

TourDroid: Mobile Travel Assistant
A Visit Perak Year 2012 Case Study

By

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Dissertation submitted in partial fulfillment of
the requirements for the
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CERTIFICATION OF APPROVAL

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Approved by,

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UNIVERSITI TEKNOLOGI PETRONAS
TRONOH, PERAK
May 2012

CERTIFICATION OF ORIGINALITY

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

MOHAMAD ANIF BIN ADENAN

ABSTRACT

Tourism has always been among the nation's most profitable sector. Without it, Malaysia cannot be this prosper and well developed. Governments have always increased their investments in seeing this sector to grow harmoniously. With the correct way of advertising and marketing – most preferably the cheapest way possible, the tourism sector would be able to create much more inflow to the nation. An empirical study is done to link up how Android Smartphone application can become the most influential marketing tools in promoting tourism with the objective to redefine tourism experience to the tourists and travelers. With Perak State Tourism as the 'client' and Visit Perak Year 2012 as the case study, this project is aimed to help Perak Tourism provides better assistance to tourists who visit Perak by providing them with a mobile application called "TourDroid" functioning as a mobile checklist of fun and must-do activities at iconic places around Perak. The scope of this project is narrowed to top 10 icons of Perak namely, Royal Belum State Perak, Matang Mangrove Forest, Gua Tempurung, Perak's Herbal Garden, Sungai Klah Hot Spring, Orang Utan Island, Zoo Taiping & Night Safari, Ipoh's lime stones caves, Lumut & Pangkor Island and last but not least Kuala Kangsar as the crafts and arts hub of Perak. As the project goes, the deliverables would be a mobile application using Android operating systems called the TourDroid. By leveraging on the market potential of Android OS, TourDroid as a mobile application is seen to be a great opportunity to be further enhanced and provide better service to tourists.

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TABLE OF CONTENT

CERTIFICATE OF APPROVAL	i
CERTIFICATE OF ORIGINALITY	ii
ABSTRACT	iii
ACKNOWLEDGEMENT	ix
LIST OF FIGURES	x
LIST OF TABLES	xi
1.0 Introduction	1
1.1 Project Background	1
1.2 Problem Statement	2
1.3 Objective and Scope of Study	3
1.4 Relevancy of the Project	3
1.5 Feasibility of The project within the Scope and Time	4
2.0 Literature Review	5
2.1 Definition and Effects of Tourism	5
2.2 Tourists activities and spending	6
2.3 Marketing reality	7
2.4 Traditional marketing, trends and setbacks	8
2.5 Birth of the internet as advertising tools and information technology (IT)	9
2.6 The Rise of Mobile Application	10

2.7	Mobile Application and Tourism	11
2.8	Android OS and Its Mobile Application Market Share	12
3.0	Methodology	13
3.1	System Development Methodology	13
3.2	Project planning and feasibility study	14
3.3	System analysis	15
3.4	System design	15
	3.4.1 Graphical User Interface	
	3.4.2 Conceptual Design	
	3.4.3 Physical Design	
	3.4.4 System Architecture	
3.5	Implementation	17
3.6	Project activities	17
3.7	Key milestone	20
	3.7.1 Gantt chart	21
3.8	Tools and framework	21
4.0	Result and Discussion	23
4.1	Data Gathering Analysis	23
4.2	Comparison of TourDroid with Current Available Mobile Application	31
4.3	Prototype	33
4.4	Connections with Technology Acceptance Model (TAM)	40

4.5	Post-implementation survey	42
5.0	Conclusion and recommendation	46
6.0	References	48
7.0	Appendices	53

LIST OF FIGURES

Figure 3.1: Rapid Application Development model	13
Figure 3.2: TourDroid System architecture	17
Figure 4.1: Age Group	24
Figure 4.2: Smartphone ownership	24
Figure 4.3: Travel cost preference	25
Figure 4.4: Satisfaction of domestic travel	25
Figure 4.5: Knowledge about visit Perak year 2012	26
Figure 4.6: Knowledge about 10 icon of Perak	26
Figure 4.7: Perceived ease-of-use	27
Figure 4.8: Perceived Usefulness	27
Figure 4.9: The importance of using mobile applications	28
Figure 4.10: Familiarity for mobile application usage	28
Figure 4.11: Effect of using mobile application while traveling	28
Figure 4.12: Place to find information	29
Figure 4.13: Opinion on providing checklist for travel purposes	29
Figure 4.14: Activities to do at places of interest	29
Figure 4.15: Information on the World Wide Web and its drawbacks	30
Figure 4.16: Familiarity of mobile applications in providing information	30
Figure 4.17: Screenshot of TripAdvisor application (1)	31
Figure 4.18: Screenshot of TripAdvisor Application (2)	32
Figure 4.19: System flowchart	35
Figure 4.20: Use Case diagram	36
Figure 4.21: Home screen	37
Figure 4.22: Information screen	37
Figure 4.23: Checklist screen	38
Figure 4.24: Map screen	38
Figure 4.25: Direction screen	39
Figure 4.26: Reviews and comments	39
Figure 4.27: TAM Framework (Venkatesh & Davis, 2000)	40

LIST OF TABLES

Table 3.1: Development environment specifications	16
Table 3.2: Key milestone for FYP 1	20
Table 3.3: Key milestone for FYP II	21
Table 3.4: Gantt chart	22
Table 4.1: Integration Test Plan result	41

CHAPTER 1

INTRODUCTION

1.1 Background

Mobile and current Internet applications are thought to have significant potential to transform ways in which technology and tourism works and relate with each other. In the particular case of governing bodies and tourism, this new wave of technology in the form of mobile applications are perceived to be able to totally change the current marketing ways in positioning, attracting and servicing visitors in tourism sector. Not even in tourism, many other aspects have been impacted severely with the mobile applications aura, positively and otherwise. This shows that the influence of mobile application cannot be disregarded.

The project aims to create a mobile application using Android OS to give a more interactive and exciting way a tourist cannot travel without. The target is for Smartphone users travelling around Perak whether it is intentionally or not intentionally like attending a wedding reception or high school reunion. Besides that, it also aims to redefine travelling experience and tourism spots for better tourist acceptance. It is hoped that the implementation using mobile application is a better approach to citizens, domestic and global. For this project, Perak Tourism is chosen to become the client and as a point of reference.

1.2 Problem Statement

a. Tourists who came to Perak do not know where to go and they are unaware of the 10 icons of Perak announced by Perak Tourism. Those 10 icons need a more aggressive approach in order to let more people know about it. Although advertising effort on marketing those places has intensified through billboards along the highway and mass media publications, a more diversified marketing tool such as utilizing mobile application should also be looked into.

b. Browsing through websites can be an ineffective approach because websites serve every single detail which at some point is not needed by tourist while travelling. Tourists normally just need the gist more than the full content to serve them on the go. The World Wide Web is inevitably the first place people will tend to look in search for information but the amount of information is vast and some Destination Marketing Organizations (DMO) faced intriguing challenges to provide quality information online in an era of information overload (Choi, S, et al. 2007). Very concise and straight-forward information is what is sought by tourists while traveling.

c. Smartphone users are reportedly demanding more travel-related applications which will potentially help them during their travel. Chong, S. (2010) in her article which appears in TechInAsia had pull a poll on user preferences believing that travel-related mobile application would be useful for trip planning. There is a demand in travel-related applications but the implementation especially in Malaysia and specifically Perak's context, is still not popular.

1.3 Objective and Scope of Study

The objectives of TourDroid: Pocket Travel Assistant project are:

1. To study the tourism sector and its potential of incorporating mobile application as a mean to provide services to tourists.
2. To conduct research on the best platform for development.
3. To develop an application embedding several key functionalities.
4. To conduct usability testing on the developed prototype.

The scope of study focused on the development of mobile application that can provide user with predefined suggestions of fun activities to do at iconic place while traveling. These suggestion came from cross referencing activities done between favourite and popular tourist website like TripAdvisor, TripIt, WikiTravel and virtualTourist, just to name a few. This project focuses only places in Perak covering the top 10 icons announced by Perak Tourism for its Visit Year in 2012.

Since the project is technology based, the author need to do extensive research about the latest trend and behavior of users in different environment with regards to what technology can offer. The most suitable platform to develop this application has also been specified and validated as the project goes along.

1.4 The Relevancy of the Project

The implementation of TourDroid is relevant to the future of tourism as it is aimed to redefine traveling experience and help users who are not familiar with certain places to savor the moments of visiting. This would be able to help users to fully utilize their vacation and regret nothing upon departure to their respective hometown. For the time being, the author is going to provide the checklist of activities to do in Perak state in conjunction with the Visit Perak Year 2012.

1.5 Feasibility of the Project within the Scope and Time Frame

The application shall be completed on time as the author has 2 semesters to complete the whole project. The time span of two semesters is divided into two parts, the report, and implementation. During the first semester, the author focuses more towards the research and the report whilst during the second semester; it is the time for the project design and implementation. This is very crucial moment where the author needs to be able to come out with a working application.

CHAPTER 2

LITERATURE REVIEW

2.1 Definition and Effects of Tourism

Tourism is defined as “*An activity essential, to the life of nations because of its direct effects on the social, cultural, educational and economic sectors of national societies and on their international relations*” (WTO, 1995). This sector is one of the main contributors of the national Gross Domestic Product (GDP). In 2010, Tourism sector alone accounted for almost MYR 57 Billion in receipts and attracted 24.6 million tourists from across the globe (Tourism, 2010). It is by far, the highest statistic for tourism in terms of tourists’ hits and receipts for more than a decade. Tourism sector is a critical source in keeping the nation’s economy running as foreign exchange keeps flooding into the country and filling up the deficit holes made by the nation’s spending. According to World Travel and Tourism Council, 11% of the worldwide GDP is contributed by Travel and Tourism. That means, 1 over 10 of the world’s activity is already covered by this sector. For Malaysia’s case, it’s a cash cow. Worldwide, the industry owns 234 million jobs and more than 8% of the total of its employment (Blanke & Chiesa, 2007). This sector is information intense industry and it is a more ‘search product’ than ‘experience product’ (Beirne & Curry, 1999). As of Perak government’s concern, tourism are divided into several categories, (1) historical and heritage, (2) homestay, (3) island & beaches, (4) arts and culture, (5) museums and memorials, (6) places of worship, (7) recreational parks and (8) theme parks (Perak Tourism, 2011).

2.2 Tourist Activities and Spending

Tourists would be spending a lot of money when they are on a particular holiday. In fact tourists are among the largest investor abroad because they brought in foreign currency that would be able to generate good income surplus for a country (Shapiro & Sarin, 2007). In 2010, 12 million Russian citizen went abroad for vacation and average of \$2,200 are spent by each person that makes up \$26 billion are being spent during a vacation (Romasheva, A. 2011). Festive season also made tourist spend money up to the ceiling. It's the time for most of them to celebrate without hesitation and worry. Latest report by Global Refund, a company specializing in tax-free shopping for tourists indicates that in France, Chinese tourists had ousted the Russians by spending a total of 112 million euro, 43 million euro more than the Russian spending (China Daily, 2010). Spending spree always happened during a vacation and it is vital for a nation to work on the effort of establishing good tourism spot in order to attract more visitors and tourists to invest their money. In the case of Perak, there is a place called Kuala Kangsar situated in the bank of the Perak River. The place is well known for its crafts and arts creation. Most of the entrepreneurs working on the crafts famously known as the "Labu Sayong" are the native people of Kuala Kangsar. By increasing the amount of visitors to visit the crafts and arts hub of Perak, these entrepreneurs would be able to make a lot of money and improve their social well-being as an entrepreneur and craftsmen.

