ANDROID BASED MOBILE APPLICATION FOR HIKING IN SABAH, MALAYSIA: SabaHike

by:

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

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CERTIFICATION OF APPROVAL

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15967

A project dissertation submitted to the
Information System Program
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In partial fulfilment of the requirement for the
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Approved by,

_____

(ASSOC PROF DR MOHD FADZIL HASSAN)
Project Supervisor

UNIVERSITI TEKNOLOGI PETRONAS
TRONOH, PERAK

September 2015

CERTIFICATION OF ORIGINALITY

This was to certify that I am responsible for the work submitted in this project, that the original work was 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.

_____

(QAWIEM SHAFIQ BIN SHAHRIR)

ABSTRACT

Tourism is defined as individual or group travelling and staying in places outside of one's usual environment not for more than one consecutive year for leisure. Over the past few decades, tourism has grown and emerged with various diversifications to become one of the fastest growing economic sectors in the world. These days, the business volume of tourism may even outrank big industries such as oil exports, automobile or food products. Thus, tourism has become one of the primary players in the international commerce and being the sources of income for many developing countries. Consequently, with global spread tourism has produced economic and employment benefits through chained sectors such as construction to telecommunications. As such, there are many branches of tourism available that varies from medical tourism to space tourism that is available as of today, although this research would focus on mountain tourism in Malaysia. Unfortunately, there is no mobile application currently available to offer services to these outdoor enthusiasts to expand their hiking experience with correct information available just at the tip of their fingers. The objective of this research is therefore to fill the gap mentioned earlier by implementing a mobile application based on hiking for Sabah, Malaysia. Additionally it also provides a platform for companies to promote their hiking products and brand. The scope would focus on internal and external tourists involve in extreme tourism activities in Malaysia. The research method used will cover the qualitative method by posting surveys via the target groups in social medias. Eventually, a mobile application that have all the information for hiking activities in Malaysia would be delivered as a proof of concept.

ACKNOWLEDGEMENT

First and foremost, All praises to Allah the Ar-Razzaaq (The Provider) and Al-'Aleem (The All-Knowing) for constantly bestow His divine blessing upon us, until that of I could have completed my Final Year Project Report and may His peace and blessings be upon His messenger, upon his family, companions and whoever follows him.

I would also like to express my profound gratitude to Universiti Teknologi PETRONAS for accepting me as a student in their well-known & world leading energy company that redefines the future. Furthermore, my appreciation would also give credit to the Faculty of Science and Information Technology (FSIT) department from UTP for managing the student's final year projects efficiently.

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Last but not least, to my parents and brother who would always encourage me to perform better on tasks given. Their prayers, blessing and financial aid provided to me is vital for the progress upon completion. With that, I hope that one day I would be a son whom they would be the coolness in their eyes and would make them proud.

Yours truly,
Qawiem Shafiq

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CHAPTER 1

1.0 Introduction

1.1 Background of Study

Hiking is defined as a walk for a long distance especially cross-country activity. It is classified under the outdoor recreation and activities that is a leisure pursuit-taking place in the outdoors especially on a natural setting out of the urban area. Hiking is a goal directed outdoor activities that predominately involve the physical, mental, emotional and spiritual rewarding. It will definitely test the need for achievement through stamina, endurance and survival skills.

Malaysia support for mountain tourism was part of the 10th Malaysian Plan and Tourism National Key Economic Area (NKEA). The Tourism Transforming Plan aims to attract high yield tourist market and contribute significantly to the country's GDP. The Plan will chart Malaysia's tourism progress with the goal of welcoming RM36 Million foreign tourists and bringing in foreign revenue of RM168 billion by the year 2020.

This is also in line with Malaysian Youth and Sports Ministry's program of FitMalaysia that aims to facilitate the adoption of healthy lifestyle amongst Malaysian. It is also a part of the ministry aspiration to make Malaysia a sporting nation. It would also promote Malaysia to be a destination for sports tourism for global tourist to choose Malaysia as their preferred location.

A vast majority of European and America countries nowadays had established mobile application regarding tourism locations and places to visit in their own countries to promote tourist to visit their countries. Tourism could be in many different segments such as for sports, health, religious and other causes that would result in a boost of economy growth through visitors and their spending in a particular country.

The current trends of smart phone owners are increasingly into a very large number. Over five billion mobile subscribers, which would result about 77% of the entire globe population, are to be online (The International Telecommunication Union, 2011). The latest types of simple access for consumers are catching on with a staggering amount of smartphone owners purchasing goods and services from their own phones.

Mobile applications in any given operating system would have definitely increases the capacity of the mobile phone to a multi task device and to use the device at its optimum capacity and available functions. There are three identified advantages of using mobile application for any reason especially business: speed, volume of information and advertising.

1.2 Problem Statement

Programmers and researchers are looking forward on developing mobile technology for today's industry usage. There are several problem statements to be focused on regarding the proposed research in order to address the current needs and gaps.

1. There is no mobile application regarding hiking destinations in Malaysia especially Sabah.
2. There is no portal providing the precise location for hiking and its trails.
3. No available information of contact person/authority for a specific hiking location.

Although Malaysia is famous for hiking destination in south East Asia region, to the best of our knowledge, there is only one mobile application that is associated to hiking. With more application, it gives a different experience to the users and will be helpful for them to use it as a reference source even without the Internet connectivity.

Secondly, there is no mobile application that provides hiking trail and information of the mountain in Sabah that will be useful for hikers to have background knowledge on the mountain and to be referred to when the direction of climbing is not clear.

Finally, there are no contact details of authority in a particular district or location to be referred in case of any unfortunate event to search for assistance. This would definitely be useful for hikers who are not from that location.

1.3 Objective

The main objective of the study is to research on the problem of providing relevant and critical information pertaining hiking activities in Malaysia and to develop a mobile application that consists of usable functionality to be handy for hikers.

1. Compile the relevant information on hiking destination and authority contact details in Sabah.
2. Study and analyze the requirements for developing Android based mobile application to address the needs of hikers to venture into selected hiking destination in Sabah.
3. Design and develop the mobile application incorporating objectives 1 and 2.
4. Validate and test the application developed in objective 3.

1.4 Scope of Study

The particular area of studies shall be focused on the mountains and the needs of mountain hikers in Malaysia. Research would be done to gather more information and requirement through trusted sources such as the officials, professional hikers and research related to hiking and its information. The project is concerned on developing an android mobile application to consolidate these sources of information into a single application that contains all of the gathered information. The scope of study would be on:

1. Problem faced by hikers in Malaysia due to unavailability of mountain hiking trails.
2. Study on the current available mobile application consisting of relevant platforms, functionalities and supporting technologies.
3. Develop an Android Mobile application on mountain hiking that could serve as a single source of information to accommodate the needs and requirements of mountain hikers.

1.5 Relevance of Project

The project relevancy is related to the current lack of mobile application for the following group of stakeholders.

Potential Customer

Therefore, the study will help potential customer/ consumer to buy products of outdoors activities from a specific brands or shops to be promoted on the mobile application.

Society

According to Osman, Tablib, Sanusi, Shiang-Yen, Alwi (2012), Malaysia is one of the nations riding the wave of telecom advancement. Cellular telephone use in Malaysia has increased the continually trend for further extension. It is recorded that 85% of Malaysians who owns cellular telephone are having smart phone and become one of the items that cannot live without. This trend cannot be denied and it is expected the usage of smartphone will grow. The study will provide the solution that is mobile-based which will be relevant to the society as most people start to own a smart phone.

Learning Purposes

Researcher believes that this study will directly or indirectly relevant to the objectives of all research institution. The introduction of the mobile application solution will affect the solution provided by other research works. Even though mobile application is from the IT sector, but it can be diversified to various fields such as engineering and business field.

Researcher

As the researcher is from information technology, the study is relevant to the researcher itself because the study is expected to produce a mobile application solution to solve the problem statement listed. Besides that, user is expected to gain some knowledge on hiking, the forest and the basics of survival skills.

1.6 Feasibility of the Project

Feasibility analysis is the most required part in every project or study. It defines and helps you to make a decision whether to develop or not the project that you are entitled to complete.

- Understanding tools, such as Android mobile application platform.
- Project's Research and knowledge is adequate.
- Finding and using the right development tools for the implementation.
- System can be developed based on current knowledge and experience of the author after 4 years of learning throughout UTP.
- Mobile application which promotes Malaysia as a outdoor sports tourism activity and the application would be done within the time given.
- Enhancements from available mobile application on the market regarding tourism in Malaysia.

