, their research discovers that personal diary or journal serve as best platform to do expressive writing and the value that it provides is as significant as traditional therapies but with lower cost and greater accessibility. The concept of diary writing has since been incorporate in therapy session based on various studies and preferences of respective therapeutic researchers. Hymer (1992) believes that "diary helps fill in lacunae in the patient's memory", such that "both therapy and diary writing focus on retrieval of memories, catharsis, self-expression and self-analysis".

The diary is view as invaluable therapeutic adjunct that facilitates the insights and feelings between sessions and projecting memories that might otherwise be gone. Through this setting, therapists may handle patients' request based on their read selections from their diaries. On the other hand, Neumann (1985) views diary writing as "a mean of increasing self-evaluation". He argues that therapy sessions that involves diary procedure clinically has been beneficial in gathering personal data, encouraging self-evaluation activities, facilitating rapport and provide useful materials in understanding cognitive style and validating therapy progress. In addition, Laitinen & Ettorre (2007) in their studies on depressed Finland women demographic suggest that writing diaries provide meaning for their own experience of depression that enables the enhancement of the therapeutic process.

More studies indicate that expressive writings through diary can go as far as coping with real-life stress and downfalls. Baikie and Wilhelm (2005) in their research on psychiatric treatment suggest that "writing about traumatic, stressful or emotional events has been found to result in improvements in both physical and psychological health, in non-clinical and clinical populations". Their research was highly motivated based on the first study on expressive writing (Pennebaker & Beall, 1986) where college students were asked to write for 15 minutes on 4 consecutive days about 'the most traumatic or upsetting experiences' of their entire lives and participants who wrote their deepest thoughts were reported to gain significant benefits in physical health 4 months later, with less frequent trips to the health centre and suffer less mental illness. More studies were carried out to support the theory and as cited by Adams (1999) that Dr. James Pennebaker has conducted studies that show when people write about emotionally difficult events for just 20 minutes at a time over three or four days, their immune system functioning increases, indicating that the release offered by writing has an immediate effect on the body's capacity to withstand stress as well as fight off health diseases. Pennebaker has since involved in more studies covering various psychology areas in regards with expressive writing. Seagal & Pennebaker (1999) suggest that "forming a story about one's experiences in life is associated with improved physical and mental health across a variety of populations", such that the value of having a structured format as a way to identify meanings to an event and manage the emotions associated with it. Further study by Slatcher & Pennebaker (2006) suggests that the social effects of expressive writing on confronting complex thoughts can facilitate social interactions. Using romantic relationship as the research question, when people write expressively about recent relationship breakups, "they are somewhat more likely than control participants to reunite with their partners"

(Lepore & Greenberg, 2002) as cited by Slatcher & Pennebaker (2006). Pennebaker & Chung (2007) further breaks down the expressive writing diagram theory, suggesting that “the more that people used positive emotion words, the more their health improved”; however negative emotion word usage was curvilinear and not linearly related to health change after writing”. Another interesting study to further support the theory was carried out on Intensive Care Unit (ICU) patients during illness by Carl G. Bäckman and Sten M. Walther. Bäckman & Walther (2001) explore the use of a diary as an aid in debriefing parents and relatives following critical illness and found that “a detailed narrative of the patient’s stay is useful tool in the debriefing process following intensive care”. In the study, a daily account of the patient’s progress was written by nursing staffs, adding photographs as necessary and booklet was given to patient at a follow up appointment 2 weeks after the patient’s discharge date. Standard questionnaire was mailed 6 months later and results indicate that patients were grading the questionnaires as positive at 67% in debriefing their recovery.

2.3 Importance of Diary Writing

Aside from health benefits, writing diaries or personal journal has been used as a tool in enhancing learning and professional self-development. Hiemstra (2001) argues that personal journal writing is “a learning method to aid learners in terms of personal growth, synthesis and reflection on new information that is acquired”. Hiemstra believes that journaling promotes critical self-reflection which is essential in the development of a personal statement of philosophy or a code of personal ethics as showed in his 1999 study on personal journals. Richardson (1995) also believes that reflective diary is an effective tool for promoting reflection and learning students via self-assessment and evaluation of clinical learning experience. His work is a study of 30 undergraduate nurses and implementation of reflective diaries in a period of their services, reflecting that 94% of the nurses attain highest level of reflectivity in their conceptual and theoretical based on Mezirow’s level of reflectivity. On the other hand, Klein & Boals (2001) suggest that “expressive writing can increase working memory capacity”. Their study on 35 freshmen indicates people who write about their thoughts and feelings demonstrate larger working memory via increase use of cause and insight words which is associated with greater working memory improvements. Their findings are further break down by the studies of Pennebaker & Chung (2007), suggesting that “those who use more insight and causal words in their emotional writing tend to gain the

most improvements in working memory and at the same time, report drops in intrusive thinking about negative events (Boals & Klein, 2005; Klein & Boals, 2001)”.

Despite the number of promising studies in expressive writing and diary keeping, it is still subjective in terms of “whom it works best, when it should be used, or when other techniques should be used in its place” (Pennebaker & Chung, 2007). With the changes in lifestyle and booming of technology, the study of expressive writing is getting more complex such that internal and external events play a huge role in our daily life and the thoughts that one would express is highly dependent on that. After decades of research, strategies must continue to grow and relevant as diary writing has been around for so long and the benefits gained from keeping one are just too valuable to be forgotten and fall out of practice.

CHAPTER 3

METHODOLOGY/PROJECT WORK

3.1 Model Framework

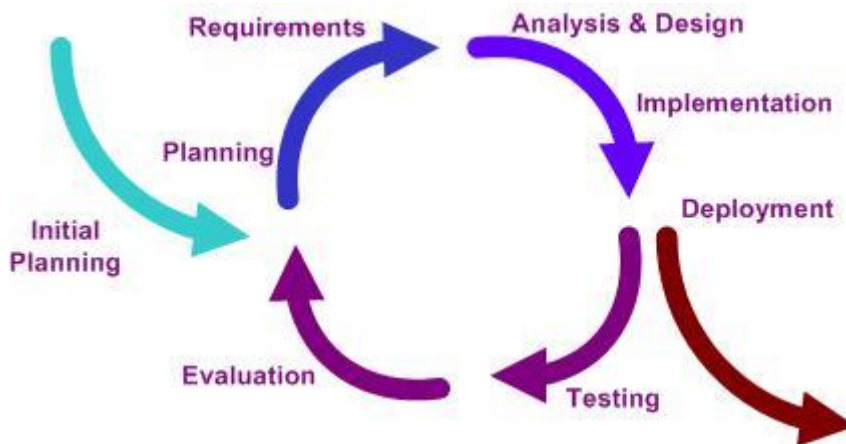


Figure 1 – Iterative and Incremental Development

The approach or the model framework of the project development is iterative and incremental development. Iterative and incremental development is a discipline for developing systems based on producing deliverables. The basic idea behind this approach is to develop a system through repeated cycles (iterative) and in smaller portions at a time (incremental), allowing developers to take advantage of what was learned during development of earlier parts of the project. In other words, in incremental development, different parts of the system are developed at various times and integrated based on their phases while in iterative development, parts of the system will be revisited in order to revise and improve them. Successful deliverables are usually through modifying targets of the system consulted by user (feedbacks).