2.3 Marketing Reality

Behind a good place for a tourist attraction, there is an aggressive effort in positioning the market and promotion. Here comes the most important part behind the success of any favorite spot for tourists, the marketing strategy. A decade ago, companies and organizations have had the freedom to decide what should customer put as their wants and need as well as how they deliver it to their customers. The internet changed that. In recent years, the traditional marketing is gradually changing to a more advance level which requires less effort but more on techniques, expertise and skills which gives the customers more buying power. Traditional media such as television, newspaper, radio and magazines are one-way, static broadcasting technologies. Marketing strategy via internet is now so popular that made these traditional media faced a steep decline in 2009 with newspaper (down 18.7%), television (down 10.1%), radio (down 11.7%) and even magazine (down 14.8%) (Clifford, S. 2009). Meanwhile, digital advertising is going to reap big year-end bonuses as they are expected to increase their advertising dollar which include mobile (up 18.1%, to \$ 1.3 billion) and the Internet (up 9.2%, to \$23.8 billion) (Suhler, V. 2009). Things have changed so rapidly these days with advancement of Information and Communication Technology (ICT).

2.4 Traditional Marketing, Trends and Setbacks

The traditional way of marketing is not just inefficient but requires a lot of effort with unfavorable returns while digital advertising requires less manpower, less effort but with far greater rate of return. In the United States, 47% of broadcast television viewers say, they would rather pay for an ad-less programming which means they would be more than happy to burn a hole in their pocket just to avoid ads (McClellan, S. 2009). Advertisement on television is considered to interrupt people from watching their favorite series. The significance does no longer exist for this type of marketing strategy. This pandemic cannot be good for any marketing agency around the globe but to find the solutions to this quickly. Smartphone users, on the other hand have increased day by day and these users are able to have accessed to the internet at the tip of their fingers. In 2009 alone, the penetration of Smartphone in the US increased 25% and 14% of mobile phone shipments were Smartphones (Sharma, C. 2009). It is expected that by the end of this year, 2011, the sales of Smartphone is going to surpass desktop personal computers (Snol, L. 2010). There is no need for a direct selling marketing strategy no more. Other than it wasted a lot of time, manpower need is also one of the setbacks. This shows that non-mobile marketing of any kind is no longer a purple cow for the industry and marketer should find other efficient and more competitive way to advertise and market their product.

2.5 Birth of Internet as Advertising Tools and Information Technology (IT)

The birth of the internet has also caused Internet marketing to be one of the best marketing tools available (Kuo-Qin & Yi-Ping, 2011). It has fundamentally changed the way consumers obtain and process information (Ghose & Yang, 2007). Not only because it works 24/7/365 but the rate of accessibility cannot be doubt no more. These marketing tools are not just fast or easy but sometimes it is also free of charge! There are also cost risks in any advertising venture and sometimes well-designed website, banner and even microsites have got price to pay. These advertisements worth the investment as their presence in any website on the internet are significant. The management of an organization which is going to involve in these types of advertisements must have been doing a lot of homework to ensure handsome rate of return. In fact, search engines like Google, Yahoo! and Bing are paid fees by advertisers for displaying their advertisement alongside web search result. The global paid search advertising market is making lots of money and predicted to have a 37% of compound annual growth rate (CAGR) causing them to reap more than \$33 billion in 2010! (Ghose & Yang, 2007).

2.6 The Rise of Mobile Application

During the birth of Smartphone, there established an entity a person cannot live without. It accompany the users wherever they go and people connected gets important updates each and every time the users stumble upon something new like going to a new place, meeting a long time friend and eating at a famous restaurant. This new lifestyle keeps people updated 24/7. The feeling of wanting to stay in touch with friends and loved ones even without their presence is very much alive. Hence, this is a psychological advantage that Smartphone's providers have got to gain advantage on their side. Foursquare is one of the most prominent location sharing systems developed although similar applications have existed for over two decades (Lindqvist, J. et al, 2011). As of April 2012, Foursquare Inc has claimed that it has more than 20 million members and counting (About Foursquare, 2011). In a period of only four months (from December 2011 to April 2012), foursquare has increased its number of users four-fold from 5 million to 20 million. The question is why this mobile application can attract so many people to use it while at the same time it jeopardizes their own privacy? Past research has already proven that privacy has become one of the most prominent reasons why people put a barrier to adoption of location sharing services (Barkhuus, L., et al. 2008). However, large numbers of users were having the impression that privacy concern cannot be the one keeping them from experimenting the trending technology boom (Lindqvist, J., et al. 2011). Furthermore, with the new strategies that the developers have come out with to protect users' privacy is seen as a significant move.

2.7 Mobile Application and Tourism

Recent trend of mobile apps boom has made tourism agencies and even governing bodies thinking on how they can value add people on the go. Nowadays any countries have taken the advantage of social media boom and IT to make their tourism sector flourish. Among these countries are Australia and Vancouver, Canada. Australia is a nation which practically very active in engaging its citizen with social media which in this case, Facebook. The main objective of the establishment of the social media site is for Australia to serve as a hub for people who are planning to visit, have visited, or simply have a great love for holidays in Australia (Tourism Australia, 2010). The site provides general information, tips on travelling, images sharing and video posts that are very interactive and fun. The Australian Facebook page for tourism has attracted almost 2 million people and 35,423 users of Facebook had discussions or talk about it in their posts (Tourism Australia, 2011). Vancouver, on the other hand, which is going to be the main focus of this part of literature, has launched a mobile application in the form of interactive tourist guide with the integration of street navigation of Vancouver and Whistler (Chong, S. 2010). The mobile application has been replicated into popular operating systems which include Android and Apple iOS. Thousand of downloads have shown that this application is loved by users and high acceptance in terms of its usage and functionality (Tourism Vancouver, 2011). There are a lot more mobile applications to help users especially in location tagging and sharing. TripAdvisor is one example of user generated content and travel. It is a US-based company which already went public IN 2012 and traded on NASDAQ just by providing a travel website (Boston Globe, 2011). TripAdvisor provides guides at places of choice, reviews on hotels as well as list of exciting places to do. It is also map-integrated which it locates where the user is and help the user find nearest places of interest. From utilizing the World Wide Web as a mainstream internet media during the late 1990s, tripAdvisor is already one step ahead by utilizing mobile application into its products and services.

2.8 Android Operating Systems and Its Mobile Application Market Share

Android OS is open source software which is governed by The Android Open Source Project (AOSP) and is tasked with the maintenance and the future development of Android (Wikimedia Foundation, 2011). After the infamous Google Inc bought over Android Inc in 2005, the Android OS has grown rapidly to have helped a lot to the future of Smartphones (Business Week, 2010). Apparently, Android Operating System (OS) market share has surged over 56% leaving the closest competitor, Apple Inc with its iOS at 33% (Blodget, H. 2011). This is a proof that Android is going to have a huge amount of user leaving all of their competitors behind. While Android is going to conquer the Smartphone market, it is seen as a smart move to use Android OS in developing mobile applications. The sales of its Smartphones already showing good trend when Android Smartphone sales ousted iOS (Apple) Smartphones by 56.1% to only 22.9%! (Gartner, 2012). This shows that the popularity of mobile applications are still with Android and even with the next half a decade of prediction, Android is still on top. Android on the other hand has a handful group of developers developing applications for Google Play, a market where each and every application are uploaded and downloaded. Applications in Google Play now has reached 600,000 and counting which includes applications and games (Constine, J., 2012). At this Google Play, besides enabling end user to download cool applications and games, it also displays the comments, and details about the applications developers. Hence, a communication between developers and soon-to-be developers can be established. The possibility of developing mobile application in Android environment is endless and since the developer's community is now growing extra fast, it is going to be more convenient and better sources of references.

CHAPTER 3

METHODOLOGY

In general, research methodology refers to a set of procedures used to conduct a research project. As the project's title suggest, the development of TourDroid will be discussed phase by phase in System Development Life Cycle (SDLC).

3.1 System Development Methodology

This project is going to be developed using Rapid Application Development (RAD) as extensive pre-planning is not necessary and the software can be written much faster and makes it much easier to change in case there is any (Whitten, L., 2003). The figure below shows the RAD model to implement the SDLC.

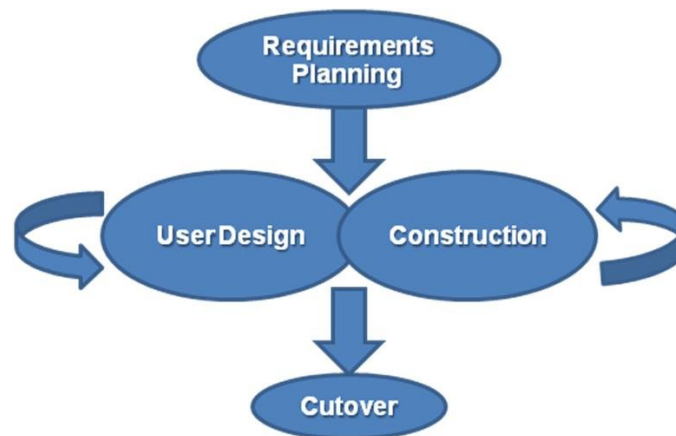


Figure 3.1: Rapid Application Development (RAD) Model (Toletol, 1992)

For this project, RAD is the most suitable model to be used because it promotes a dynamic gathering of requirements and very strong collaborative atmosphere. The client who in this case Perak Tourism can be involved in prototyping as the development is going to cater their needs as well. The intervention from the client is very important as RAD may require the prototype to change from time to time. The phases included in this project will be planning, analysis, design and implementation.

3.2 Project Planning and Feasibility Study

This phase involved with a lot of research about tourism, marketing, Android OS and mobile application which has high hits among Smartphone users. Reviews from journals, research papers as well as internet sites were made as part of the research to strengthen the knowledge about the subject of this project and the research scope. The main resources of journals and research papers come from ACM provided by UTP Information Resource Centre (IRC) and IEEE website www.IEEE.org. After reading and comprehending research scope, a Gantt Chart has been done to keep track the project timeline. This is to ensure enough time is given for specific task and project would be able to be completed in a timely manner.

For feasibility study, Perak Tourism, the main client or subject matter expert (SME) for the project, has been contacted and managed to talk to the CEO of Perak Tourism, Mr Fathil Ghani. A meeting and discussion has been made to get to know what is the main problem faced by the organization and ways they would conduct their advertisement and marketing in conjunction with Visit Perak Year 2012.

The discussion has come to a conclusion that the top 10 icons of Perak has already been properly introduced or announced by Perak Tourism but the awareness of people in Perak is still at a very minimum level. However, it has been explained in detail in Perak Tourism website at www.peraktourism.com. The only problem discussed during the meeting/interview is that what tourists shall do once they are already at the designated icons. Some suggestions can be obtained in websites like blogs or even social media but the only problem is it is not integrated and the info is scattered between cross platform (blogs, social media etc.) . As the main purpose of TourDroid is to help fellow tourists to savor their travelling experience by providing a bucket of checklist of fun things to do, the idea has been accepted unanimously.

Collaboration with Perak Tourism is seen as a great move as this project would be having a guide and expectation from the client. It is measurable as Perak Tourism as advisor would be able to communicate and be involved directly with the project in terms of supervision and constructive comments about contents.

3.3 System Analysis

After planning activities have been done and agreement has been achieved between the involved parties, several analysis should be made in order to validate each planned activities and at the same time strengthening it. During the analysis phase, several steps are taken into consideration.

- Interview and surveys have been done and distributed to gather information about perceived expectation while travelling to potential tourists and travelers.
- The author analyzed current applications (mobile applications) related to tourism and see how does it work, and how does it affect the behavior and acceptance to users.
- The author went to almost all 10 icons of Perak and collect useful information to create a bucket of checklist of fun activities or a must-do at each icon.

3.4 System Design

The design phase requires the author to put what has been planned into graphical user interface (GUI), the conceptual, physical designs as well as the system architecture of the said application. The design is made from the result of data analysis. This is vital because the design has to be valid according to what users prefer and the nature of the scope.

3.4.1 Graphical User Interface

Graphical User interface is the core of the application where as a tourism application; it has to capture the interest of the user to use it. Before programming starts, the logic and the positioning of the interface has to be able to facilitate the users relationship with the application. The design prototype in the form of GUI has to be produced on a paper-based design. The design on paper then shall be evaluated by the users. User's responses and comments towards the state of the interface should be included in analysis to improve the application.

3.4.2 Conceptual Design

The conceptual design here is where the author creates logic of the application flow by using UML diagram which consisted of package diagram and flowcharts. Package diagram contains use cases to illustrate the functionality of the software system while the flowcharts shows logic of the application and to enable the author to track where the button click goes when initiated. In this conceptual design, the author uses Microsoft Visio 2007 to illustrate the functionality and to see working classes and component in the application.