Technical Feasibility

In technical terms, the mobile application could be developed by the author with his knowledge on programming and other skills to ensure the project is a success. In order to develop the application, the author will use HTML, JavaScript and CSS development tools and the programming code and PhoneGap as the framework that can be referred through open sources.

Economic Feasibility

The economic feasibility assessment is that the application would be free for anyone to download for maximizing the potential tourists to visit Malaysia for mountain tourism. The checklists provided by the application could also be used as a promotion tool for certain brands of products to be purchased prior to hiking.

The android-based mobile phone will only cost about MYR 500 for the development of the mobile application. The cost for development of mobile application is excluded, as it is a requirement for the author to fulfill the FYP.

Time Feasibility

As for any other project, this one particularly needs a high commitment on every process of progression. Since the project time frame is very short, the process of finding the correct and precise research and to transform it into a workable mobile application without going through a proper training is quite challenging.

The time allocated for this proposed project to be developed is within two studying semesters. The first semester will be focused on the planning, analysis, research and design phase. On the other hand, the second semester will be developing the prototype and usability testing.

CHAPTER 2

2.0 Literature Review

2.1 Hiking

Based on Oxford Dictionaries (2015), hiking is defined as a long walk or distance especially across country. Hiking also can be classified as an outdoors activity such as to walk in a natural environment often in forest, mountain and so on. There are numerous types of hiking namely:

Backpacking: Hike carrying one's belongings in a rucksack.
Hillwalking: Activity of walking through hilly county for pleasure
Day hiking: Vigorous walk in the natural environment, lasting less than one day.

Generally, there are a lot of places for hiking activities where people would hike at the mountain, hillside, forest and more. Referring to TheTrailMaster.com (2010) there are multiple types of hiking trails to be followed during hiking activities such as:

Access trail: Any trail that connects the main trail to a town, road, or another trail system.
Backcountry trail: A primitive trail (can be open to motorized or no motorized users) in an area where there are no maintained roads or permanent buildings.
Hiking trail: Moderate to long distance trail with the primary function of providing long-distance walking experiences of a mile or more (often much more).

However, there are some issues that are raised while hiking that is the hikers do not have information about the trail and contact person in case of emergency. There are critical need for these information and no mediums for them to refer to this information at the tip of their fingers and with a really bad Internet connectivity in the wild, this would be a tremendous challenge.

2.1.1 Overview of Mountain in Sabah, Malaysia

As indicated by Taher,Jamal & Sumarjan (2015) Malaysia is a standout amongst the most mainstream rising mountain tourism destinations as the district that has tallest top mount Kinabalu (4095 m) is located in Sabah. Situated in the Kinabalu National Park in Sabah, the mountain is a famous destination among locals and internationals. The eight-kilometer climb generally begins from Timpohon Gate, close near park central station (1,800). Hikers more often stay at Laban Rata (3,273 m) for a night before continuing the climb to the summit the next day. For more provocative alternative, hikers can likewise decide to descend Mount Kinabalu through Ferrata, a course outfitted with settled links, temples, steps and bridges (Malaysia Traveller, 2014).

Besides from Mount Kinabalu, other attractive tourist mountain destinations including Mount Trusmadi with (2,642 m) and Mount Tambuyukon (2,579 m). Unfortunately, all this information there is no available mobile-based application at this point of time to feature these mountains.

2.1.2 Mountain Tourism

Pomfret (2011) classify mountain tourism, mountain trekking, mountain trekking and ice and rock climbing as a contingency tourism, regardless of its geological form. This challenging activity tackles a selection of sights and routes, including ice, snow, glacises and even tropical downpour timberland. Mountaineering can be a subset of other tourism classifications: nature based tourism (Whitlock, Rorner & Becker, 1991), eco-tourism (Johnston & Edwards, 1994), and enterprise tourism (Carrol, 1999: Pomfret, 2006). Presently, mountaineering activities have developed all-inclusive, open door for industry players to produce imaginative bundles and motivated promoting systems for an unlimited development in income.

A survey of literatures reveal that there is an absence of generally acknowledged term used for mountain climbers who recreationally scale or climb up mountains with the particular objective of reaching to the summit (Lasco, 2009). Then again, a man who performs an open-air activity that comprises frequent trekking of trails is termed a climber (Heer, Rusterholz &Baur, 2003). In a few nations, the mountain dweller is additionally a term utilized by climbers to portray the sorts and scenes of the mountains (Pomfret, 2006), along these lines recommending contrasts in phrasing that are inescapable crosswise over societies and nations

2.2 Mobile Application

Referring to (Holzer & Ondrus, 2010) Mobile computing has caught the attention of the research community for quite some time and has also reached the commercial industry and mainstream consumers via smartphones and PDAs. The combination of mobile devices, third generation wireless services with multimedia capabilities, Internet and portable technology, this allow data and information to be received “anywhere”, “anytime”, and by: anyone”. As the ability to retrieve data increase so will the need to retrieve data. Lately, the development of mobile applications has generated more interest among the independent and freelance developer community. This has opened up new avenues for future mobile application and service development. The potential of the mobile application market is expected to reach $9 billion by 2011, according to Compass Intelligence.

As of today, this has changed with the landing of programming organizations with new cell telephones and stages, for example, the iPhone and Android. The business sector structure and quality chain are developing (de Reuver and Haaker, 2009; Feijóo et al., 2008). This makes the process of retrieving new information as a form of knowledge capture to keep up with the nature of fast and rapid changes due to advancements and progress of updates through mobile connectivity to increase learning opportunity.

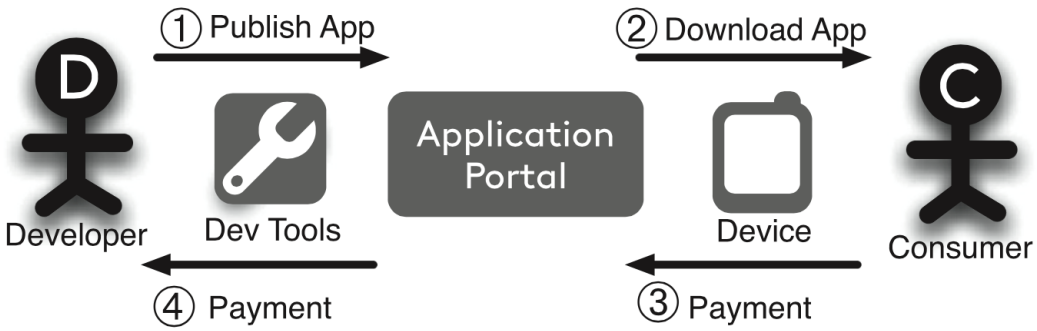


Fig. 1. Mobile application distribution process. Cited from (Holzer and Ondrus,2011)

2.3 Operating System on Mobile Devices

The current versatile advancement business sector is commanded by five major stage suppliers (i.e., suppliers of working frameworks and improvement apparatuses) to be specific: Nokia with its Symbian OS (52.4%), 2 RIM with its Blackberry OS (16.6%), Microsoft with its Windows CE OS family (11.8%), Apple with its iPhone OS (8.2%), and LiMo Foundation with its Linux Mobile working framework (8.1%). Furthermore, Google propelled its Android working framework and is now anticipated that would get to be a piece of the enormous players quickly in the business. Gartner predicts that it will turn into the second most prevalent stage behind Nokia by 2013 (Cozza, 2009).

To structure the depiction of the current practices, we propose to analyze the current portable application advancement component from a research viewpoint. From a research view point the methodology could be classified into the following of the smart phones operating system based on the following categories:

2.3.1 Android

Android is an operating system intended for utilization in some PDAs and other devices. This innovation, which is claimed by Google, Inc., incorporates a working framework, programming, and applications. The working framework is derived Linux. Android innovation is kept up and persistently grown by the Android Open Source Project (AOSP).

Google obtained Android Inc., a 22-month-old Palo Alto, California, a start-up in July 2005. Android Inc. was helped to establish by Andy Rubin, producer of cell phone Danger Inc. The buy was key in Google's turn into the remote innovation market. In 2008, Google presented the HTC Dream as the initially showcased telephone to utilize Android innovation. Since that time, this stage utilization has extended to other advanced cells; tablet PCs, netbooks, and different gadgets.