This approach is ideal because the operating system involved in mobile application is flexible to be built, with minimal purchase of hardware and tools required to complete. Apart from that, the time constraint is not an issue because the time given is ample to allow rooms to iterate the phases whenever necessary. So the research can be focused on constantly improving the system to ensure meeting the objectives of the project.

3.2 Initial Planning

In this stage, a preliminary survey is conducted to gather early data requirements as well as general responses regarding the proposed project. The targeted audience in this survey is students of Universiti Teknologi Petronas. The targeted subjects may comprise of students who has previous experience in diary writing or none at all. It is proposed that the research method to be utilized would be e-mail surveys (distribution of questionnaires). The results from the questionnaires will be keyed into a Microsoft Excel spread sheet in order for easy generation of graphs and tables.

3.3 Planning

Milestone acts as an indicator in which an event in the project schedule has completed when a key task or deliverable has been achieved. They have zero duration because they symbolize an achievement, a point of time in a project. Milestones are frequently used to monitor the progress and accomplishment of the project. These milestones are also act as control points as key decision will be made which any changes will give direct impact upon the output of the project. Gantt chart is then generated to illustrate the project schedule.

3.3.1 Key Milestones

a) FYP1 (14 weeks)

No.	Milestone	Week
1	Submission of Extended Proposal	6
2	Prototype I: Basic Interface Design	11
3	Proposal Defense	11
4	Submission of Interim Report Draft	13
5	Submission of Interim Report	14

Table 1 – FYP1 Milestones

b) FYP2 (15 weeks)

No.	Milestone	Week
1	Prototype II: Basic System Design	6
2	Submission of Progress Report	7
3	System Integration	9
4	Pre-SEDEX	10
5	Submission of Draft Report	11
6	Submission of Soft-Bound Dissertation	12
7	Submission of Technical Paper	12
8	VIVA	13
9	Submission of Project Dissertation	15