3.4.3 Physical Design

The project is going to be developed by using author's personal computer with the aid of chrome browser to enhance the usability of the software to create the application. To design the GUI, the author needs to use Adobe Photoshop and picture editing applications. On the other hand, for the development in Android development, an Android emulator is needed to test each screen upon completing it via installation of Android software development kit (SDK). The table below shows the specification of the project development.

Tools	Specifications
Hardware	A Samsung Galaxy Tab 10.1, Samsung Galaxy S2, Acer notebook
Software	Google AppInventor Software, Illumination software, Android SDK, Adobe Photoshop, Google Chrome browser.

Table 3.1: Development Environment Specifications

3.4.4 System Architecture

The TourDroid is a standalone application with the integration of database. The database is used to store each selection the user has made and allow it to be retrieved back by the user anytime the user use the application. In this application using the AppInventor, tinyDB is used by the author. This is to ensure all the data is not lost when the user exited the program and re-launched it.

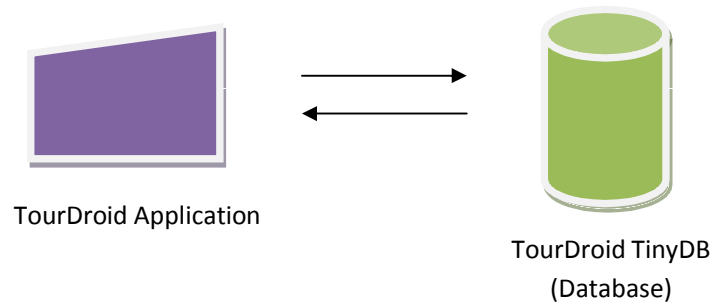


Figure 3.2: TourDroid System Architecture

3.5 Implementation

The final phase of the project development is the implementation phase where the author test and implement the completed application before it can be delivered to the intended users. The completed version is going to be the enhanced version of the prototype based on the feedback and comments from the identified audience and users. The feedback of the users is so important that every comment lead to the improvisation of the application which includes the aesthetic value and functionality issues. The major part of this phase brings a lot of technical works in working with codes of the AppInventor software.

3.6 Project activities

The beginning of the project is focused on the theoretical readings and understanding of the project scope. The same goes with familiarization of the Android environment which includes the usage of the mobile application creator namely AppInventor and Illumination software. Several activities have been done in making sure this project a success. A lot of investment has been made to ensure the

information provided in this application is reliable and will bring good impact to the users.

a. Survey and Questionnaire

Survey questions have been developed and distributed to almost 30 respondents. The main purpose of this survey is to support initial hypothesis that the author has set for this project development. For every question, there goes back to the need of supporting one hypothesis. In the survey, the author also included questions on Technology Acceptance Model, a model that this project has been used to study how user come and use a technology (mobile application). The outcome of this survey has contributed to a holistic development of TourDroid components.

b. Interview and Discussion

Interviews play a very important role in each and every aspect of the development in this project. The idea of coming up with an Android application needs advise from current Android developer to know what does it takes to develop Android applications. Interviews with some Android developers helped a lot in motivation the author to continue developing the application using a handful of software at first and eventually adopt Google AppInventor as the main environment for software development. Besides that, interview with the officers in the Perak Tourism provided a lot of information and clarification on how to go about delivering this project. It has given the author a lot of motivation to continue with this project when it seemed that Perak Tourism is supporting this initiative.

c. Literature review

Literature review is done to discover and understand current situation and latest requirement or necessity in Tourism and Android application environment. This is to summarize the depth evaluation of research area that helps in this project development and enhancement. Literature review

in this project does not only revolve around research papers and theses but from the analysis of renowned IT publications which covers a lot on Android application environment. This could lead to better ideas to be implemented in this project.

d. Site visits and data collection

Site visit and data collection are amongst the most important activities in this project. A lot of investments in terms of time and money have been injected in order to fully understand the scope of the project. About 7 out of 10 icons of Perak have been explored and detailed with fun and exciting activities have been recorded to complete the design of the mobile application. In order to create an application to suggest activities to do at each place in the mobile application, the author strongly believe a personal effort must be put forth in order to gain more reliability and satisfaction upon the launching of the mobile application.

e. Designing application in Android environment.

This activity is by far the hardest in the beginning. The author, who has never been exposed to any Android environment mobile apps creation, finds it hard to start the ball rolling. Nevertheless, with the existence of online developers forums and online tutorial have made the learning fun and exciting. However, there are still lots of room for improvements in terms of design and functionality using the software.

3.7 Key Milestone

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

Semester 1

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

Table 3.2: Key milestone for FYP I

Semester 2

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

Table 3.3: Key milestone for FYP II

3.7.1 Gantt chart

	Items	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	W13	W14
		21/5 - 25/5	28/5 - 1/6	4/6 - 8/6	11/6 - 15/6	18/6 - 22/6	25/6 - 29/6	2/7 - 6/7	9/7 - 13/7	16/7 - 20/7	23/7 - 27/7	30/7 - 3/8	6/8 - 10/8	13/8 - 17/8	20/8 - 24/8
Planning	Discussion with SV														
	Prepare/ edit Gantt Chart														
Data collection	Interview with social traveller/tourists														
	Distributing survey questions														
Data analysis	Data compilation and result identification														
	Data documentation														
System analysis	Understand the current tourism websites														
	Evaluate the feasibility of proposed system														
Design and development	Draft the system flow														
	Design system components														
	Design system prototype														
	System testing														
Important dates	Evaluate the system														
	Progress report														
	Pre-SEDEX														
	Dissertation														
	VIVA														
	Final dissertation														

Table 3.4: Gantt chart

3.8 Tools

3.8.1 Tools used (Software)

- 1) Google AppInventor (Beta Version developed by Google Inc but now maintained by Massachusetts Institute of Technology)
- 2) Illumination Software (Linux Kernel Version 1.67)
- 3) Microsoft Office 2010
 - a. Microsoft Visio 2007
- 4) Android Software Development Kit (SDK)
- 5) Google Mail (gmail) – for survey purposes
- 6) Windows 7 Home Basic Operating System

3.8.2 Tools used (Hardware)

- 1) Acer Laptop Aspire 4920
- 2) Samsung Galaxy Tab 10.1 (HoneyComb 3.0)
- 3) Samsung Galaxy S II (GingerBread 2.3)

CHAPTER 4

RESULT AND DISCUSSION

4.1 Data Gathering Analysis

4.1.1 Survey Analysis

Survey Objective

The purpose of the survey/questionnaire is to do a demographical check and preference inclination of the target users towards using the mobile apps and familiarization with Android mobile application in Tourism.

Data Collection Process

The survey has been passed to 30 respondents of different demographical background which includes university students, freelancer and working adults. Survey is conducted online where all respondent were sent a link to Google Docs file which enable them to answer the questionnaire, paper-less. Online survey is chosen due to the go green initiative while doing this project and the ease of use where larger demographical background can be reached with just a single click.

Findings

23 respondents have participated actively by completing the survey within 2 weeks of circulation. The findings of the survey research are as follows:

Section 1: Personal Information.

The objective of this section is to check the type of target group who completed the survey which includes gender and age group. One important information that the author is trying to grasp in this section is whether or not the respondent own a Smartphone which

in this case is very significant because mobile apps can only be played in a Smartphone.

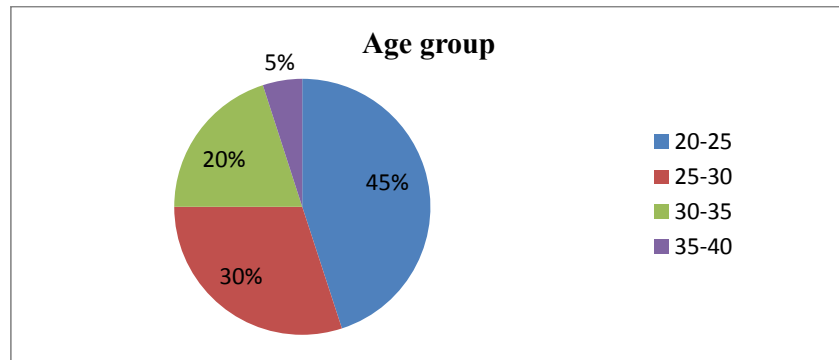


Figure 4.1: Age group

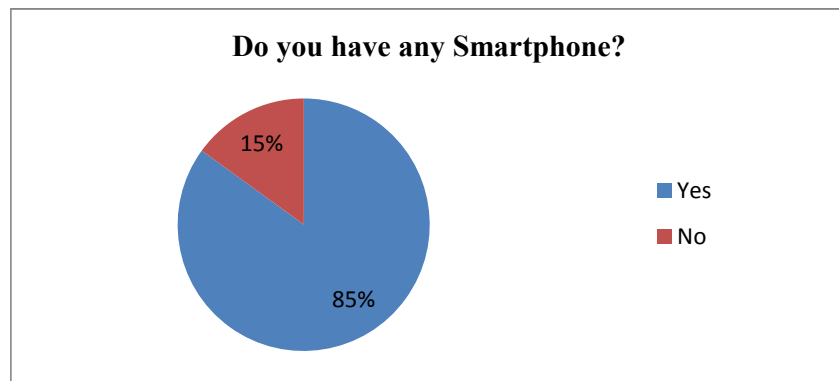


Figure 4.2: Smartphone ownership

Section 2: Traveling preference

This section is aimed to see what are the traits of travelling preference that the respondent practiced and see how the travelling preference can become one of the strengths in the application created by the author. The respondents were also tested about the knowledge of Perak's iconic places and the commencement of Visit Perak Year 2012. This is to see the awareness of the respondent about tourism campaign. *Low cost travel is defined as domestic travel and high cost travel is defined as international traveling activity explained earlier prior to answering the surveys.

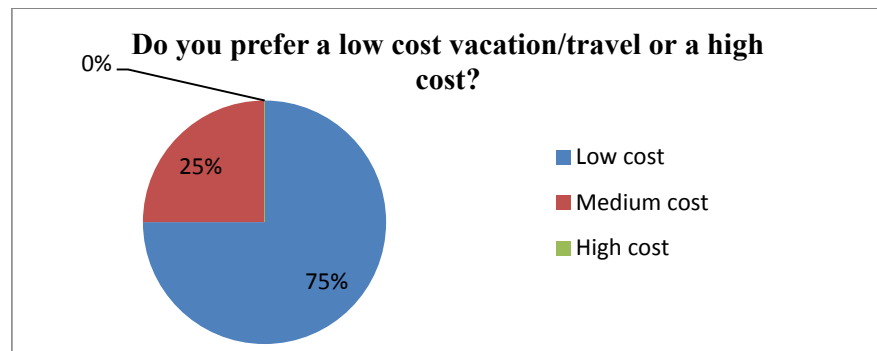


Figure 4.3: Travel cost preference.

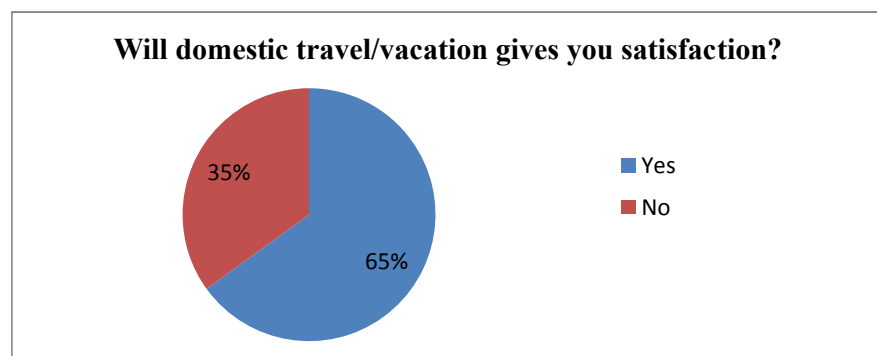


Figure 4.4: Satisfaction of domestic travel.