2.3.2 IOS

In what is generally viewed as his most prominent presentation ever, Apple's Steve Jobs acquainted the iPhone with the world on January tenth, 2007. In the five or more years from that point forward, the iPhone, iPad, and iPod Touch have actually reclassified the whole universe of versatile figuring. That world is moving so rapidly that iOS is now amongst the more seasoned versatile working frameworks in dynamic improvement today. That absolutely doesn't mean it’s underpowered or under featured a remarkable opposite. Through what must be depicted as persistent and steady change throughout the years, Apple has made iOS a standout amongst the most highlight rich and decently bolstered stages available.

iOS 8, the biggest release for developers since the introduction of the App Store the latest framework at present controlling Apple's cell phones, offers a. It offers new APIs to enable even more amazing features and bold new technologies for game development the App Store makes all of these applications easy to access, easy to search and easy to buy using the same account you use for iTunes. Just browse the App Store on your iOS device and download them with a tap. Maybe the most striking thing about iOS is the way comparative the OS as it exists today is to the OS as it existed 2007, yet the number and broadness of highlights that Apple has prepared in from that point forward is psyche boggling. A long way from misery from the "highlight crawl" that commonly stalls working frameworks after some time, iOS has figured out how to stay moderately smart and is more inside reliable than whatever else accessible today.

2.3.3 Android vs. IOS

According to the data and report from International Data Corporation (IDC, 2015) Worldwide Quarterly Mobile Phone Tracker. Holiday seasonality, strong end-user demand, and a deep selection of models propelled smartphone volumes to a new record level for the quarter and for the year. The worldwide smartphone market grew 28.2% year over year in the fourth quarter of 2014 (2014Q4), with shipments of 377.5 million units. Android still dominates the market with a 76.6% share in 4Q14. Apple managed to ship 74.5 million units this quarter with a year-over-year growth of 46.0%, closing the gap to a near tie with Samsung. For the full year, the worldwide smartphone market shipped a total of 1.3 billion units. This is a 27.7% growth from the 1.0 billion units of shipments in 2013.

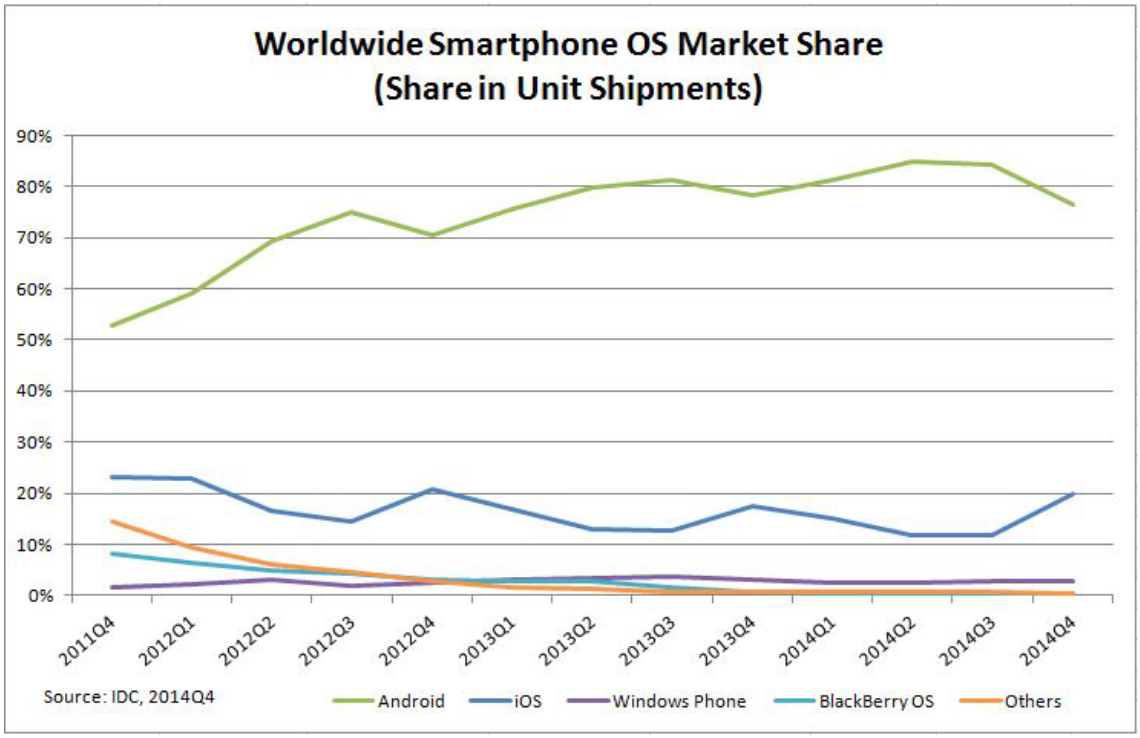


Fig. 2. Worldwide Smartphone OS market Share. Cited from (IDC, 2014)

Period	Android	iOS	Windows Phone	BlackBerry OS	Others
Q4 2014	76.6%	19.7%	2.8%	0.4%	0.5%
Q4 2013	78.2%	17.5%	3.0%	0.6%	0.8%
Q4 2012	70.4%	20.9%	2.6%	3.2%	2.9%
Q4 2011	52.8%	23.0%	1.5%	8.1%	14.6%

Fig. 3 Worldwide Smartphone OS market Share by year statistics. Cited from (IDC, 2014)

Android pushed past the one billion-unit mark in 2014, a significant milestone by itself but also because total Android volumes in 2014 bested total smartphone volumes in 2013. Samsung retained the leadership position by a wide margin, shipping more volume than the next five vendors combined. At the same time, Samsung's total volumes for the year remained essentially flat while Asian vendors including Huawei, Lenovo (including Motorola), LG Electronics, Xiaomi, and ZTE fueled the most growth for Google's platform.

According to Malaysian Communications and Multimedia Commision (MCMC, 2012) A large number of respondents could not name the mobile operating system that their smartphone were on. Smartphones do not always use a particular OS and either is an OS associated exclusively with a particular make. In the light of this, it was not possible to determine through the survey, the relative popularity of mobile OSes. That notwithstanding, shipment numbers from IDC indicate that in 2012, the leading OS in Malaysia market in the Android (79.0%) followed by iOS (10.7%) and Blackberry OS (4.1%).

Based on the research that have been made, it is better to develop hiking in Malaysia mobile application on an Android based mobile phones to optimize a global marketing possibility and to be downloaded in majority of the mobile phone users in the world.

2.4 Need to Have Mobile Application for Hiking In Malaysia

Currently there is a recent trend of practicing a healthy lifestyle in the society of Malaysia especially the youngsters; they started to have outdoor recreational activities with their family and friends to some location nearby that is ought to be on a nature environment. This current trend is the background reason and importance of he application and research made.

The current issue available is on:

- Mobile application has been so popular these days that almost all functionality is being implemented and available into a mobile application.
- People need an instant application need to explain on knowledge or self-learning application for their activities.
- Application on hiking activities is not being fully utilized.
- Several hiking mobile application available outside Malaysia.
- Importance to promote hiking activities and locations in Malaysia with the feature available to have sharing features to social media

2.5 Current Technologies in the Market

To the best of the researcher's knowledge, there is only a hiking mobile application in Malaysia will be emphasize and examined for this project because of the lack availability of such applications. The application mentioned is called ***Malaysia X Hikers***. The application will be available in the Google Play which will be freely to download. The screenshots of the application from Google Play is as of below:

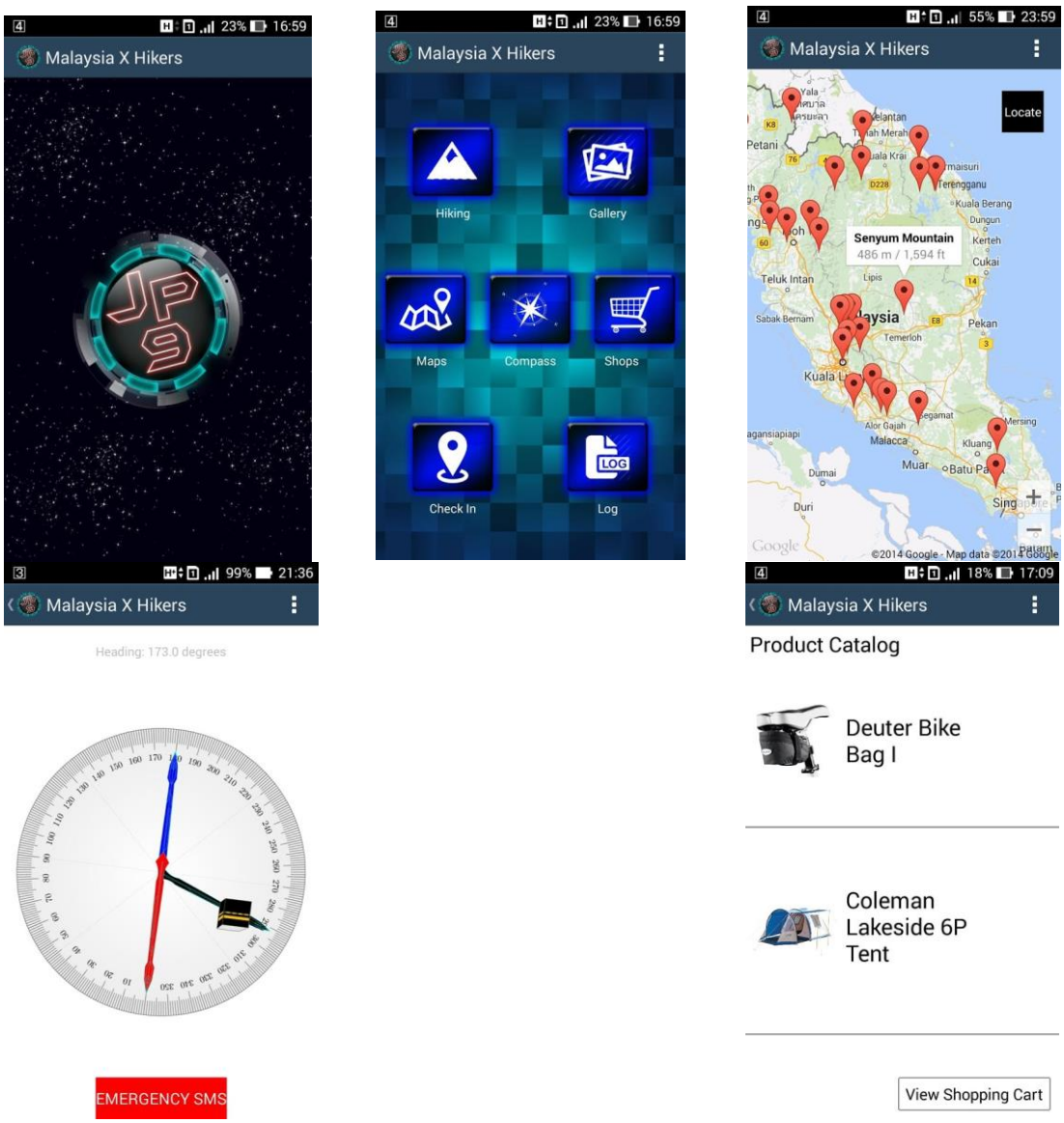


Fig. 4. Malaysia X Hikers Mobile Application Screenshots

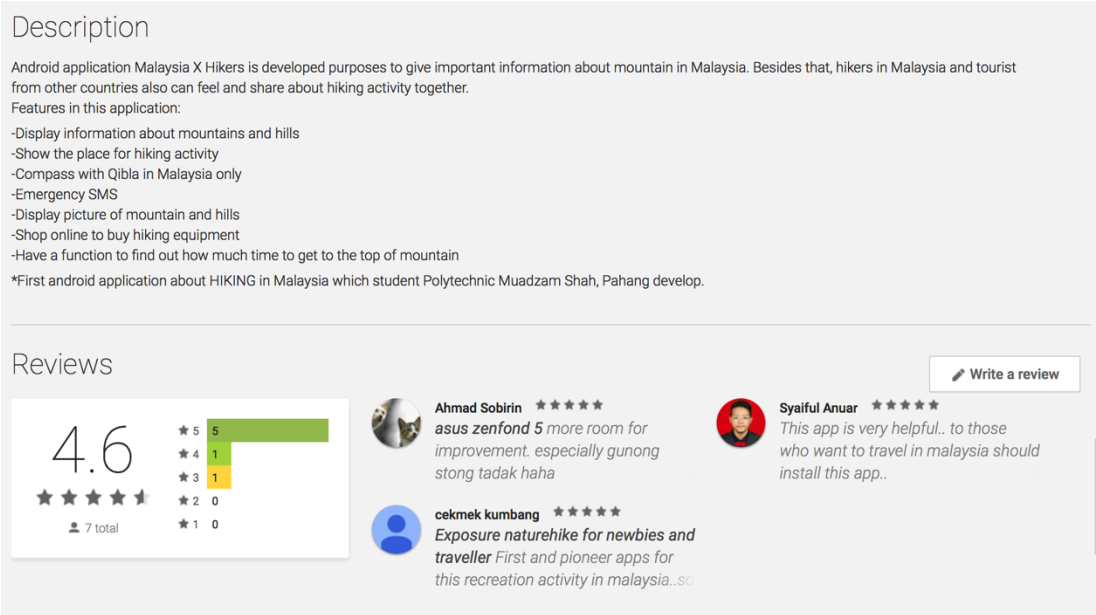


Fig. 5. Malaysia X Hikers Description and Review on Google Play

Other details of the mobile application are:

Offered by: JP9 Crew

Last Updated: 4th October 2014

Size: 50M

Installs: 100-500

Current Version: 1.2

Requires Android: 4.1 and above

Content Rating: Low Maturity

CHAPTER 3

3.0 Methodology

3.1 Research methodology

Research methodology is the process to collect information and data for the purpose of making decisions. There are ample amount of research methodology available to develop hiking mobile application in Malaysia. Several research methodologies have been carried out to sort the work plan by following the research procedures, strategies and conducting several approaches to the required knowledge.

Quantitative method and data retrieval is used to measuring variables and verifying existing theories or hypotheses or questioning them. Data is generated new hypotheses based on the results of data collected about different variables. Most individual are better convinced about the ability through numbers and statistics shown.

Questionnaires are being structured and approved before being promoted to social media and other medium. In order to collect the required data the survey was conducted with Survey Monkey, as an online survey development cloud based company for data analysis. For sample survey questions, refer to the appendix at the end section of this report.

3.2 Development methodology

Rapid Application Development (RAD) is used as the development methodology for this project. It is a general term used to refer to alternatives to the conventional waterfall model of software development. Generally, RAD approaches to software development put less emphasis on planning tasks and more emphasis on development.

In contrast to the waterfall model, which emphasizes very precise and rigorous specification and planning, RAD approaches emphasize the necessity of adjusting requirements in reaction to knowledge gained as the project progresses. This causes RAD to use prototypes in addition to or even sometimes in place of design specifications.

RAD approaches also emphasize a flexible process that can adapt as the project evolves rather than rigorously defining specifications and plans correctly from the start. RAD is especially well suited although not limited to developing software that is driven by user interface requirements.

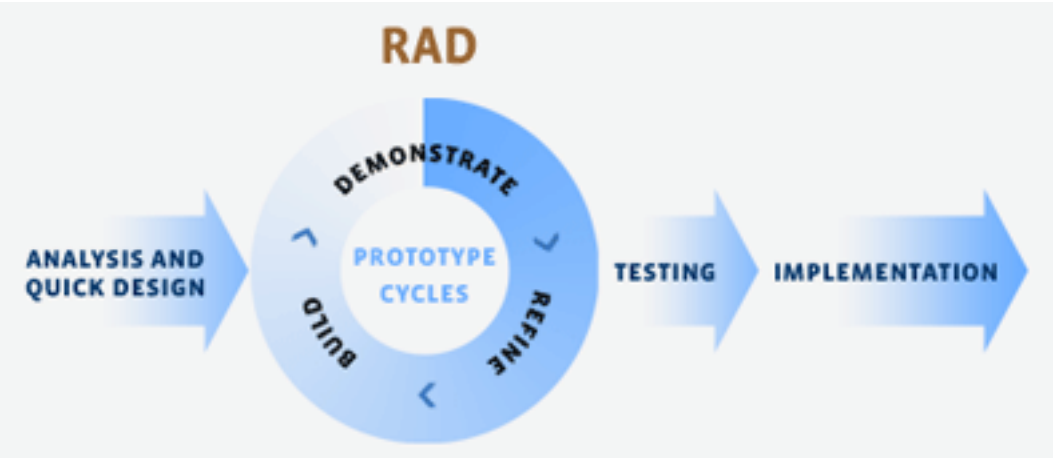


Fig. 6. Rapid Application Development (RAD) diagram.

Analysis

In this initial state, the researcher carried a research on the available hiking related mobile applications. The main outcome for this stage is to compare previous works by other researchers, which are related to the topic. Additionally, in this stage, researcher attempted to enhance the research with customized functionality and gather relevant information via research papers and other related sources.

Design

The design stage is focus on how the system will look in the end of the project. For this stage, the researcher prepared the application framework, the diagrams (Activity Diagram, Use Case Diagram) and Application interfaces as the deliverables.