Table 2 – FYP2 Milestones

3.3.2 Gantt-Chart

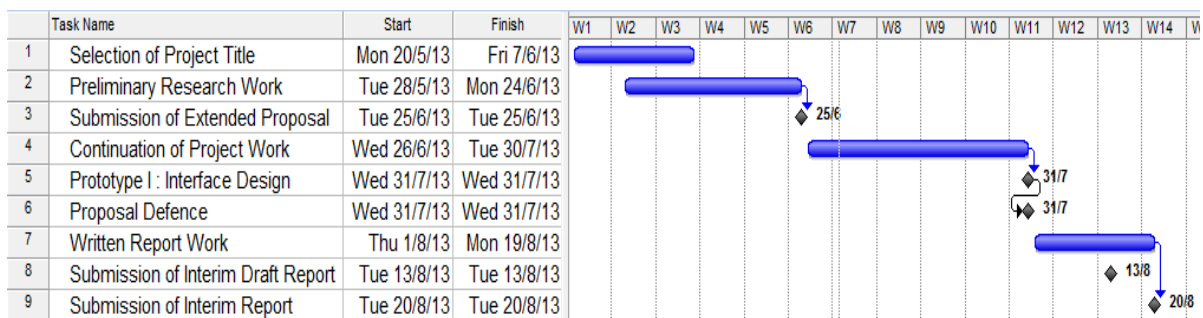


Figure 2 – FYP1 Timeline

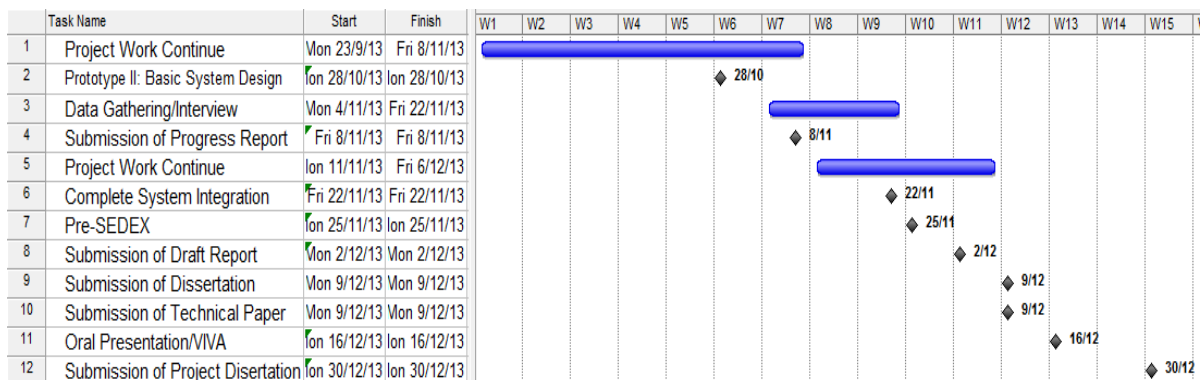


Figure 3 - FYP2 Timeline

3.4 Requirement, Analysis & Design

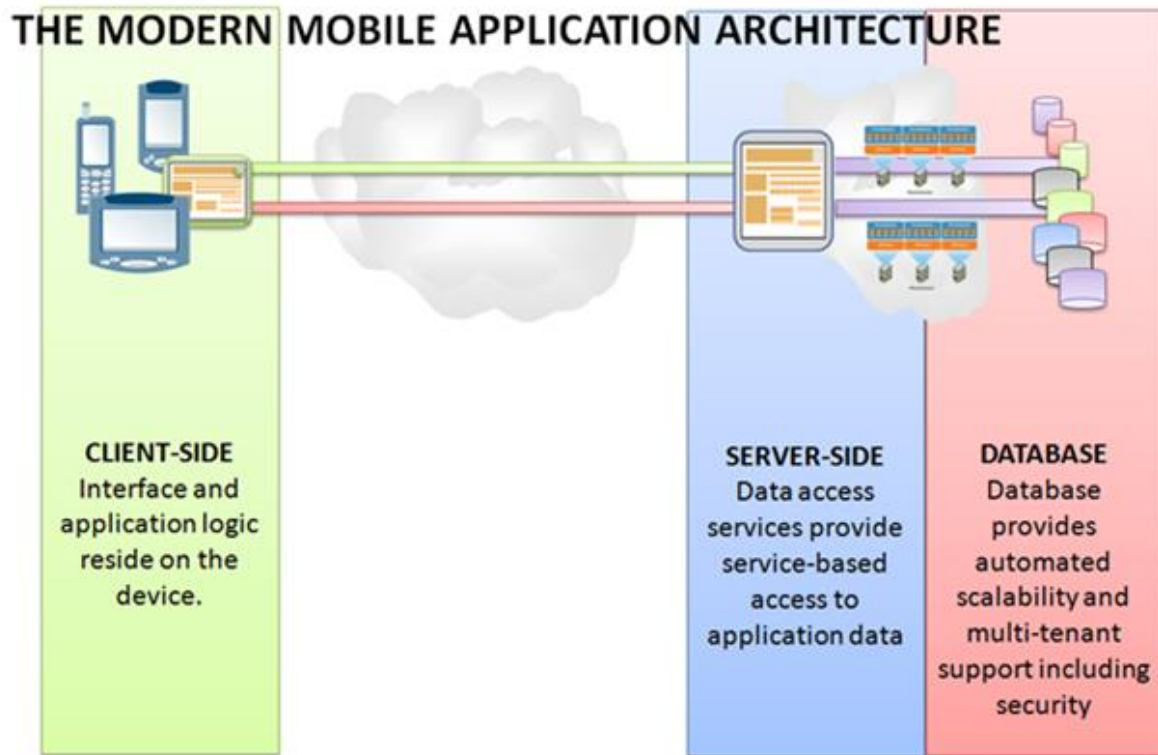


Figure 4 – Modern Mobile Application Architecture

The application that will be developed in this project will follow the modern mobile application architecture as illustrated in figure above. The architecture consists of:

i. Client-side

The interface and application logic will reside on the device. User will directly interact with the graphical user interface to establish connection with server-side and database. The framework of the interface will be developed using XML and program using JAVA language.

ii. Server-side

The data access services provide service-based access to the application data. Server acts as the middle-man between clients and database. Cloud servers will be used in this project.

iii. Database

Data will be stored in the database as it provides automated scalability and multi-tenant support such as data security and server authentication. Cloud database will be utilized in this project and SQL is the primary language used in the database.

3.5 Project Tools

As mentioned in the literature review, Android is an open-source software and the community are free to explore the software according to their needs and interest. Developing one Android application may not require as much tools as other platforms as Google themselves have provided Android's own Software Development Kit (SDK) which allows user to build applications with minimal knowledge in programming. In this project, there are several tools that were used to develop the prototype of the application namely:

- Adobe Photoshop

The graphics editing program developed and published by Adobe Systems. Adobe Photoshop was used to develop the basic framework as well as the graphical user interface of the application.

- Android SDK

Android software development is the process by which new applications are created for the Android operating system. Applications are usually developed in the Java programming language using the SDK. Android SDK includes a comprehensive set of development tools such as debugger, libraries and handset emulator that are embedded in integrated development environment (IDE) known as Eclipse. Eclipse was used to integrate the interfaces that were developed earlier and compile it with Java code source written in Android SDK before running it on emulator or a smartphone as a working mobile application.

- Parse

Parse is a service that provides cloud database storage to store information from client side of the system. Parse acts as the server and database side of the project to store relevant data transferred from the smartphone in cloud. This service is essential as the project follows the modern mobile application architecture where data are stored in secured cloud database in order to improve security and integrity of the data (privacy protection).

CHAPTER 4

RESULT AND DISCUSSION

4.1 Preliminary Questionnaires

The preliminary survey was conducted among Universiti Teknologi Petronas students as part of initial planning stage of the project development. 19 students responded to the survey and the results are represented by graphs based on the 3 questions that were addressed:

- Do you currently keep a diary?
- Reasons for not keeping a diary?
- Would you start keeping a diary if your mobile has a diary app?

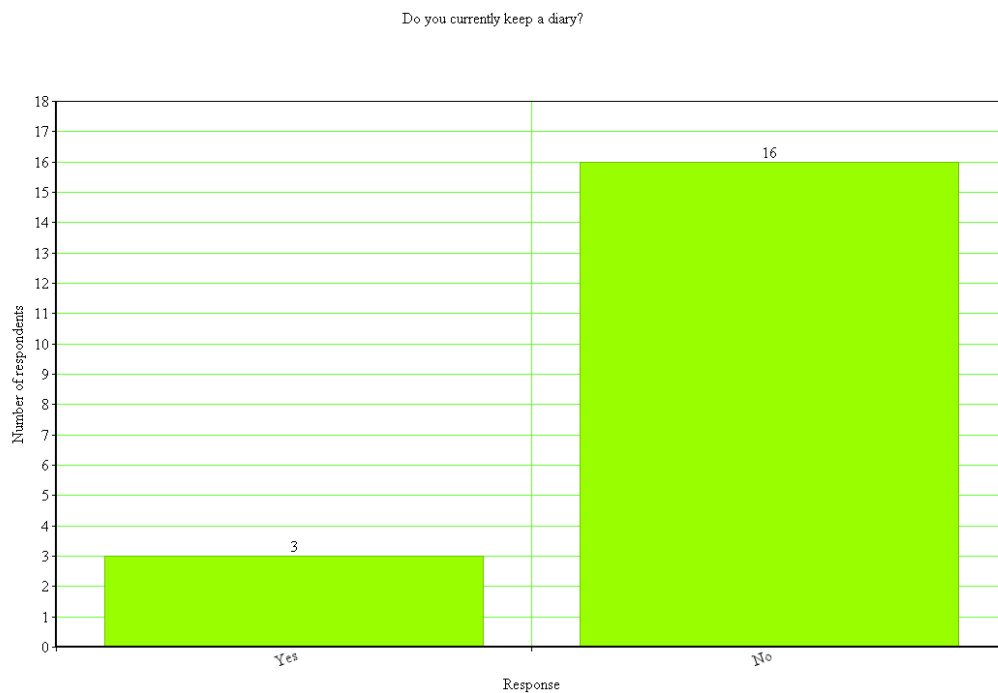


Figure 5 – Results for the question “Do you keep a diary?”

Based on figure 5, majority of the students is not currently keeping a diary. This reflects that the diary keeping is not popular among the respondents. This explains the fact that the traditional way of keeping a diary has fallen out of favour as the lifestyle of a university

student is unpredictable and carries huge responsibilities on education to even consider writing an entry a day is just not worth their time. With commitments and much more important task than simply keeping a diary as well as distraction such as computer games and mobile phones, diary writing is just does not fit into their lives.