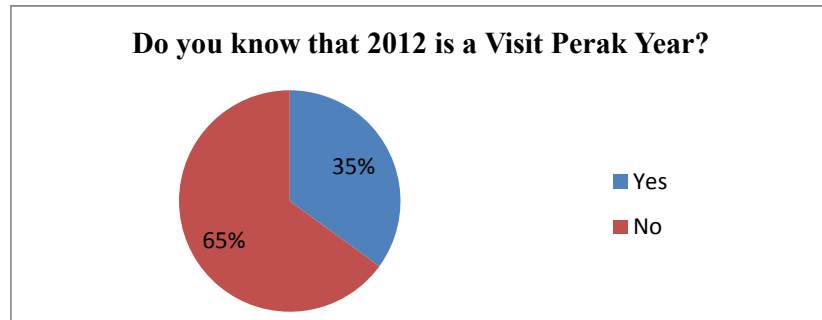


Figure 4.5: Knowledge about Visit Perak Year 2012

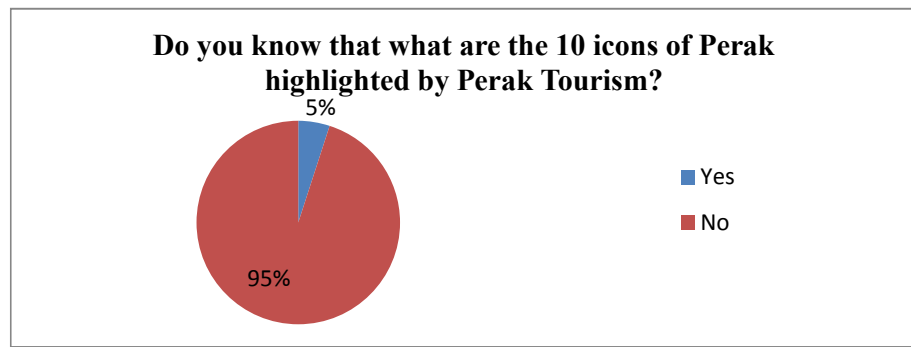


Figure 4.6: Knowledge about 10 icons of Perak

Section 3: Technology Acceptance Model Related

This section enlightens the connection between the developments of the application to the Technology Acceptance Model (TAM) and how are they related. This section discovers two main factors in the decision of users to adopt a technology (mobile application).

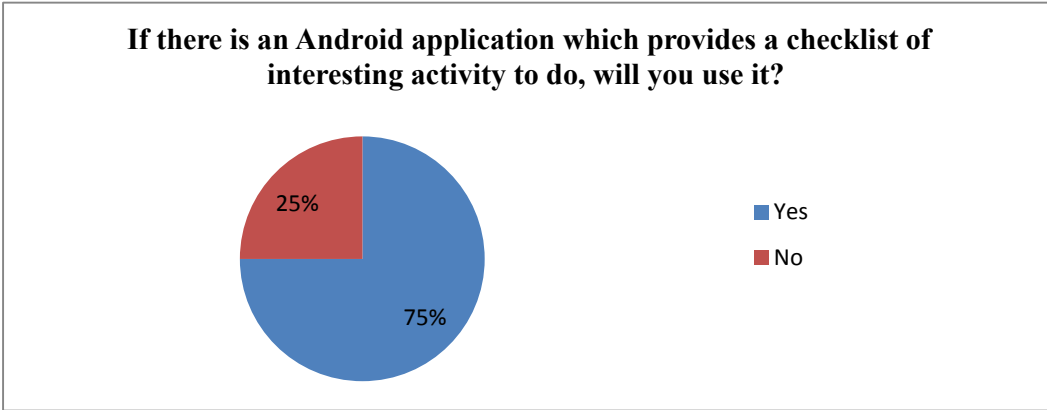


Figure 4.7: Perceived Ease of Use (TAM)

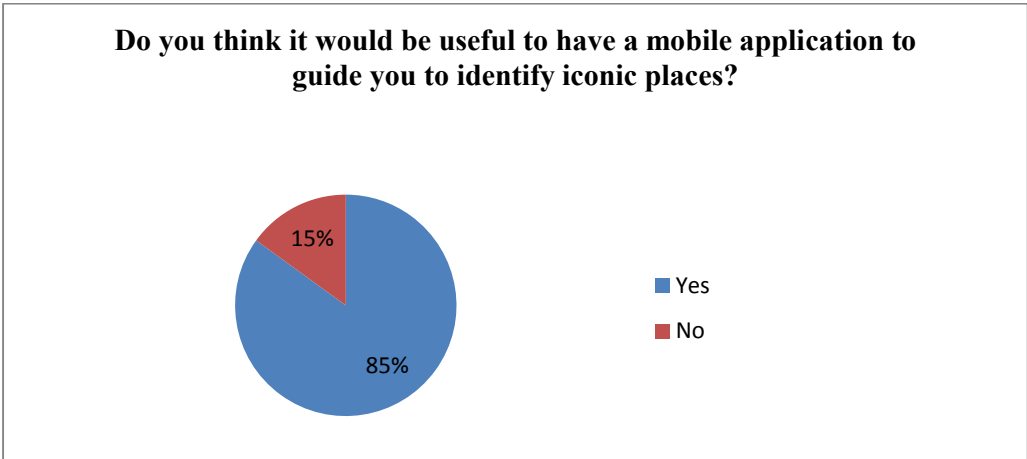


Figure 4.8: Perceived Usefulness (TAM)

Section 4: Validation of proposing a Mobile Application.

This section is aimed to validate the functionality of the proposed application, TourDroid. Opinions and perceptions from the respondents are collected to ensure the application has a valid functionality and serve its purpose.

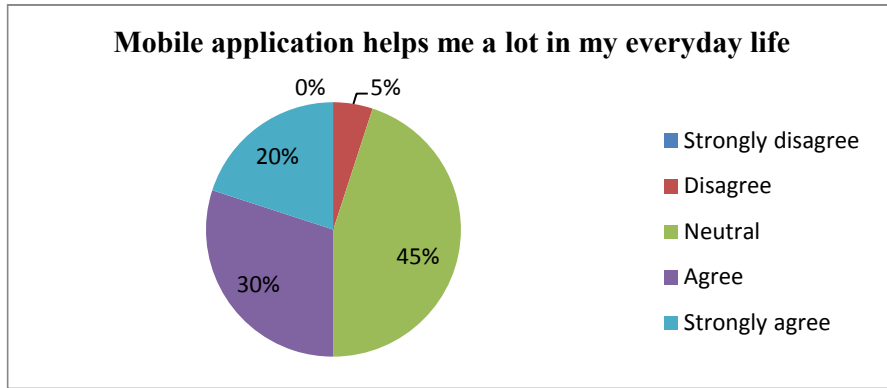


Figure 4.9: The importance of using mobile apps.

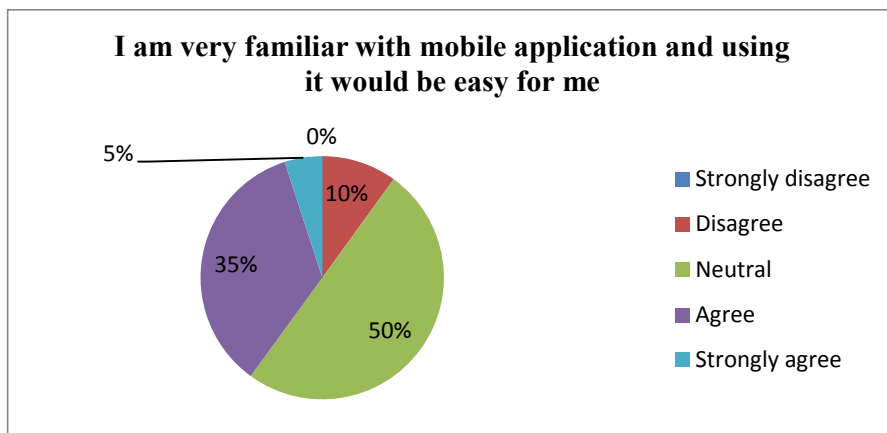


Figure 4.10: Familiarity for mobile application usage.

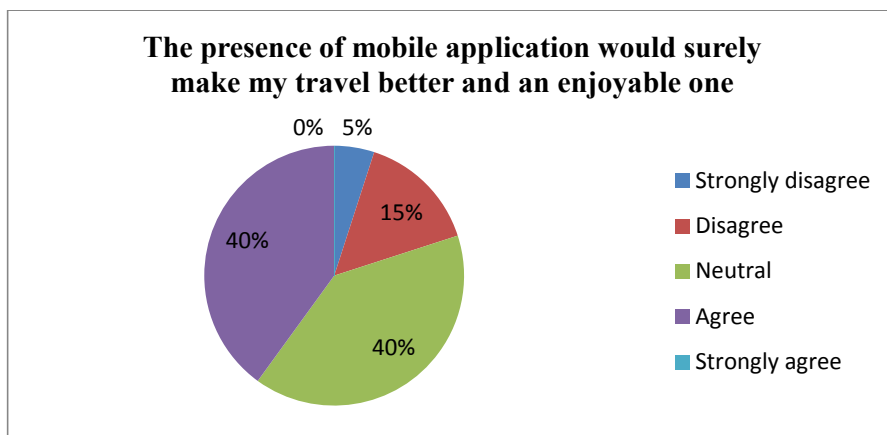


Figure 4.11: Effect of using mobile application while traveling

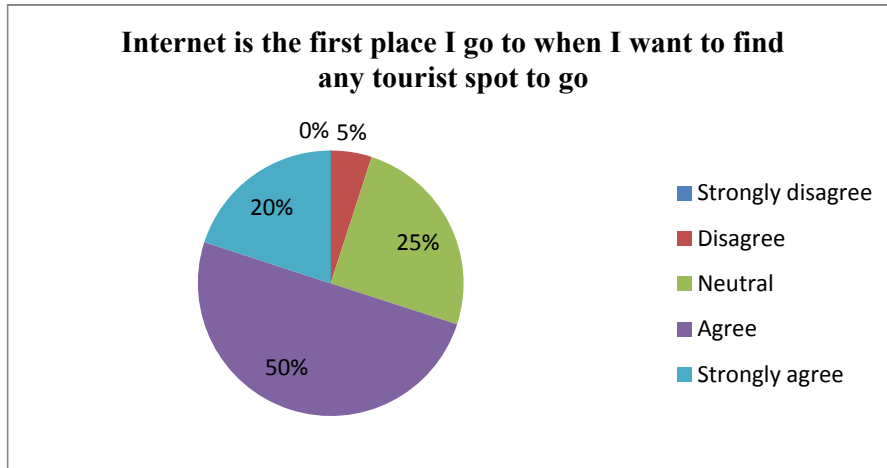


Figure 4.12: Place to find information.