Prototype Cycle

This stage is to develop a prototype to have a finished view of the design. The prototype is demonstrated to the supervisor and some target users for feedbacks and ideas for changes and improvements. It was also be demonstrated to few hikers here in Malaysia for responses and comments. From the comments and feedbacks, the prototype will be refined based on them. It will be improvise to meet the best criteria and functionality.

Testing

Testing phase is to test the developed prototype of the application. A usability test or user acceptance test was carried out with the target users. This determined whether the application fulfill the functionality mentioned. This method will help in determining problems of the application and to fix any mistake done.

Implementation

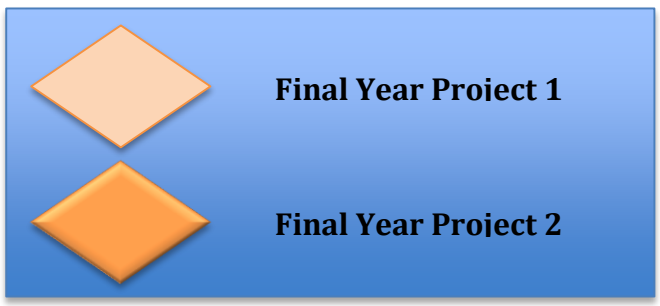
Finally, this stage implements the actual construction and installation of the application. This stage requires the application to be developed from development status to production status. Subsequently, the application is installed and the application is in the actual production. It covers the maintenance of the application and any further updates in the future.

When the mobile application was successfully built, user acceptance testing was performed. This testing would give the developer the confidence that the application produced meets the user requirements. Thus, a user acceptance testing result and a summary assessment are required at the end of the process.

3.6 Key Milestones

No.	Deliverables /Activities	Schedule (week)
1.	Title Selection & Proposal	**2**
2.	Project Approval	**3**
3.	Submission of Draft Interim Report	**11**
4.	Interim Report Submission	**12**
5.	Proposal Defence	**13**
6.	Pre-SEDEX	**10**
7.	VIVA	**13**
8.	Submission of Project	**14**

Legend:



3.7 Gantt Chart

Activities / Week	Final Year Project 1														Final Year Project 2													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Planning																												
Discussion with SV																												
Selection of project topic																												
Identify the problem																												
Define objectives of project																												
Study on project background																												
Preliminary research work																												
Literature review																												
Design and Development																												
Draft the system flow																												
Design system component																												
Prototype development																												
Design user interface																												
Coding mobile application																												
Testing																												
Unit test																												
Integration test																												
System test																												
Acceptance test																												
Improvement of prototype																												
Implementation																												
System Implementation																												
Maintenance																												
Important Dates																												
Submission of interim report																												
Proposal defense																												
Pre-SEDEX																												
Viva																												
Project submission																												

CHAPTER 4

4.0 Result and Findings

4.1 Compilation of Information Features for the Application

The application can be categorized into 4 main functions as listed below:

1. List of Sabah's Mountains
2. Authority contact details
3. To buy/prepare list
4. Compass with Qibla direction

Addition functionalities for this application are:

1. Travel Tips
2. Survival Tips

4.1.1 Hiking Destination

The Information needed about the mountain are retrieved through new Kinabalu Park booklet that has all the trails and details. The official website for the board is http://www.sabahtourism.com.

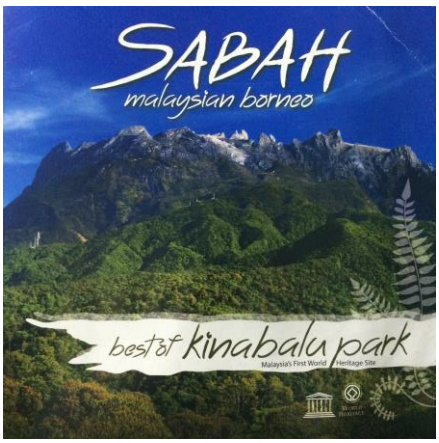


Fig. 8. Cover Page of latest Kinabalu Park Pamphlet

Mount Kinabalu

Mount Kinabalu (4095 m or 13,436 ft) is well known as the highest point in South East Asia between the Himalayas and the mountains of New Guinea; it is famous for the sheer majesty and grandeur of its granite peaks and its immense biodiversity.

Elevation: 13,435 feet (4,095 meters)
Location: Crocker Range, Sabah, Borneo, Malaysia
Status: World Heritage Site; protected under Sabah Parks
Prominence: 13,435 feet (4,095 meters) 20th Most Prominent Mountain in the World
Coordinates: 6.083° N / 116.55° E
First Ascent: First ascent in 1858 by H. Low and S. St. John

Mount Tambuyukon

Mt Tambuyukon (2,579m) huddles elusively at the northern part of the Crocker Range, the backbone of Sabah. Set within the 754 sq. km boundary of Kinabalu Park, the mountain is protected by Sabah Parks Board, the park authority that manages Sabah's national parks, nature and wildlife conservation areas.
Southwest to Tambuyukon, looms Mt Kinabalu's granite massif.

Elevation: 2579 meters (8462 feet); third highest mountain in Sabah and Malaysia
Location: Kinabalu Park (Ranau & Kota Belud districts)
Status: World Heritage Site; protected under Sabah Parks
Coordinates: 6.2086° N / 116.6581° E
Highlights: Summit flora of Nephentes, Orchids and Rhododendrons
Base: Park sub-station at Kg. Monggis
Duration of Expedition: 4days and 3nights

4.1.2 Emergency Contact

Sources of authority contact details are extracted through Yellow Pages E-Directory 2015 from page 319 – 330. Relavant details of official authority contact details including hospitals, police station and fire and rescue department.

Fig. 9. Front Page for YellowPages Sabah Edition

4.2 Requirement Gathering & Analysis

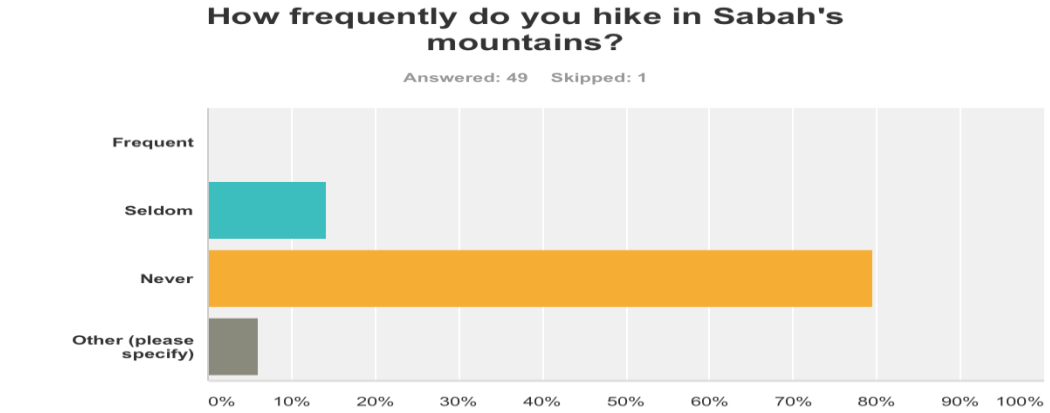
The requirement needed to develop this application is benchmarked with a mobile application named Malaysian X-Hikers. Other functionalities are discussed with few people who are experienced in hiking and willing to share their opinions.

An analysis is made through questionnaires posted to a hiking community in social media to study what is relevant in this project and what to add or amend.

4.2.1 Online Survey

For this part of the project, the researcher has sent questionnaire survey to gather data from potential users on Facebook.