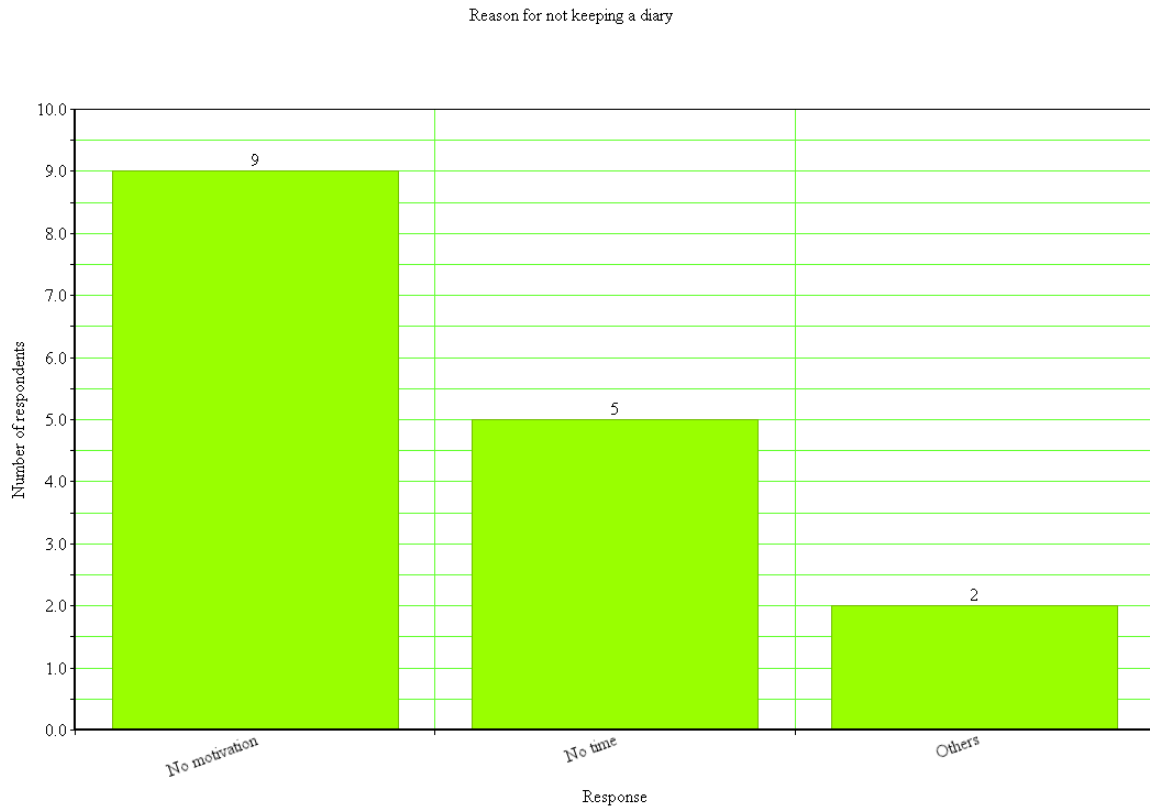


Figure 6 – Results for the question “Reason for not keeping a diary”

Based on the figure 6 above, majority of the respondents feels that they lack of motivation to keep a diary. Essentially writing in general is a very passive and monotonous activity and in a long run, it will reach a point where the writers will feel that they are lacking of motivation to write more. Apart from that, there is no interactive interaction when someone writes in book which may cause the same effect. Back then, when technological advancement was not that huge, people use books as a mean to keep their diary as it was the best option for them to do so. Now, the old method may not seem to be relevant and fit the current lifestyle and even better, access to better tools and technology is there to develop a better medium which has better interaction, convenient and flexible offered by mobile applications. Other than that, this survey has led to the idea of introducing reward system which will be discussed further in the suggested future works for continuation. The reward system will serve as the foundation

to keep users' motivation to practice expressive writing consistently using the developed application. Also, the creation of the application will also tackled the lack of time that respondent faced because through literature studies, users are spending huge amount of time on smartphones and chances for them to write their entries on smartphone is high.

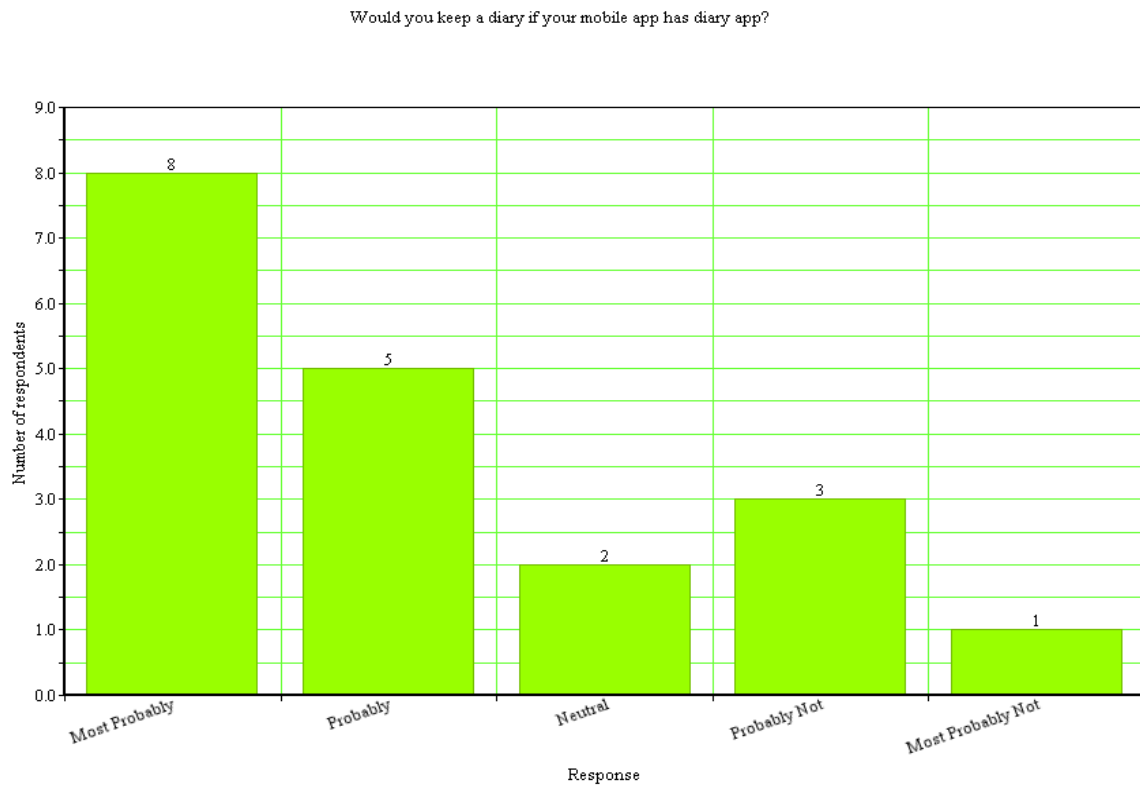


Figure 7 – Results for the question “Would you keep a diary if your mobile has a diary app?”

Based on the figure 7, majority of respondents are inclined to keep a diary if mobile diary application exists. This is because of the features that mobile applications provide which a physical diary book does not. Mobile applications are far more flexible and easier to use such that user can manage their diary whenever they bring their smartphones at any place at any time of the day. Besides that, mobile applications does not possess physical problems that can jeopardize the content of the diary such as lost or torn pages, limited pages and stolen as mobile applications are connected with cloud database which securely store the data. Aside from that, mobile application has interactive interaction via its graphical user interface which is more interesting than writing on a book that will make the user more interested to write.