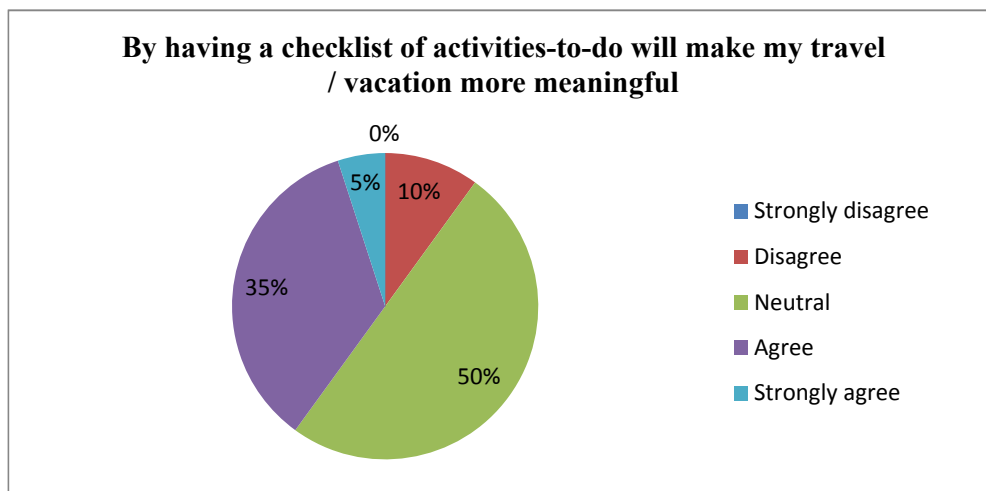


Figure 4.13: Opinion on providing checklist for travel purposes

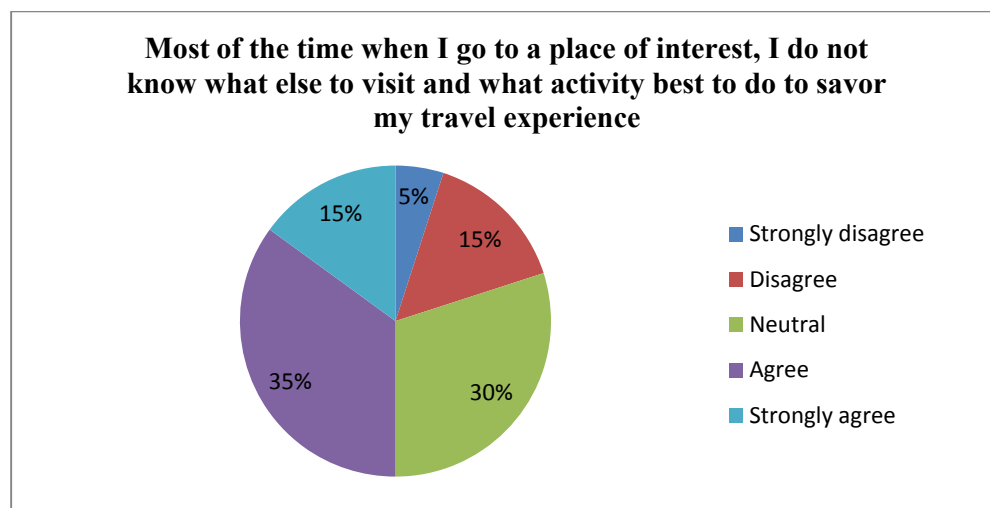


Figure 4.14: Activities to do at places of interest

Vast/overload amount of information in tourism website tends to hinder quality information to be sought by tourists.

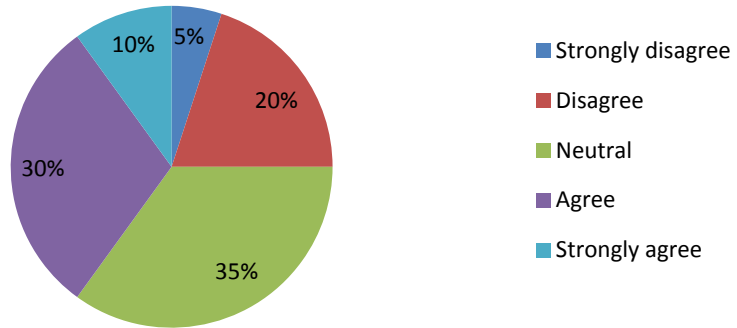


Figure 4.15: Information on the World Wide Web and its drawbacks

Do you find using mobile apps on Smartphone is much easier than opening up a website in search for information?

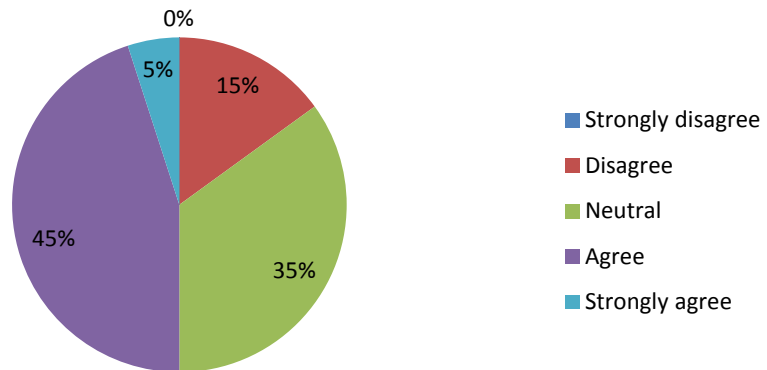


Figure 4.16: Familiarity of mobile apps in providing information

4.2 Comparison of TourDroid with current available mobile application

TourDroid is compared with current available travel assistant application in the market. The application that is compared with TourDroid is TripAdvisor. It is an undeniable fact that TripAdvisor is already a well establish mobile and web app which have received multiple accolades. However, there is still a lot of room for improvements based on this project analysis. TripAdvisor has a very wide range of region covered which primarily focused on America and China. It has moved and covered extensively to each and every place around the globe. TourDroid on the other hand, focuses more towards Perak state in conjunction with Visit Perak Year 2012 as a tool to enable tourist who travelled to Perak to savor their travel experience by providing a checklist of fun stuff to do. In other word, TourDroid is a very specific app that will do a more explicit task in helping Perak Tourism to market the top 10 icons. There are also suggestions in TripAdvisor on what activities to do but users preferred better if there is a checklist where users would find it interesting to complete rather than only a list. Below are the screenshots of TripAdvisor app and some points that can be enhanced.

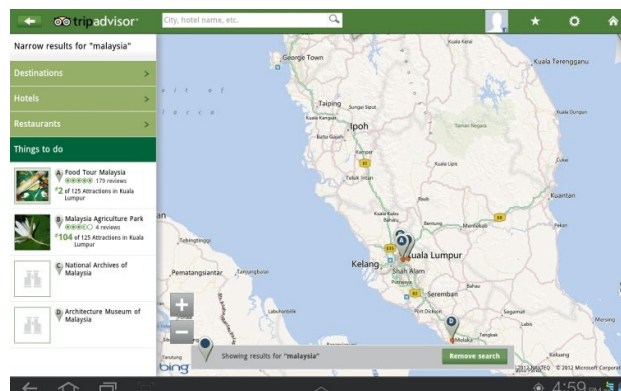


Figure 4.17: Screenshot of TripAdvisor Application.

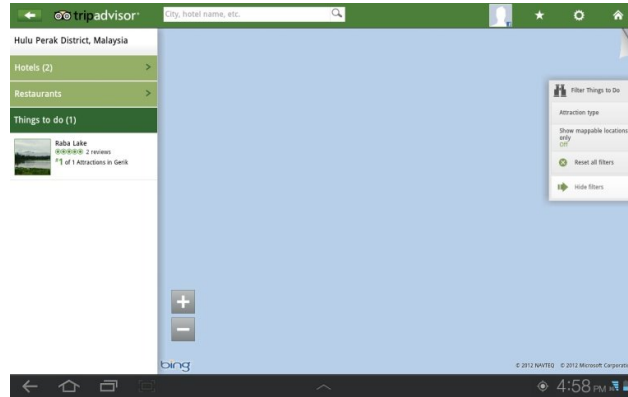


Figure 4.18: Screenshot of TripAdvisor Application.

On the left figure, there resides the selection of “Things To Do” and with “Malaysia” as the prime search, not much can be found out of the interesting places. Let see what if a user search for “Perak” in the figure on the right. Not just the map cannot be displayed due to the explicit nature of the searched place, the list of “things-to-do” also been reduced and seems like irrelevant for tourists. This is where the importance of explicit study that needs to be done to make the application more useful. That is why TourDroid has a more unambiguous and clear objective to develop mobile application for Visit Perak as a start.

4.3 Prototype

The prototype which is called the TourDroid, will be consisting of several main components. Below are the components of the application.

1. Search place
 - a. Users will be shown 10 icons of Perak at the start screen to choose from.
2. Brief Explanation
 - a. Once the user click on any specified place out of the 10, the user will be brought to a screen where some information about the place will be displayed like the history of the place or how did the place get its name. Two options are prepared for users whether viewing it on GoogleMap or view the checklist prepared for the.
3. View Checklist of Things-to-do
 - a. At the bottom of the brief explanation screen, there will be a checklist button which will direct the user to the checklist screen.
 - b. The checklist screen will display all suggested activities or popular activities which can be done at the iconic place.
 - c. At the bottom of the screen, a “Done” button will be displayed and upon clicking the button, users will be directed to the home screen again to choose other iconic place to visit.

4. View on map

- a. This function is a state of the art function offered by Google with integration with Google+, Google's social media site. Users will get to see where those iconic places are located on a map.
- b. The application can also track the current location of the users. The best part is that, users can as well get to know the direction to these places, how far is it and how long will it take to reach there.
- c. By clicking at the place's name, users are able to get reviews (if applicable) and ratings by other users as well. Besides, users are also able to give reviews themselves and express what they feel about the place.

4.3.1 Windows navigation diagram



Figure 4.19 : System flowchart

4.3.2 Use Case Diagram

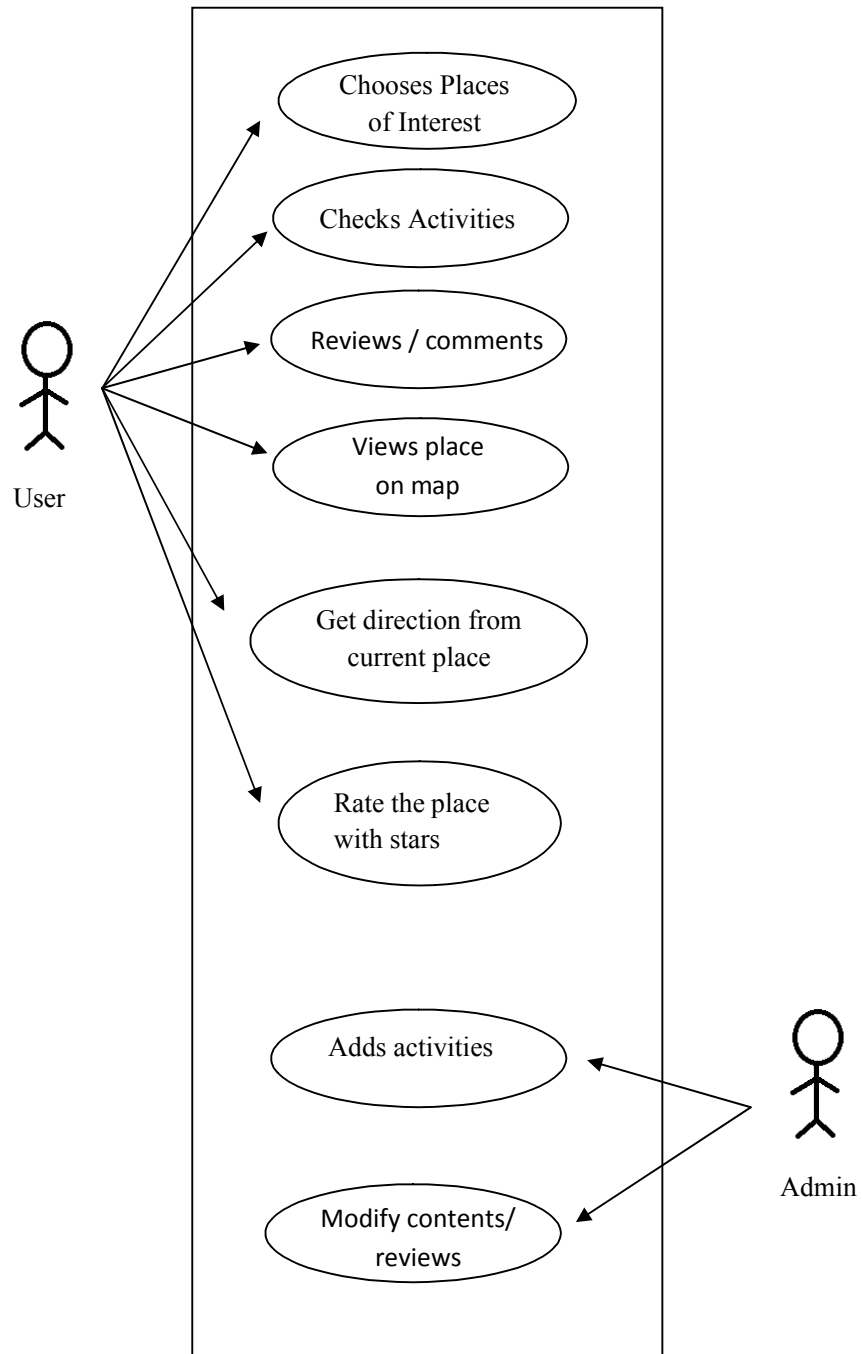


Figure 4.20 : Use Case diagram

4.3.3 Sample of screenshots from Application



(b) Home screen



(a) Information screen

Figure 4.21

Figure 4.22

Figure 4.21 shows the main screen where it acts as a homepage. Every time user runs the application, the home screen will appear first. In the home screen, 10 icons of Perak will be displayed in a 2x5 arrangement. There will be a label to guide user to click any of the place's button to proceed. The figure 4.22 on the right side shows basic description about the place which in this case, Matang Mangrove Forest. An overview about Matang Mangrove is displayed so that user can have basic information about the place before choosing to view the place on map or view the checklist of activity that can be done at the forest.