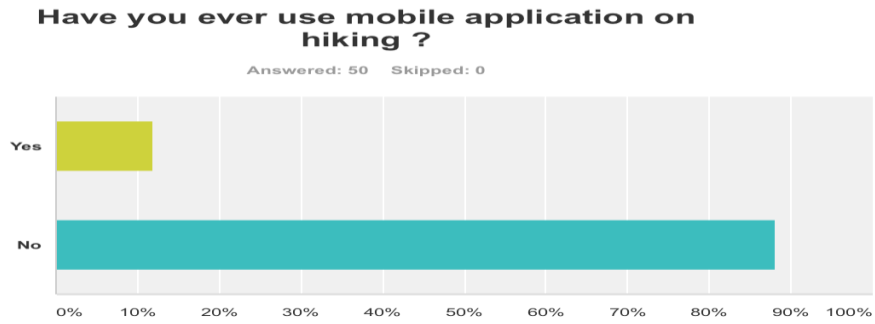
In the questionnaire survey, 50 people have responded. There are questions are 9 to be answered by the respondents with 6 questions are related directed to the research and 3 questions are about demographic information of respondents. The result of the demographic questions could be summarized with 46% are female and 54% male with 75% of them are from the age 21-29. This is followed by the age group of 30-39 (12.24%). Most of them reside in Malaysia (94%) followed by the Philippines. The survey result related to the research is listed as below:



Answer Choices		Responses	
Frequent		0.00%	0
Seldom		14.29%	7
Never		79.59%	39
Other (please specify)	Responses	6.12%	3
Total			49

Fig. 8. Evaluation of frequency on hiking in Sabah's mountains

The figure above shows that the frequency of people who hike in Sabah's mountains. Result shown that a huge majority of them (i.e. 79.59%) never did any hiking activities in Sabah. This is followed by (14.29%), seldom frequency by and others 6.12% (annually and once). There are a large number of people who have never been to Sabah and this application would be a good source of information for them to refer.



Answer Choices	Responses	
Yes	12.00%	6
No	88.00%	44
Total		50

Showing 4 responses

montein haikeng apps
3/28/2015 1:49 AM View respondent's answers

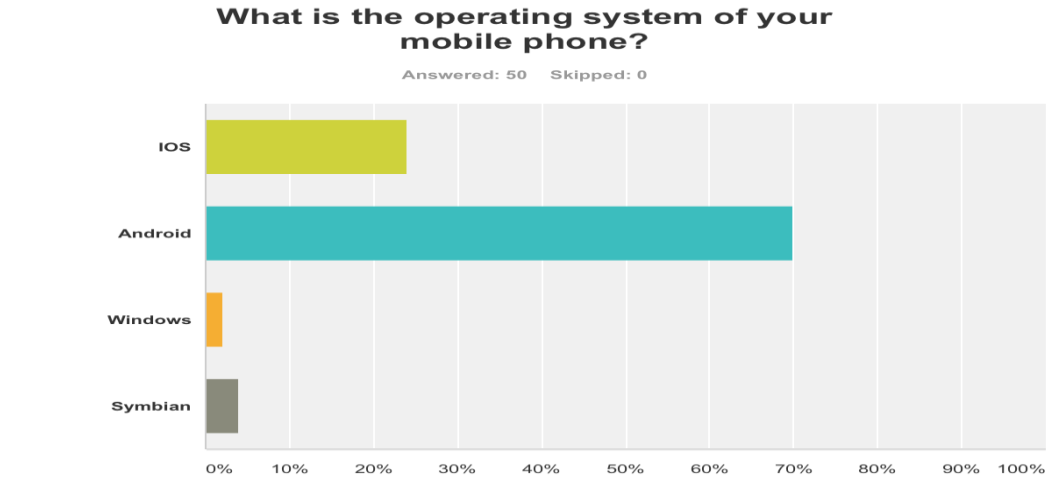
view ranger
3/28/2015 12:50 AM View respondent's answers

Hike & Run
3/27/2015 10:52 PM View respondent's answers

Everytrail , map can't load properly
3/27/2015 9:26 PM View respondent's answers

Fig. 9. Evaluation of response on the usage of hiking mobile application

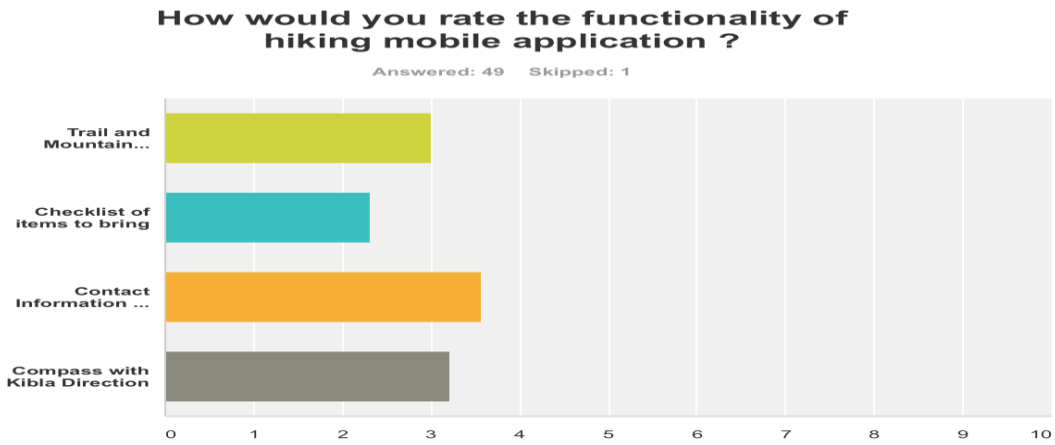
The next question is regarding of the usage of other mobile application for hiking. A large pool of people answered no with 88% and the other 12% of people have at least used ever used hiking mobile application which they referred as montein haikeng apps, view ranger, Hike & Run and Everytrail. The application mentioned above should be a reference for case study and for improvising of this project.



Answer Choices	Responses	
IOS	24.00%	12
Android	70.00%	35
Windows	2.00%	1
Symbian	4.00%	2
Total		50

Fig. 10. Evaluation for the operating system of mobile phone

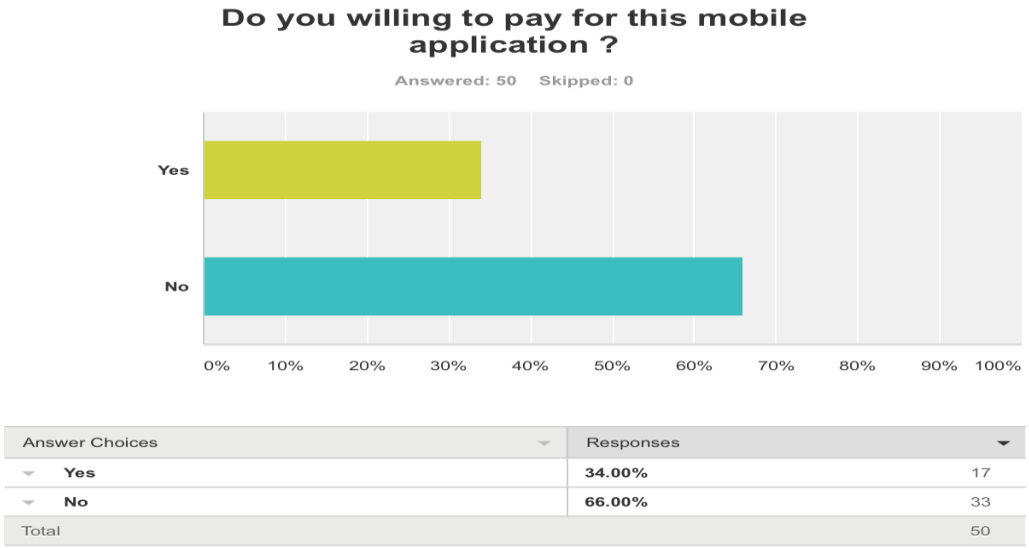
This particular question is about the operating system used in the smart phone of the population surveyed. Android have the majority of 70%, followed by iOS with 24%, Windows by 2% and Symbian with 4%. The result above will be a strong reason to choose Android-based mobile phone to implement this mobile application for maximizing potential promotion market.



	Not Important	Important	Very Important	Total	Weighted Average
Trail and Mountain Information	8.33% 4	33.33% 16	58.33% 28	48	3.00
Checklist of items to bring	12.50% 6	43.75% 21	43.75% 21	48	2.31
Contact Information of authorities in case of emergency	4.17% 2	25.00% 12	70.83% 34	48	3.58
Compass with Kibla Direction	6.12% 3	30.61% 15	63.27% 31	49	3.22

Fig. 11. Evaluation of functionality of SabaHike hiking mobile application

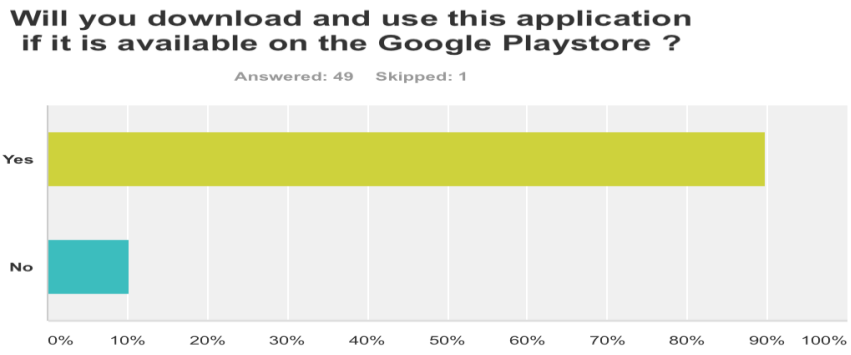
This question is for the people to rate the functionality of the hiking mobile application. There are 4 functionalities; the most important function rated by the people is the contact information of authorities in case of emergency by 70.83% rated very important with a weighted average of 3.58. Followed by, compass with Qibla direction with 63.27% rated very important with a weighted average of 3.22. Then, trail and mountain information 58.33% rated very important with a weighted average of 3 and lastly, the checklist of items to bring with 43.75% rated very important with a weighted average of 2.31. The rated functionality should be done with priority and emphasize on the quality of each.