4.2 System Design

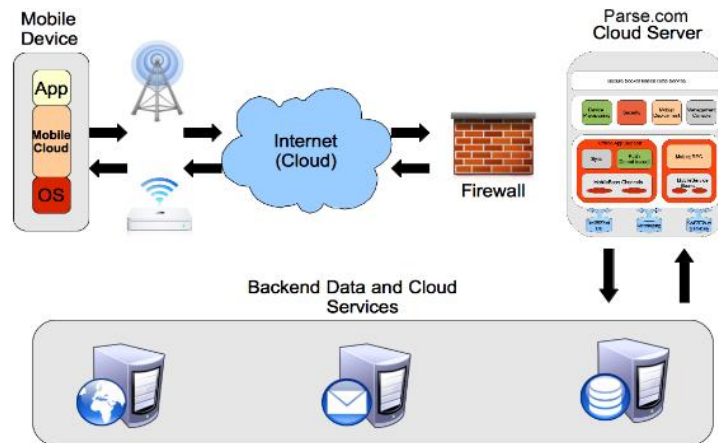
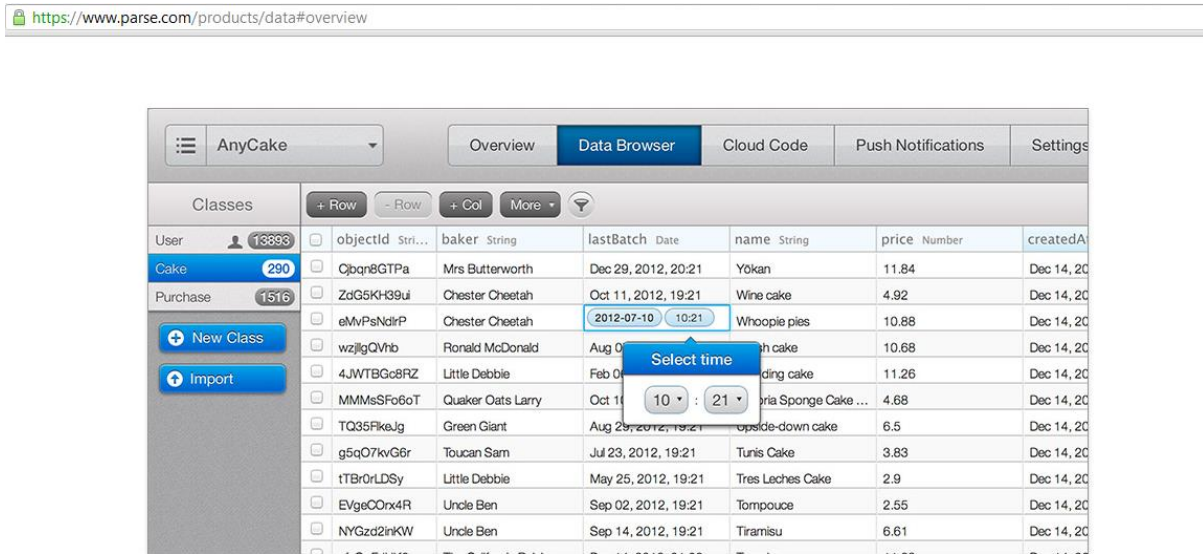


Figure 8 – Parse.com Cloud Mobile Application Architecture

The system will be incorporating the concept of cloud computing based on Parse.com cloud mobile application architecture in Figure 8. The interface of the application will reside at the client side of the architecture which is in the mobile device. A connection will be established via internet over the cloud network and before connecting to the cloud server, it will be handled by a firewall to ensure maximum security. Once the connection is established with the cloud server, the server will communicate interchangeably with its backed data and cloud services according to the request from the client-side. Essentially, the location of the servers and database is not known to public which is the key feature of the cloud computing. This is because the application does not store to a local server or database. Instead, it will store over an internet network and synchronize with the data programs in the network according the information given. Therefore, when the application is being accessed from the mobile devices, it will only require the user interface to communicate remotely with the cloud servers as it is not stored locally in the phone. This is very useful when it comes to changes or stolen mobile phones whereby the data stored can be still accessed in the cloud as long as user has account identification to do so. Also, user does not have to worry about local storage of the phone as cloud computing will take care of the workload in their network.

4.3 Server-side Database



Powerful Data Management

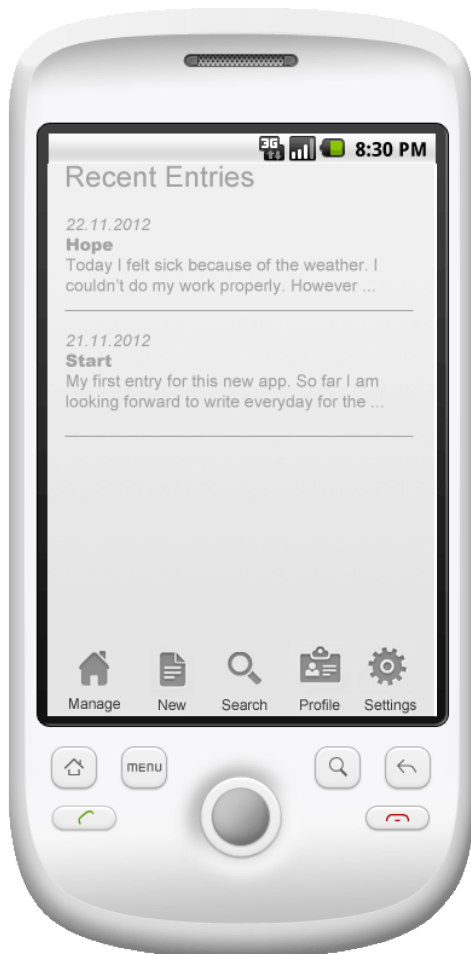
Manage, search, and update your content without writing a single line of code.

Figure 9 – Database System used in Parse.com

The database system that will be utilized in this application works similar with the database system used in websites except it is much simpler in terms of management and less complex. Parse offers a powerful data management similar to SQL's PhpMyAdmin system. With data management, activities such as manage, search, update column are much easier to perform without worrying about coding. According to Parse.com, the data management allows the developer to manage objects in spreadsheet-like interface whereby it can view the data in full-screen mode, sort by columns and view up to 100 objects per page. With that features, managing the database is less complex and developer can focus more on quality features and user interface. Apart from that, the data management has advance filtering feature whereby data can be filtered directly from the spreadsheet especially when dealing with large amount of data associated with the application. Parse is among few services that offers free limited database for new mobile application and it is ample to meet the time and scope frame of the project.