(d) Checklist screen

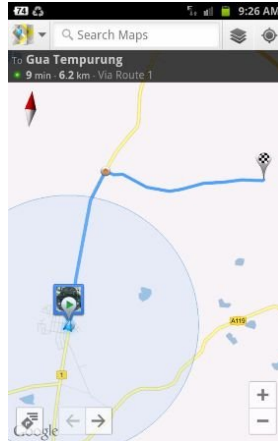
Figure 4.23



(c) Map screen

Figure 4.24

When “View Checklist” button is clicked on the previous screen, Figure 4.23 will appear. A list of suggested activities will be displayed in a form of checkboxes. Users will be able to view all the activities and checks them once the activities have been performed and otherwise. When “Save and Done” button is clicked, the changes on the checkboxes are recorded and will be stored in the database within the application which stays even if the device is turned off. On the other hand, when “View on Map” button is clicked on the previous screen, Figure 4.24 will be displayed. In this case, if the user clicked on “Gua Tempurung” button, the application will find the location of Gua Tempurung on map. The map is powered by GoogleMap where the credibility of its accuracy is valid and trusted.



(f) Direction screen

Figure 4.25



(e) Review and comments

Figure 4.26

Figure 4.25 displays direction from user current location to the select place. The application will detect user current location and gives information such as distance to location and time taken to reach the destination. This application utilizes Global Positioning System (GPS) and provides accurate position within 1900 meters. Users are also able to see reviews and comments about selected destination when they clicked on the place name. Photo sharing is also enabled in this application where users who have Google+ account are able to share photos within the friends' circle. Ratings can also be given upon completing a journey. This provides users with more interactivity and perhaps will make the application friendlier to users.

4.4 Connections with Technology Acceptance Models (TAM)

The proposed application is based from the analysis of Technology Acceptance model introduced by Fred Davis et al (1989). TAM is an information system theory that models how user come to accept and use technology which in this case, the Android mobile application. Davis (1989) reported that there are two very important factors that can influence a user to use a technology which are perceived usefulness and perceived ease of use. Due to that, the purpose of the author trying to find connection between this project and TAM model is to strengthen the point of this mobile application proposition. The TAM model is further explained in the figure below:

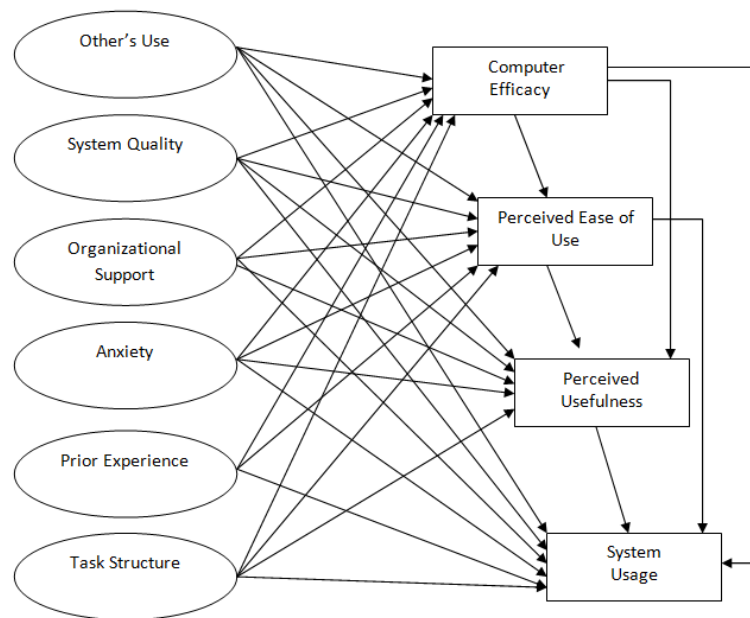


Figure 4.27: TAM Framework (Venkatesh & Davis, 2000)

Questionnaire distributed to respondent also contained some questions with regards to TAM. This is to ensure that users find the application is useful and makes their task, which in this case, travel, much easier. The sample of the pre-implementation survey can be found in the **appendix 1** at the end of this paper.

No	Test Case Name	Test Procedure	Pre-Condition	Expected Result	Reference to Detailed Design/ Spec Document	Results
1	User_Place_btn	Click on any of the 10 places button	None	Direct user to information screen displaying briefly about the place of choice	User Module	Pass (all 10 buttons)
2	User_map_btn	Click on “View on Map” button	None	Direct user to GoogleMaps where it display pre-determined location of the place of choice	User Module	Pass
3	User_checklist_btn	Click on “View Checklist” button	None	Direct user to list of activities at the designated place	User Module	Pass
4	User_activity_chkbox	Checks and uncheck activities at place of interest	None	User would be able to check and uncheck activities in the representation of checkboxes.	User Module	Pass
5	User_Save_btn	Clicks on “Save and Done” button	None	Saves all checkboxes which have been checked or unchecked even when application is closed	User Module	Pass

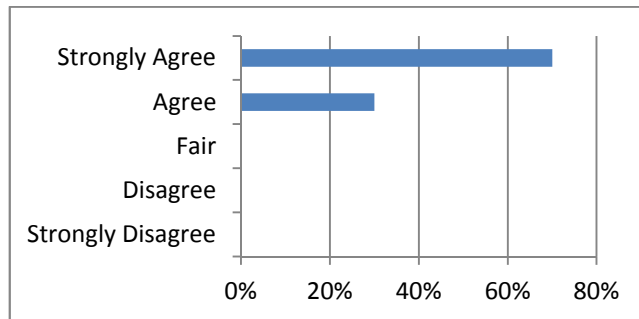
Table 4.1: Integration Test Plan result

4.5 Post-Implementation Survey

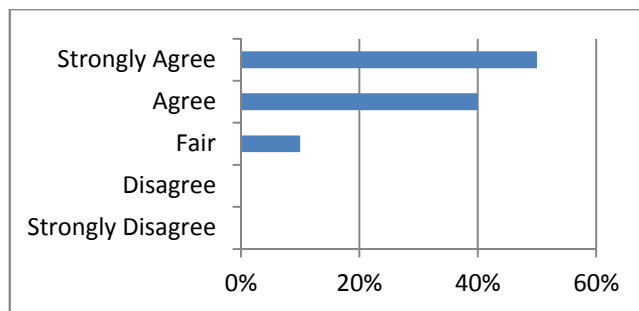
The author had conducted a survey for the TourDroid prototype in order to evaluate the effectiveness of the prototype. This survey is a continuity of the initial survey the author did during pre-implementation. The survey contains nine (9) questions which enable respondents to rate and evaluate on the user-friendliness, information wise and usability of the prototype. There is also one (1) open ended question for the improvement of the prototype. Refer appendix to obtain the survey form.

Below are the result gathered from the survey:

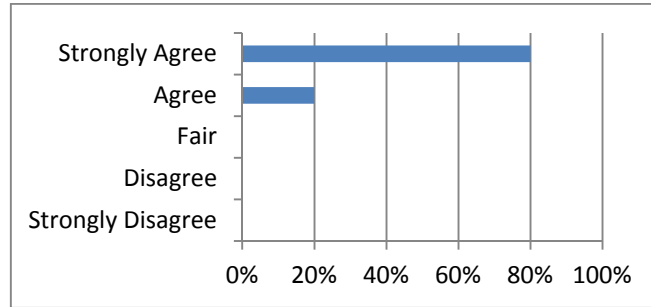
1. The graphical user interface of the application is user-friendly.



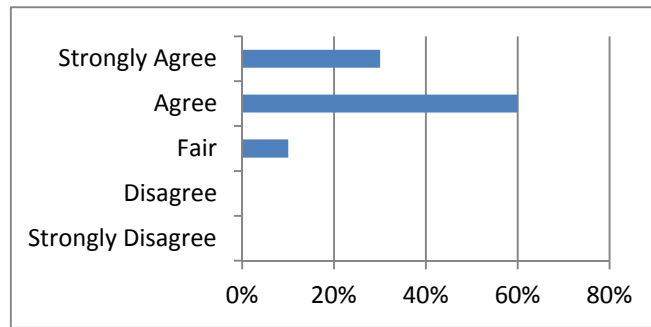
2. It is easy and understandable to navigate through the whole application.



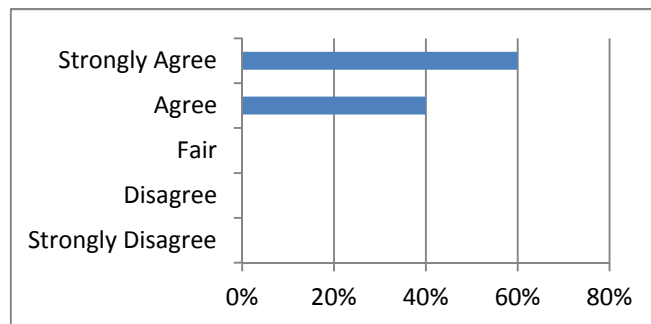
3. TourDroid helps people to identify 10 iconic places in Perak easily.



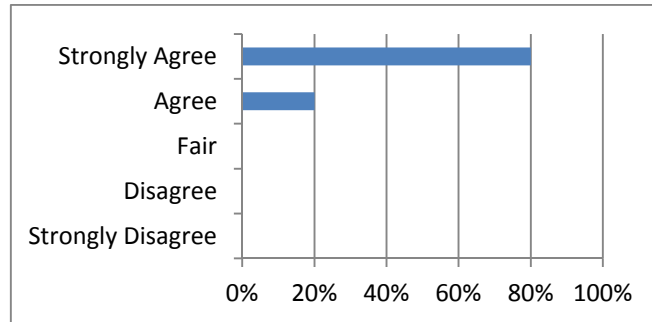
4. I found that TourDroid application is an interactive application that makes tourism more exciting.



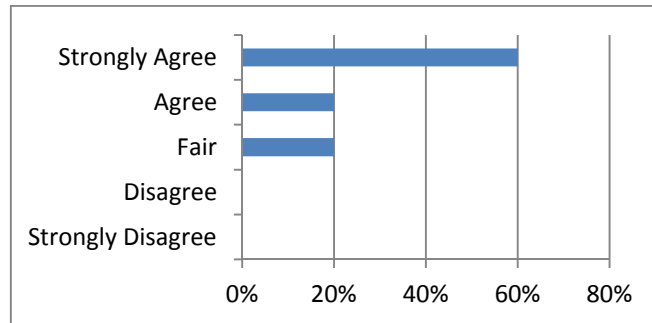
5. TourDroid is very useful in providing information about interesting place in Perak.



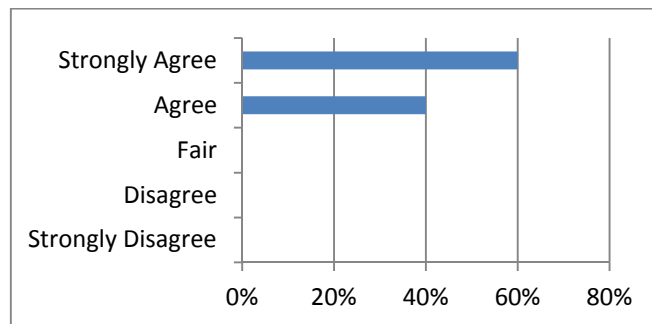
6. TourDroid is able to ease the way tourist travel by the integration of GoogleMaps.