Answer Choices	Responses	
Yes	34.00%	17
No	66.00%	33
Total		50

Fig. 12. Evaluation of willingness to pay for the developed mobile application

This question is to ask the willingness of potential users to pay for this mobile application. A huge majority of people answered no by 66%. The rest (ie. 34%) will be wiling to pay if this mobile application could be complete. Result shown that this could be better if the application is made for free so many people would download the application although it could also be charged but with a small fee.



Answer Choices	Responses	
Yes	89.80%	44
No	10.20%	5
Total		49

Fig. 13. Evaluation of download and usage of application if available on Google Playstore

The final question of the survey is about the rating of people who would download and use this mobile application if it is available on Google Playstore. 89.80% of population answered yes and with 10.20% people answered no. Potential marketable mobile application is there for people to download.

4.2.2 Benchmark with Malaysian X Hikers

Functionalities	X-Trail	SabaHike
Trail Map	X	Y
Authority contact	X	Y
Information about mountain	Y	Y
Qibla Direction	Y	Y
Checklist of important items	X	Y
Travel tips	X	Y
Online Shop	Y	X

The benchmarking against X-Trail is that some important functionality is not available. They are no trail map, authority contact details, checklist of what to do to prepare before the expedition and travel tips that are particularly very important. SabaHike is customized to address these needs. Trail map is needed in case user wants to use it to navigate through the expedition, authority contact is not provided that are location specified, checklist of important item is not really customized for such expeditions and travel tips for foreign tourist to refer when travelling in Malaysia.

4.3 Development

Software

- **PhoneGap**

PhoneGap is an application container technology that allows you to create natively installed applications for mobile devices using HTML, CSS, and JavaScript. The PhoneGap API handles communication with the native operating system. PhoneGap provides an application programming interface (API) that enables you to access native operating system functionality using JavaScript. However the final product of a PhoneGap application is a binary application archive that can be distributed through standard application ecosystems.

These are the same application packaging formats used by "native" applications, and can be distributed through the appropriate ecosystems (iTunes Store, Android Market, Amazon Market, BlackBerry App World, Windows Phone Marketplace). The core engine for PhoneGap is 100% open source

Operating Systems	Output
iOS	IPA file (iOS Application Archive)
Android	APK file (Android Package),
Windows	XAP file (Application Package),

4.4 Validate & Testing

The purpose of User Acceptance Test is to ensure that the new systems, mobile applications or process does actually meet the essential user requirement, User Acceptance Test will involve target users for evaluating SabaHike mobile application. The main features that are being tested for the target user's are captured through the following questions:

- How do you rate the functionality of the mobile application in terms of performance?
- How do you rate the graphical user interface design of this mobile application?
- How do you rate the mobile application in terms of user friendliness?
- How do you rate the operational performance of this mobile application?
- Do you understand the concept of the mobile application?
- Is there consistency in the theme used on this mobile application?

Targeted users are from UTP hiking club that is Kelab Kembara UTP. After the testing, users are required to fill in the questionnaire as shown below.

User Acceptance Test Form

Title : Android Mobile Based Mobile Application for Hiking in Sabah, Malaysia: SabaHike

Developer : Qawiem Shafiq Bin Shahrir

Student ID : 15967

Programme : Business Information System

In the scale 1-5, Please tick the best option for the following questions. (5=Excellent, 4=Very Good, 3=Average, 2=Poor, 1=Very Poor)

No.	Question	Very Poor	Poor	Average	Good	Excellent
1	How do you rate the functionality of the mobile application in terms of performance?				/	
2	How do you rate the graphical user interface design of this mobile application?					/
3	How do you rate the mobile application in terms of user friendliness?					/
4	How do you rate the operational performance of this mobile application?				/	
5	Do you understand the concept of the mobile application?					/
6	Is there consistency in the theme used on this mobile application?					/

Please write any comment (if any):

Functionality testing:

The purpose of the system testing is to check the fulfillment of functionalities based on the requirement. Table below shows the data of each functions of SabaHike.

System Functional Testing for mobile application

Functions	Expected Outcome	Testing Frequency	Testing Result		Remark
			Success	Failure	
Welcome Note	Slight introduction of Sabah	5	5	0	
Home	Navigate to the Functionalities	5	5	0	
Mountains	Navigate to the list of mountains and information with its trail.	5	4	1	
Contact	Details on the specific location authority contact	5	5	0	
Checklist	List of items to bring for the expedition	5	5	0	
Compass	Qibla Direction for hikers	5	3	2	
Travel Tips	Basic details a tourist needs to know.	5	5	0	
Survival Tips	Survival tips video extracted from YouTube	5	5	0	

4.5 Design

4.5.1 System Architecture Design

System architecture is a conceptual model description and representation to define the structure view of a system. It compromise of a few elements regarding to this research to develop a mobile application regarding hiking that will work together to implement the overall system.

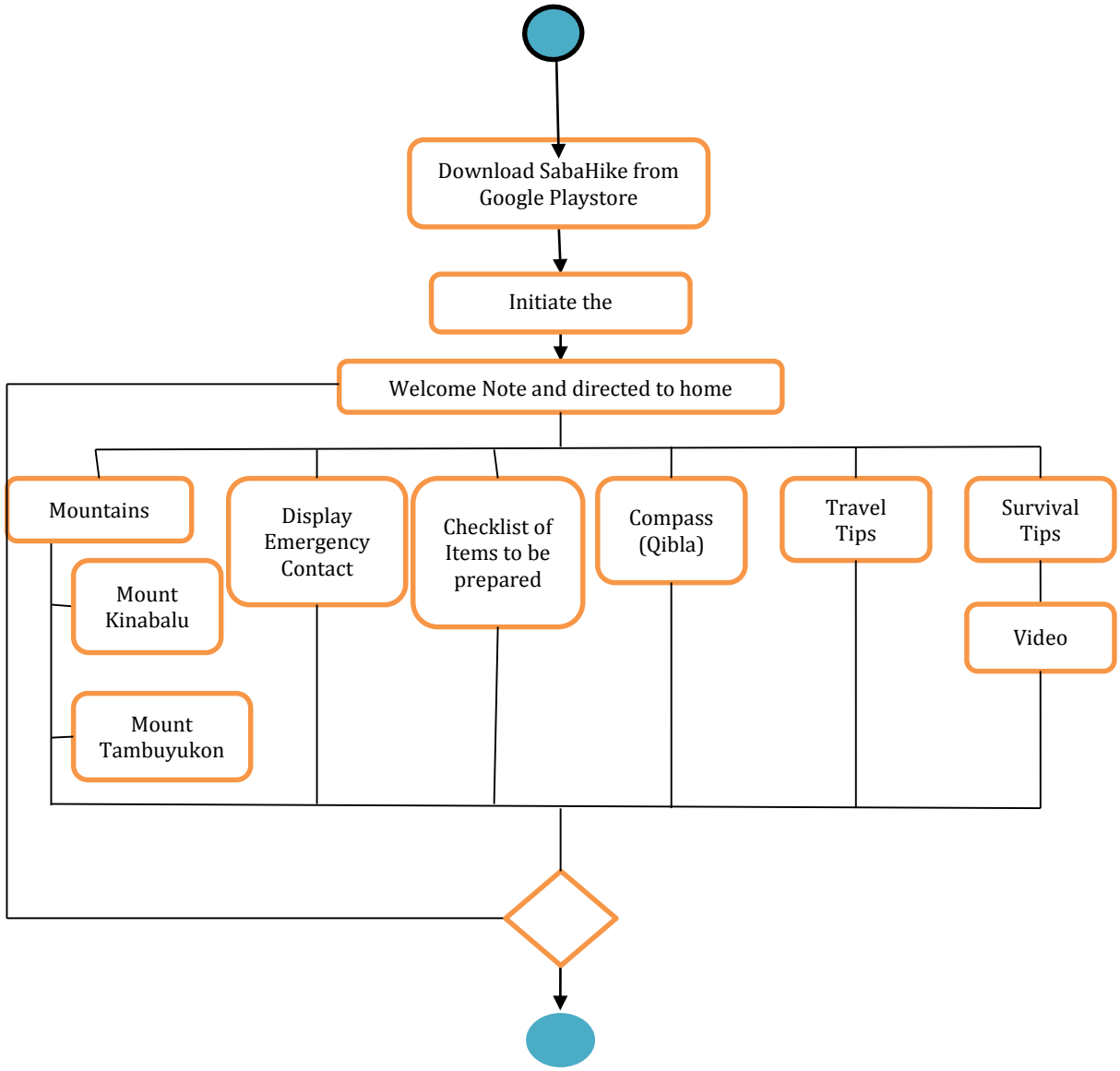
Fig. 7. System Architecture Design for SabaHike.