4.4 Client-Side Interface/Prototype

i. First Prototype



(a)



(b)



(c)

(d)

Figure 10 – First prototype of the application (Basic Framework)

Figure 10 shows the first prototype of the application which is only the basic framework of the application. For this prototype, it is important to ensure that the application can run its basic applications as intended so the overall design may not be appealing as it is not the focus of the prototype. Only in the prototype 3 after the basic system design is complete for prototype 2, the overall graphical user interface will be further improved to make it more appealing to users. However, the concept that will be considered in the design is simple and

easy to use, meaning the application interface may not be fancy or outstanding graphics but smooth and clean interface.

There are 5 main buttons at the navigation bar at the bottom of the screen. The navigation buttons in the application represents the basic functions of the application which are:

Function	Description
Manage	Act as a home page of the application whereby recent entries will be displayed in a form a list as shown in Figure 10(a). Users can directly edit their recent entries by touching the entries accordingly.
New Entry	Displays text fields to create a new entry in the diary as shown in Figure 10(b).
Search	Search for past entries made by users as shown in Figure 10(c). Touching the specific entry will navigate to edit entry section where users can edit or delete their entry.
Profile	Displays the user's personal information, statistics and achievements based on reward system implemented as shown in Figure 10(d).
Settings	Allows user to adjust general settings of the application such as change password and enlarge text.

Table 3 – Main functions of the application

ii. Second Prototype

The project resolves in finishing the user interface first before proceeding to the development of the functionality of the application as planned in the project schedule. User interface serves as the foundation layer that must be built in order to ease the development of its functions later in the stage. After going through the first VIVA presentation of FYP1, the basic framework has been approved and the external examiners are expecting to see the basic framework to be redesigned to a better and enhance user interface that is clean and simple. The second prototype which is the basic user interface is developed. As recommended by the previous supervisor, the user interface should be simple and clean design using Apple style application as a reference. Below shows the preview of the interface generated using free Apple predefined packs and redesign based on the basic framework of the application.

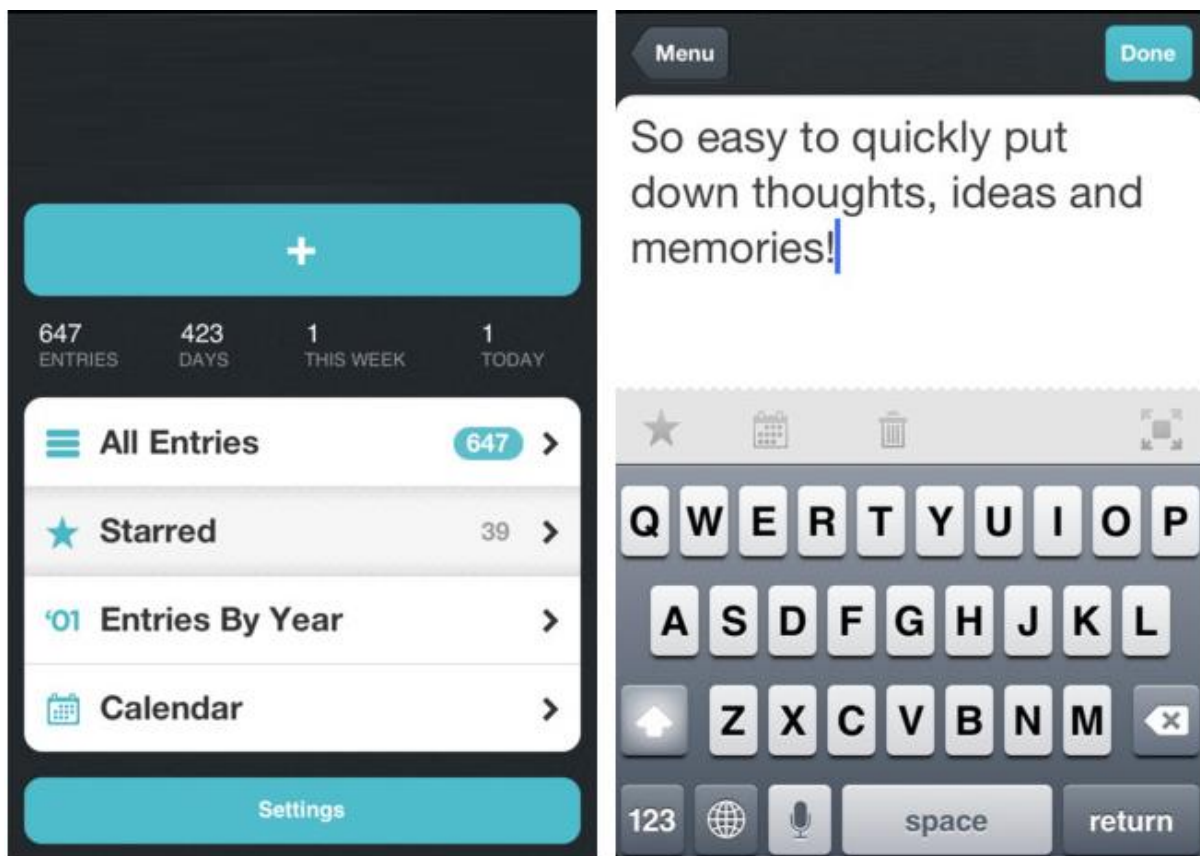


Figure 11 – Second Prototype

iii. Third Prototype

The final prototype was completed in Week 9 of FYP2 schedule. The system integration was completed with the new improved user interface as proposed by current supervisor. Initial system testing was carried out using the emulator of Android SDK before deploying the application to a smartphone and the application abides the system guide as mentioned in Android rules and regulations. The prototype was then presented and demonstrated during the Pre-Sedex that was held in Week 11. Below are the main screenshots of the final prototype:

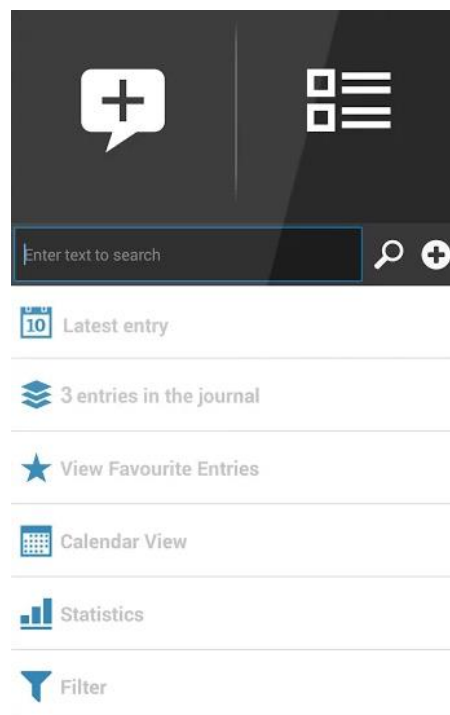


Figure 12(a) – Menu Page

The main functions available for the application are as followed:

- Write New Post (indicated by the plus symbol on the top-left corner) – Directs the user to the new entry section in order for user to submit his/her new diary post.
- List View (indicated by the button on the top-right corner) – Directs the user to a section where the previous entries are arranged in a form list for viewing purposes
- Search Navigation – Allows user to search for specific post in the database
- Latest Entry – Directs the user to the latest entry written by the user.
- Calendar View – Another option to view user's post whereby the entries are categorized based on the date of the post published in form of calendar.