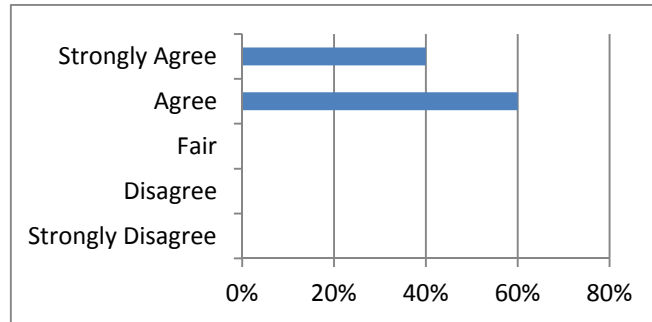
7. TourDroid helps me a lot in suggesting activities to do at iconic places by providing a checklist that I can check every time I finished an activity.



8. By using TourDroid, I don't have to worry about missing an activity at a destination of choice because TourDroid's checklist keeps me updated.



9. TourDroid is able to make me truly savor my visit to iconic places and redefining my travel experience.



In a conclusion, based from the feedback of respondents, TourDroid is something new in increasing the interactivity thus redefining traveling experience in Perak. There are also some suggestions to improve the application in the future to make it more interesting and catchy. Among the improvements suggested are, connect it to the web so that updates can be done in real time by participating places of interests, integration with a more popular social media sites like Facebook, Twitter and Foursquare, more pictures or videos to be shared with other users of the application.

CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.1 Conclusion

In a nutshell, TourDroid is able to be functional and fulfill its objectives as discussed in Chapter 1. The author has successfully conducted researches about mobile application market, its potential and the correlation with tourism industry. The best technology platform has also been successfully identified and better understanding has been established by series of interviews and surveys. Analysis and design phase of the system has also been completed. The UML diagram, use case and flowchart had been designed to gain a clearer view on how the application works and should work. The application undergone few cycles of prototyping before the author is able to come out with a finalized prototype. During the testing phase several users have present and willing to give comments towards the betterment and improvement of the project.

This application has been taken to the field to test its effectiveness and it has helped the author at 4 different icons of Perak. TourDroid has helped in getting to the place and provide activities to be done so that the travel would become more meaningful. The fact that TourDroid provide checklist for the users to keep track their activities, tremendously helped tourists to come up with a virtual travel logs at different places. Therefore, the application is expected to increase the efficiency of the traditional traveling experience.

5.2 Recommendation and Future Work

The first recommendation for this application is to make the information in the application is able to be modified in real time or in other word, to make this application relies totally on web. This would benefit a lot to let tourists be updated with changes

happening in the state. It also helped the developer to outsource the maintenance of the application to third party to as well contribute.

In addition, the application is also suggested to have more interactivity by providing more plug-ins and animation to make it more interactive and fun to use. The connection with other popular social media sites like Facebook, Twitter and Foursquare is also suggested so that users can update their where about and experience with people close to them.

For the time being, TourDroid is only focused on Perak due to the case study of Visit Perak Year 2012. It is expected to be replicated to other states in Malaysia having their own visit year. Technological advancement especially in mobile application should be taken into serious capitalization as it would be very useful and benefits a lot to both industry and users.

Perhaps, TourDroid can also be replicated into multiple Operating Systems (OS) like iOS and Symbian, just to name a few. The market potential of Smartphone is now huge and being able to leverage on its potential would surely benefited a lot to the industry.

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APPENDICES

Appendix 1: Pre-Implementation survey

Pre-implementation survey

Personal Information

1) What is your gender

Male female

2) What is your age group

20-25 25-30 30-35 35-40

3) Do you have any Smartphone?

Yes No

4) Do you subscribe for any 3G data connectivity or just when wifi is available?

Subscribe to 3G data plan only when wifi is available

Travelling preference information

5) Do you like to travel or go on a vacation?

Yes No

6) Do you prefer a low cost vacation/travel or a high cost?

Low cost high cost

7) Will domestic travel/vacation gives you satisfaction?

Yes No

8) Do you know that 2012 is a Visit Perak Year?

Yes No

9) Do you know that what are the 10 icons of Perak highlighted by Perak Tourism?

Yes No

Android application acceptance

10) If there is an android application which will guide you to those interesting places by providing a checklist of interesting activity to do, will you use it?

Yes No

11) Would you want GPS to locate your current location and direct you to the nearest tourist spot?

Yes No

TourDroid Application

TourDroid is an Android application to help tourists who came to Perak to optimize and savor the travelling experience by providing a checklist of cool stuff and activities to do at places offered in the application. Besides that, it also helps tourists to locate their current location and get direction from current location to the desired place. Please rate the questions below (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree)

- | | | | | | |
|--|---|---|---|---|---|
| 1. Mobile application helps me a lot in my everyday life. | 1 | 2 | 3 | 4 | 5 |
| 2. I am very familiar with mobile application and using it would be easy for me. | 1 | 2 | 3 | 4 | 5 |
| 3. The presence of mobile application would surely make my travel better and an enjoyable one. | 1 | 2 | 3 | 4 | 5 |
| 4. Internet is the first place I go to when I want to find any tourist spot to go. | 1 | 2 | 3 | 4 | 5 |
| 5. Integrating mobile application with internet such as Googlemaps will make the application to run slower and lag. | 1 | 2 | 3 | 4 | 5 |
| 6. By having a checklist of activities-to-do will make my travel / vacation more meaningful | 1 | 2 | 3 | 4 | 5 |
| 7. Most of the time when I go to a place of interest, I do not go what else to visit and what activity best to savor my travel experience. | 1 | 2 | 3 | 4 | 5 |
| 8. Vast/overload amount of information in tourism website tends to hinder quality information to be sought by tourists. | 1 | 2 | 3 | 4 | 5 |
| 9. Do you find using mobile apps on Smartphone is much easier than opening up a website in search for information? | 1 | 2 | 3 | 4 | 5 |

Appendix 2: Post-implementation Survey

TOURDROID: MOBILE TRAVEL ASSISTANT Prototype Testing

The purpose of this survey is to evaluate the effectiveness of the Mobile Learning Management System application in assisting two ways communication between parents and teachers and also as a monitoring tool for parents to monitor their children's academic performance.

Please rate (/) the questions below (1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree).

Please state your gender.

- Male
- Female

Please state your age.

- 30-40
- 41-50
- 50-60
- 61 and above.

1. The graphical user interface of this application is user friendly.

- 1
- 2
- 3
- 4
- 5

2. It is easy and simple to navigate through the whole application.

- 1
- 2
- 3
- 4
- 5

3. TourDroid helps people to identify 10 iconic places in Perak easily..

- 1
- 2
- 3
- 4
- 5

4. I found that TourDroid application is an interactive application that makes tourism more exciting..

- 1
- 2
- 3
- 4
- 5

5. TourDroid is very useful in providing information about interesting place in Perak..
- 1 2 3 4 5
6. TourDroid is able to ease the way tourist travel by the integration of GoogleMaps..
- 1 2 3 4 5
7. TourDroid helps me a lot in suggesting activities to do at iconic places by providing a checklist that I can check every time I finished an activity..
- 1 2 3 4 5
8. By using TourDroid, I don't have to worry about missing an activity at a destination of choice because TourDroid's checklist keeps me updated..
- 1 2 3 4 5
9. TourDroid is able to make me truly savor my visit to iconic places and redefining my travel experience.
- 1 2 3 4 5
10. Please give your suggestion for improvement:

- Thank You for Your Contributions -

TourDroid : Mobile Travel Assistant A Visit Perak Year 2012 Case Study

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Abstract-Tourism has always been the most profitable sector in Malaysia's economy (Tourism, 2010). However, the possibility is limitless and a lot of improvisations should be looked further to reap more value from this sector. An empirical study is done to find a missing link between to use of information system (IS) in mobile technological advancement and tourism industry. Visit Perak Year 2012 has become the case study for this project where a lot of data has been compared and contrasted. Android Operating System (OS), on the other hand, has been chosen to become the backbone of prototype software architecture. The use of "checklist" is highlighted in this geo-tagging equipped mobile application which will certainly assist tourists or travelers while traveling. With reference to Technology Acceptance Model and using Rapid Application Development as primary method, this study provides a more solid reason to come up with a mobile application using Android OS. This research focused on top 10 icons of Perak which are Sungai Klah Hot Spring, Kuala Kangsar, Lumut and Pangkor Island, Ipoh, Zoo Taiping and Night Safari, Orang Utan Island, Perak's Herbal Garden, Gua Tempurung, Matang Mangrove Forest and last but not least, Royal Belum State Park. An Android mobile application has become the outcome for this project.

I. INTRODUCTION

Travelers these days demand for more travel-related applications which are claimed to come in handy while going for a vacation or holidays (Chong, 2010). Besides finding it a lot more useful and easy to use, tourists who own Smartphone are already familiar with the mobile application environment. While Perak Tourism needs a more aggressive approach in marketing the tourist spots in Perak, the notion of leveraging the mobile applications market is vital to keep the industry strong while providing better service to tourists. Overload information in websites had also caused potential tourists to have a difficulty in finding accurate and reliable information.

TourDroid is aimed to enable tourist redefine the traveling experience and help tourists to savour their moments on vacation by providing a checklist of must-do activities. These activities are suggested based on the author's cross referencing activities with multiple tourists best travel websites like TripAdvisor, virtualTourist, lonelyplanet and wikitravel, just naming a few. Some of the activities suggested also came from the author own experiences during site visits and interviews. The scope of study on this research is focused to get to know more into this lucrative industry and how to narrow the gap of opportunities between IS environment and tourism sector besides providing a better marketing collateral for Perak Tourism.

This research has found Android Operating System (OS) to be the best platform to develop the prototype. AppInventor software development kit is used in order to come up with a working mobile application. Android OS has surpassed iOS with 46.9% of whole Smartphone market leaving the latter with only 28.7% (Gartner, 2011). This project has taken two (2) whole semesters to be completed which includes background study, research, documentation and prototype development.

II. LITERATURE REVIEW

Tourism is defined as "*An activity essential, to the life of nations because of its direct effects on the social, cultural, educational and economic sectors of national societies and on their international relations*" (WTO, 1995). This sector is one of the main contributors of the national Gross Domestic Product (GDP). In 2010, Tourism sector alone accounted for almost MYR 57 Billion in receipts and attracted 24.6 million tourists from across the globe (Tourism, 2010). It is by far, the highest statistic for tourism in terms of tourists' hits and receipts for more than a decade. Tourism sector is a critical source in keeping the nation's economy running as foreign exchange keeps flooding into the country and filling up the deficit holes made by the nation's spending.

Behind a good place for a tourist attraction, there is an aggressive effort in positioning the market and promotion. Here comes the most important part behind the success of any favorite spot for tourists, the marketing strategy. A decade ago, companies and organizations have had the freedom to decide what should customer put as their wants and need as well as how they deliver it to their customers. The internet changed that. In recent years, the traditional marketing is gradually changing to a more advance level which requires less effort but more on techniques, expertise and skills which gives the customers more buying power. Traditional media such as television, newspaper, radio and magazines are one-way, static broadcasting technologies and are already obsolete.

Marketing strategy via mobile and internet is now so popular that made these traditional media faced a steep decline in 2009. The significance does no longer exist for this type of marketing strategy. This pandemic cannot be good for any marketing agency around the globe but to find the solutions to this quickly. Smartphone users, on the other

hand have increased day by day and these users are able to have accessed to the internet at the tip of their fingers. In 2009 alone, the penetration of Smartphone in the US increased 25% and 14% of mobile phone shipments were Smartphones (Sharma, C. 2009). It is expected that by the end of the year 2011, the sales of Smartphone is going to surpass desktop personal computers (Snol, L. 2010). Recent trend of mobile apps boom has made tourism agencies and even governing bodies thinking on how they can value add people on the go. Nowadays any countries have taken the advantage of social media boom and IT to make their tourism sector flourish.

Vancouver, has launched a mobile application in the form of interactive tourist guide with the integration of street navigation of Vancouver and Whistler (Chong, S. 2010). The mobile application has been replicated into popular operating systems which include Android and Apple iOS. Thousand of downloads have shown that this application is loved by users and high acceptance in terms of its usage and functionality (Tourism Vancouver, 2011). Apparently, Android Operating System (OS) market share has surged over 56% leaving the closest competitor, Apple Inc with its iOS at 33% (Blodget, H. 2011). This is a proof that Android is going to have a huge amount of user leaving all of their competitors behind. While Android is going to conquer the Smartphone market, it is seen as a smart move to use Android OS in developing mobile applications. The sales of its Smartphones already showing good trend when Android Smartphone sales ousted iOS (Apple) Smartphones by 56.1% to only 22.9%! (Gartner, 2012).

Android on the other hand has a handful group of developers developing applications for Google Play, a market where each and every application are uploaded and downloaded. Applications in Google Play now has reached 600,000 and counting which includes applications and games (Constine, J., 2012). At this Google Play, besides enabling end user to download cool applications and games, it also displays the comments, and details about the applications developers. The possibility of developing mobile application in Android environment is endless and since the developer's community is now growing extra fast, it is going to be more convenient and better sources of references.

III. METHODOLOGY

As the project's title suggest, the development of TourDroid will be discussed phase by phase in System Development Life Cycle (SDLC). This project is going to be developed using Rapid Application Development (RAD) as extensive pre-planning is not necessary and the software can be written much faster and makes it much easier to change in case there is any (Whitten, L., 2003). The figure below shows the RAD model to implement the SDLC.

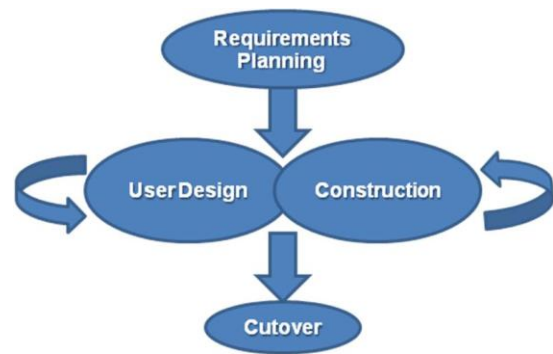


Figure 3.1: RAD model

For this project, RAD is the most suitable model to be used because it promotes a dynamic gathering of requirements and very strong collaborative atmosphere. The client who in this case Perak Tourism can be involved in prototyping as the development is going to cater their needs as well. The intervention from the client is very important as RAD may require the prototype to change from time to time. The phases included in this project will be planning, analysis, design and implementation.

The beginning of the project is focused on the theoretical readings and understanding of the project scope. The same goes with familiarization of the Android environment which includes the usage of the mobile application creator namely AppInventor and Illumination software. Several activities have been done in making sure this project a success. A lot of investment has been made to ensure the information provided in this application is reliable and will bring good impact to the users. Among the activities are :

- Survey and questionnaire
- Interview and discussion
- Literature review
- Site visit and data collection
- Designing application in Android development

The first phase is the project planning and feasibility study. This phase involved with a lot of research about tourism, marketing and Android development environment. Reviews from journals, research papers as well as internet sites were made as part of the research to strengthen the knowledge about the subject of this project and the research scope. For feasibility study, Perak Tourism, the main client or subject matter expert (SME) for the project, has been contacted and managed to talk to the CEO of Perak Tourism, Mr Fathil Ghani. A meeting and discussion has been made to get to know what is the main problem faced by the organization and ways they would conduct their advertisement and marketing in conjunction with Visit Perak Year 2012. The discussion has come to a conclusion that the top 10 icons of Perak has already been properly introduced or announced by Perak Tourism but the awareness of people in Perak is still at a very minimum level. A more aggressive approach should be ventured into and implemented.

After planning activities have been done and agreement has been achieved between the involved parties, several

analysis should be made in order to validate each planned activities and at the same time strengthening it. During the analysis phase, several steps are taken into consideration.

- Interview and surveys have been done and distributed to gather information about perceived expectation while travelling to potential tourists and travelers.
- The author analyzed current applications (mobile applications) related to tourism and see how does it work, and how does it affect the behavior and acceptance to users.
- The author went to almost all 10 icons of Perak and collect useful information to create a bucket of checklist of fun activities or a must-do at each icon.

The design phase requires the author to put what has been planned into graphical user interface (GUI), the conceptual, physical designs as well as the system architecture of the said application. The design is made from the result of data analysis. This is vital because the design has to be valid according to what users prefer and the nature of the scope.

Graphical User interface is the core of the application where as a tourism application; it has to capture the interest of the user to use it. Before programming starts, the logic and the positioning of the interface has to be able to facilitate the users relationship with the application. The design prototype in the form of GUI has to be produced on a paper-based design. The design on paper then shall be evaluated by the users. User’s responses and comments towards the state of the interface should be included in analysis to improve the application.

The conceptual design here is where the author creates logic of the application flow by using UML diagram which consisted of package diagram and flowcharts. Package diagram contains use cases to illustrate the functionality of the software system while the flowcharts shows logic of the application and to enable the author to track where the button click goes when initiated. In this conceptual design, the author uses Microsoft Visio 2007 to illustrate the functionality and to see working classes and component in the application.

The project is going to be developed by using author’s personal computer with the aid of chrome browser to enhance the usability of the software to create the application. To design the GUI, the author needs to use Adobe Photoshop and picture editing applications. On the other hand, for the development in Android development, an Android emulator is needed to test each screen upon completing it via installation of Android software development kit (SDK). The table below shows the specification of the project development.

Tools	Specifications
Hardware	A Samsung Galaxy Tab 10.1, Samsung Galaxy S2, Acer notebook

Software	Google Software, Adobe Photoshop, Chrome browser.	AppInventor Illumination SDK, Google

Table 3.1: Development Environment Specifications

The TourDroid is a standalone application with the integration of database. The database is used to store each selection the user has made and allow it to be retrieved back by the user anytime the user use the application. In this application using the AppInventor, tinyDB is used by the author. This is to ensure all the data is not lost when the user exited the program and re-launched it.

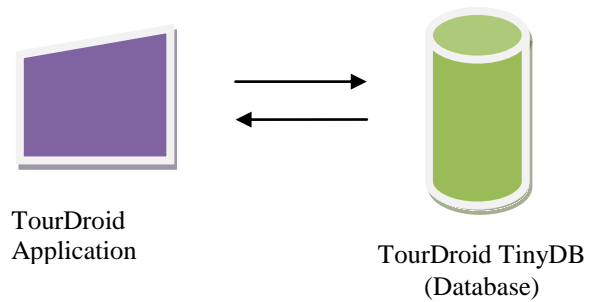


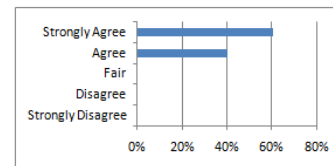
Figure 3.2: TourDroid system architecture

The final phase of the project development is the implementation phase where the author test and implement the completed application before it can be delivered to the intended users. The completed version is going to be the enhanced version of the prototype based on the feedback and comments from the identified audience and users. The feedback of the users is so important that every comment lead to the improvisation of the application which includes the aesthetic value and functionality issues. The major part of this phase brings a lot of technical works in working with codes of the AppInventor software.

IV. RESULTS AND DISCUSSION

A. Survey analysis

TourDroid is very useful in providing information about interesting place in Perak.



TourDroid is able to ease the way tourist travel by the integration of GoogleMaps.

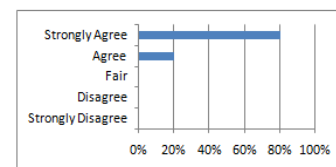


Figure 4.1: Testing result for perceived usefulness and ease of use of TourDroid

All of the respondents acknowledged the ease of use and usefulness of TourDroid during post implementation survey showing that the TourDroid has successfully meet its objective and acts as an aid to tourists while traveling.

B. Prototype

i. Interface

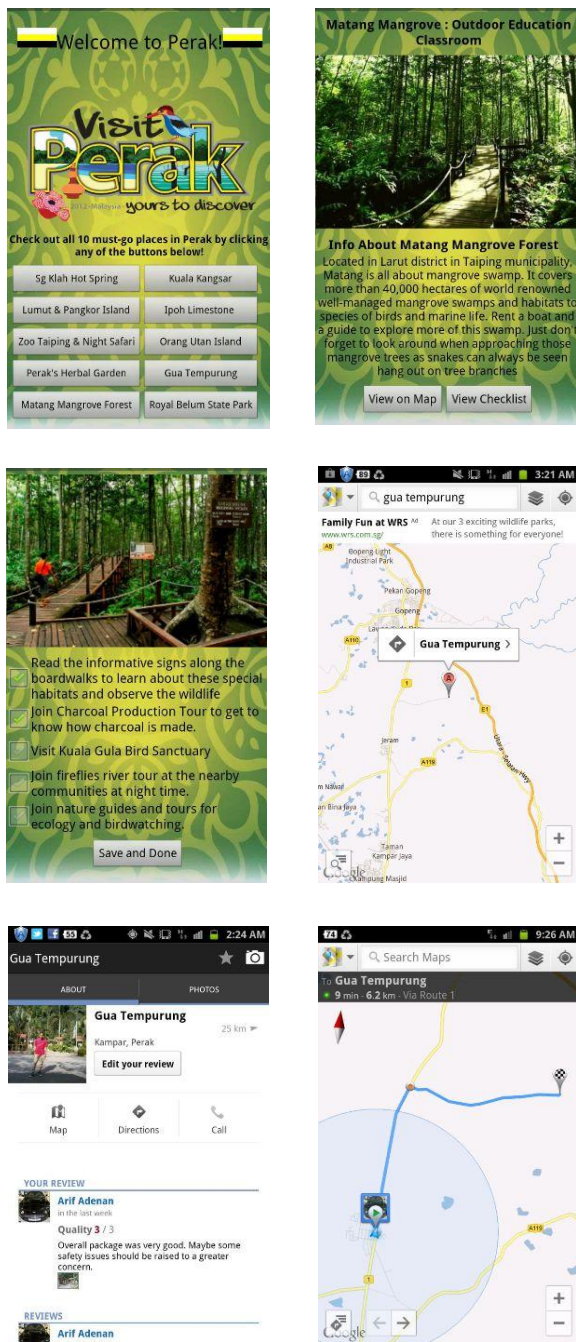


Figure 4.2: Interfaces from the application

ii. System flowchart



Figure 4.3: System flowchart

V. CONCLUSION AND RECOMMENDATION

In a nutshell, TourDroid is able to be functional and fulfill its objectives as discussed in Chapter 1. The author has successfully conducted researches about mobile application market, its potential and the correlation with tourism industry. The best technology platform has also been successfully identified and better understanding has been established by series of interviews and surveys. Analysis and design phase of the system has also been completed. The UML diagram, use case and flowchart had been designed to gain a clearer view on how the application works and should work. The application undergone few cycles of prototyping before the author is able to come out with a finalized prototype. During the testing phase several users have present and willing to give comments towards the betterment and improvement of the project.

This application has been taken to the field to test its effectiveness and it has helped the author at 4 different icons of Perak. TourDroid has helped in getting to the place and provide activities to be done so that the travel would become more meaningful. The fact that TourDroid provide checklist for the users to keep track their activities, tremendously helped tourists to come up with a virtual travel logs at different places. Therefore, the application is expected to increase the efficiency of the traditional traveling experience.

The first recommendation for this application is to make the information in the application is able to be modified in real time or in other word, to make this application relies totally on web. This would benefit a lot to let tourists be updated with changes happening in the state. It also helped the developer to outsource the maintenance of the application to third party to as well contribute.

In addition, the application is also suggested to have more interactivity by providing more plug-ins and animation to make it more interactive and fun to use. The connection with other popular social media sites like Facebook, Twitter and Foursquare is also suggested so that users can update their where about and experience with people close to them.

For the time being, TourDroid is only focused on Perak due to the case study of Visit Perak Year 2012. It is expected to be replicated to other states in Malaysia having their own visit year. Technological advancement especially in mobile application should be taken into serious capitalization as it would be very useful and benefits a lot to both industry and users. Perhaps, TourDroid can also be replicated into multiple Operating Systems (OS) like iOS and Symbian, just to name a few. The market potential of Smartphone is now huge and being able to leverage on its potential would surely benefited a lot to the industry.

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