- Statistics – Allows the user to monitor graphical statistics such as number of words written in the last month and number of post per week.

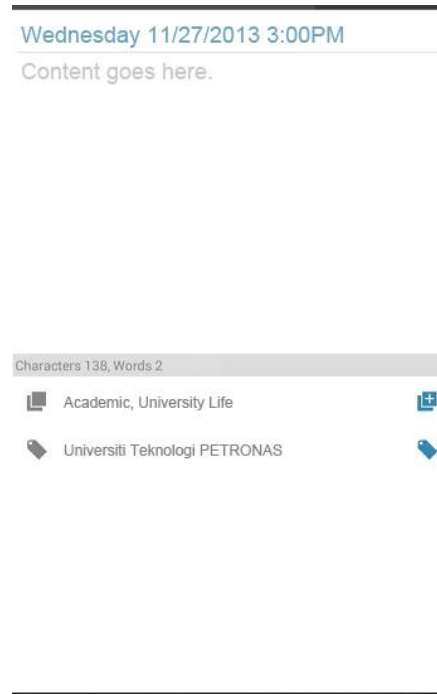


Figure 12(b) – New Post Section

This section allows users to make a new entry in their diary. There are 2 important features that help the user to manage their content. First feature is the ‘tag’ feature where user labels the entry based on main words used in the content. For example, if the user post about money, user can add the ‘tag’ of the post as ‘money’ so that next time when user wants to search for post related to money, the search navigation will yield the tag accordingly and list out the desired content. The second feature is category where users can categorize their post based on pre-defined categories. For example, if the post is related to finance, user can select the category of the post as ‘finance’ in the category button to indicate that this post belongs to the finance category. There will be also an indicator of number of characters and words in the new post section as an extra feature if the users are cautious about numbers of words that they type in.

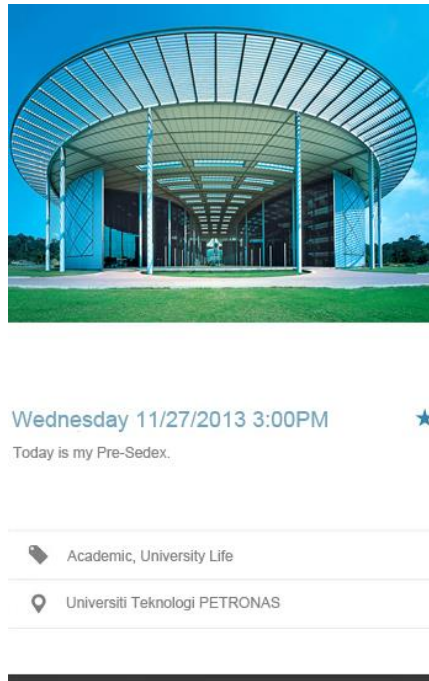


Figure 12(c) – Latest Post Section

Latest post section yields the full content of the entry. Users are given options to upload their desired photo or even audio to further enhance their content. Other features such as mood indicator, weather and location are extra features available to use according to their needs.

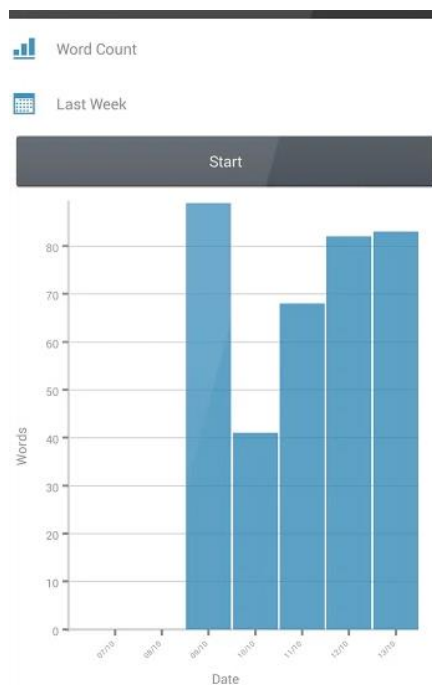


Figure 12(d) – Statistics Section

4.5 Discussion

There are few key considerations that are considered in developing mobile application. First is app features. There are plenty features that can be built into mobile app. The key to producing the best result is to be aware of the possibilities while having realistic goals. In this project concept of the app, the main goal I want to strive is to keep the app simple and suitable to users' needs and goals. Core features should be there in the early life cycle of the app and new feature can be added with subsequent upgrades. Second is target market. Demographic information can be used as a tool when addressing the best way to connect with target market as it is a major consideration which determines the platform development of the app takes place. So the choice of the platform is crucial. In this case, Android is a suitable choice simply because android has the largest user base. Last but not least, app designs. App that has great designs that are eye-catching will create attention and can attract users to choose and use the app. Functionality comes second as great designs and user interface gives great experience to users to use the app which is essentially important as we want to build app not just to make their life easier but also to satisfy people wants and needs.

There are few challenges that were faced during the development of the application:

- Phone upgrades and software updates - phone upgrades leads to new models with different screen sizes and capabilities as well as more flexibility that older/current phones cannot offer and it's rather complex to ensure the app will always work 100% given new updates are coming infrequently in this few years. Same goes to software updates which may introduce more features and computer languages that may coincide or interfere with the current system used to develop the mobile app.
- Publishing to various platforms and its integration - multiple screens with users are branching out their devices to tables, ultrabooks, laptops and also desktop. In order to further reach to more people, diverge the perspective to other platforms are very complex and risky as compatibility and flexibility of the app comes into play when integrating with other desired platforms. Different devices work differently so integrating the system accordingly may take a long time and if the investment will go out to the drain if the integration goes wrong.
- Security Data Risk - Freedom of data access through mobile and growing number of smartphone users possess threats and questions about security breach and potential data leaking. Development of mobile industry is relatively new and while mobile

devices have provide utilities in our daily life and makes us stay connected all the time, it is hard to know if the connection is 100% secure or not, whether transaction is encrypted properly or not and being new to the industry, there's a high possibility that people are finding ways to abuse the system. Plenty of attention is being paid to issues like network management and potential security threat that poorly engineered devices pose to enterprise organizations. However, poor software development practices in the mobile space might be creating much greater threat to corporate security; for instance, a lot of stolen cell phone in the wrong hands has the potential to cause troubles in corporate intranet.

CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.1 Conclusion

This final year project reflects the importance of expressive writing in our daily life and why should it be practice regularly as part of our daily activities. Through studying and exploring the theorem of expressive writing used in diary or personal journal, it is clear that the practice of expressive writing yields positive effects to the user especially in terms of psychological health which is one of main concerns in today's unpredictable world, i.e. stress and self-management. With the introduction of advance technology such as smartphones and cloud computing, it is essential to develop a suitable application that fits the current lifestyle which favours mobility and instant. In the case of incorporating expressive writing in our daily life, traditional books and pens may not be favourable at all times, so that is why there is a need to develop mobile application that resembles closely to a physical diary with better features to overcome its physical problems and such. However, it does not stop there as the application needs to undergo series of experiment and user testing to ensure it is align with results of the studies by various psychological researches. This phase will be conducted in the second semester whereby users will test the developed application on first-hand basis in order to evaluate users' behaviour based on their experience.

5.2 Suggestion for Future Works for Continuation

5.2.1 Reward System as the main persuasive technique

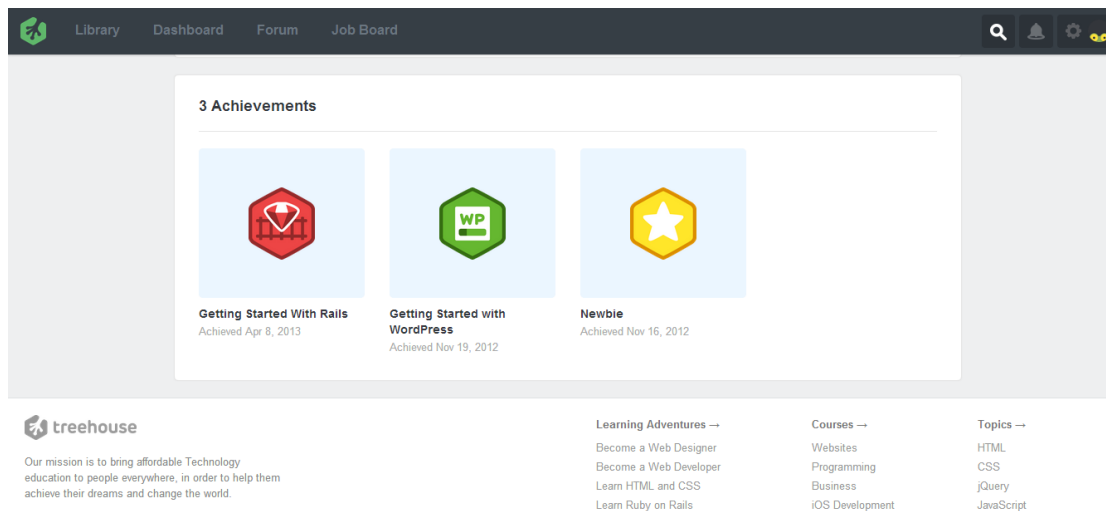


Figure 13 – TeamTreehouse.com Achievement Page

The main component that the application will offer that makes it unique is the reward system. Inspired by Team Tree House, an innovative web company that offers interactive programming language classes, the way they persuade clients to learn more effectively is by rewarding them based on their achievements in successfully unlock the stages of the particular programming classes. In this case, badges will be awarded as part of the user's achievements or milestone while unlocking more advance stages for users to go through as shown in figure. For example, a user will be awarded 'Getting Started with Rails' badge when they successfully completed and passed the test in the first 'Ruby with Rails' course and the second stage of the course will be unlocked. These badges will be permanently shown in user's profile and they can showcase their badges to other participants in the community of Tree House. Based on their testimonials from the clients, they found out that rewarding system motivates them to learn more and better while unlocking more badges and other rewards such as premium access to more tutorials.

Similar concept of persuasion can be applied in the diary application for this project. Instead of rewarding them for completed their programming course, users will be rewarded for achieving specific milestones based on writing streak and amount of entries in that particular month. For example, if the user has written an entry for 30 days in a row, a badge will be rewarded, signifying that the user has achieved the milestone of 30 days of entry in a row. With the idea in mind, the user will be more motivated or inclined to write again to keep their

writing streak and strive for more days to unlock the next milestone. This is important as in order to exercise expressive writing efficiently, one must write consistently and with the reward system, it is possible to ensure that the users will be writing their entries consistently. There may be a better application that provides better features but if the user does not write consistently or lack of motivation in a long run, eventually the application will not be utilized. Therefore, it is essential for the application to implement the reward system to ensure the user will always be motivated to practice expressive writing consistently. Although it may sound simple, the reward system must be thoroughly plan and structure accordingly in order to attract users to use the application in a long run.

5.2.2 Integrate Social Media Model

Nowadays, the society embraces the culture of social media, an interactive platform to connect with people instantly and worldwide. Social media services such as Facebook, Twitter, Instagram and Vine have made it possible for everyone to interact with millions of users from all around the world via internet with just a few clicks. Now with smartphones, the interaction is much more mobile, flexible, simple and instant to the point that addiction to smartphone may occur and this feature has made social media one of the best platforms for businesses to advertise and generate revenue for their services. Therefore, if the diary application can be integrated to social media model, users can interact with each other with similar interest and passion while exchanging their thoughts or share their diaries to the desired group of people. With the social interaction, users are not only able to make more friends but also more expressive in their writings when sharing their thoughts to other people. However, integrating this model will require immense amount of time and work as well resources in order to ensure the service is reliable and run smoothly and it may not be feasible be develop in this project given the limited time and materials to work with. Despite that, this idea can be considered as future work for continuation as social media is in-thing now and users are crave for interactive interaction when it comes to mobile application.

5.2.3 Multi-Screen Strategy

Multi-screen strategy arises when smartphones are getting more popular and important in our daily life. The strategy refers to the convergence occurred among people who own multiple devices which includes smartphones, televisions, gaming consoles, computers and tablets. It is essentially an idea that not everyone is inclined to only one device and if the application works across the board of the infamous 3-screens, i.e. computers, tablets and smartphones, it will increase the number of users significantly. With the power of cloud computing, it is possible to sync multiple devices together and this offers flexibility as user doesn't need to have all devices at the same time and place such that any changes in any of devices are automatically synchronized. However due to limited time and resources, implementing the strategy will not be possible at the end of the project period although it can be considered as suggested future works for continuation as it provides flexibility as well as enhance user experience and interaction with the application.

5.2.4 Better User Interface

The main concern of the project is to ensure the application will be completed in a given time frame and worked as intended in order to study the user behaviour based on their experience of using the application. So user interface will not be the major focus of the development until the application is working properly as there are always rooms for improvement when it comes to user interface in a later stage of development. A programmer may not necessarily a good graphic designers so in the future work, where collaboration with professional graphic designers is possible, better user interface can be developed to further enhance user experience in using the application.

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