This application will be using software design architecture pattern of model-view- controller. View in this app context will be the interface that connects the users with the application. The administrator is the one that managed this application.

The system architecture of this mobile application will be developed using HTML, CSS, JavaScript and PhoneGap is used as the application framework. The Android-based application will be used by the user while for the administrator to manage and maintain the information would be utilized android mobile application developer software and tools.

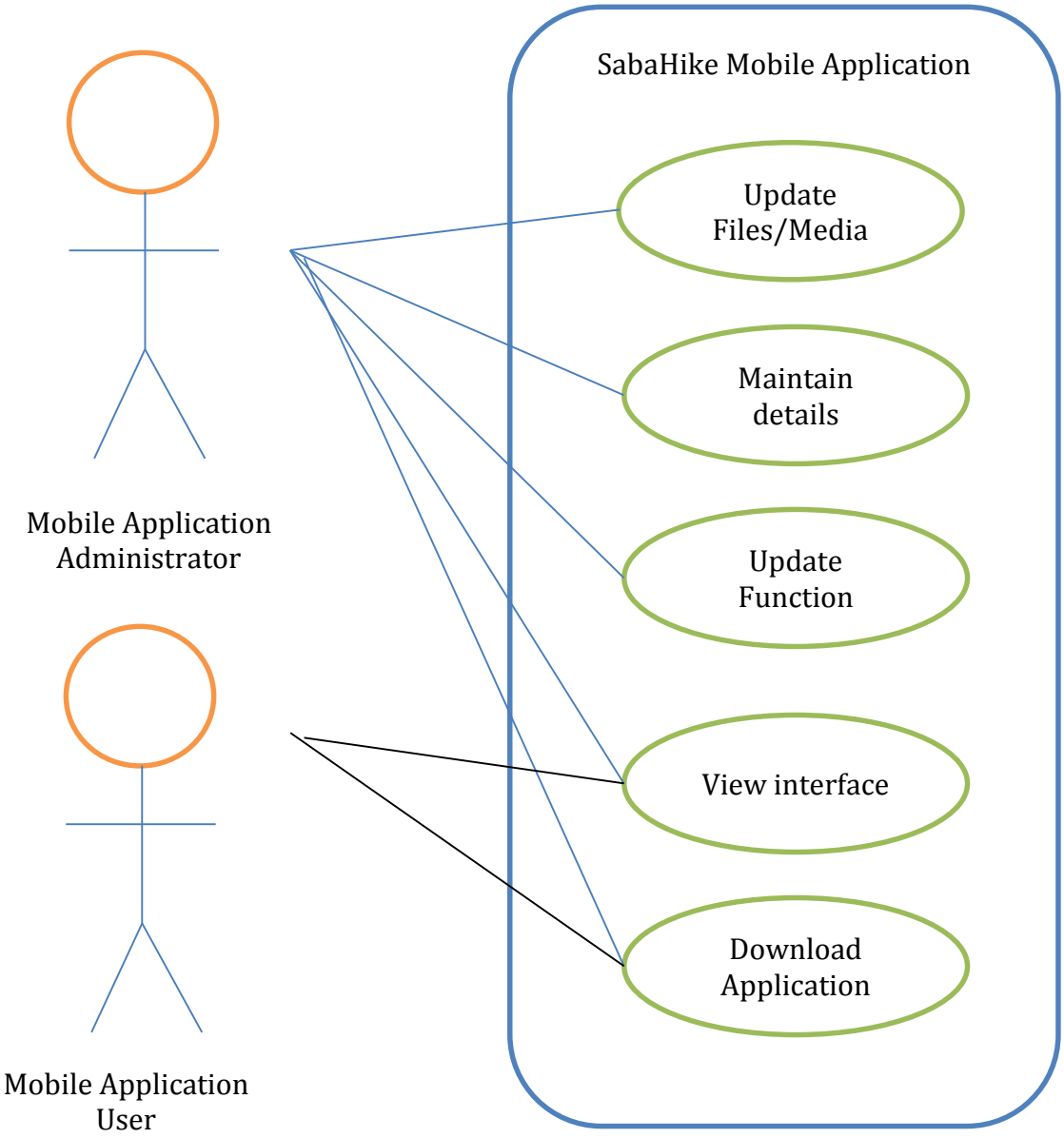
To use SabaHike, users must first download the application in the Google Play store. Appropriate software and tools will be used for the development or improvement and editing of the application before it is being uploaded to the Google Play store.

4.5.2 Activity Diagram



Activity Diagram shows the flow of this mobile application. First and foremost an Android-based mobile phone system is needed to download this application from Google PlayStore. The initiation of the application starts with a welcome note. Then the home landing page will be featured with the main functionalities of the application requirement. After that, the user could click on any functionality that is mountains, emergency contacts, checklist, compass, travel tips and survival tips. Users could always be directed to the home of this application through the home button or end it.

4.5.3 Use Case Diagram



Use case Diagram shows the function and actor for the system. This system will have two actors, which are the mobile application administrator and mobile application user. In this system also have five functions that are update files/media, maintain details, update function, view interface and download application. The administrator would have access through all the functions while for the users only to download the application and view the interface.

4.5.4 Interphase Design

Fig. 14. Welcome screen for SabaHike mobile application and the functionalities.

The figure above shows the welcome screen that contains the title and user will click 'Enter' to start using the application. Once the 'Enter' button is clicked, the home landing page will be featured on the screen. It consists of a few options as follows, mountain, contact, checklist, compass, travel tips and survival tips.

Fig. 15. The functionality of Mountains tab

The first functionality is when the user click on the first tab which is the list of mountains in Sabah. With that, the users would see the list of mountains available in Sabah. Click on the tab for further information of the mountain.

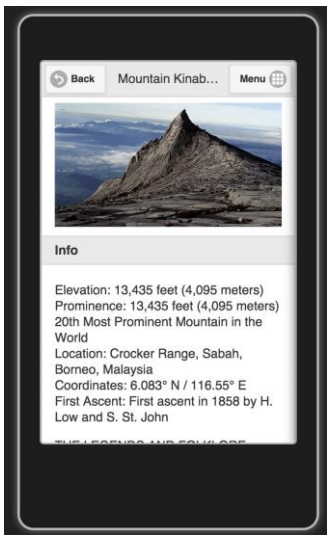


Fig. 16. Details of mountains in Sabah

Later, with the selection of mountain information that the user intends to know, it will be directed in the new screen that will have the details of the mountain with tracking trails and background of the mountain.

Fig. 17. Contact details of authority

The second function would be the authority contact details, once the tab is selected, it would show a list of division in Sabah and it will magnifies the contact details to a location level in case of any emergency. This will make it much easier especially for those who are not from Sabah to contact the authority if any unfortunate events tend to occur.

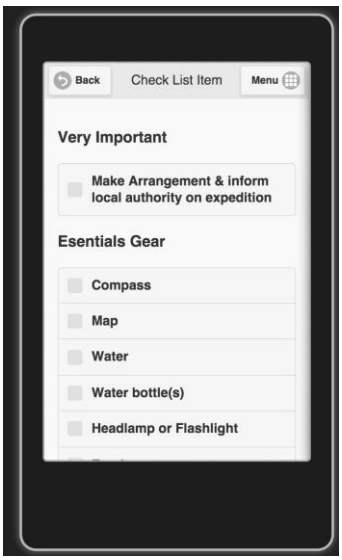


Fig. 18. To do/prepare checklist

The third function would be the list to buy or prepared before going for hiking expedition. It will show what items are necessary to have with to bring and check box to list what is needed to bring.

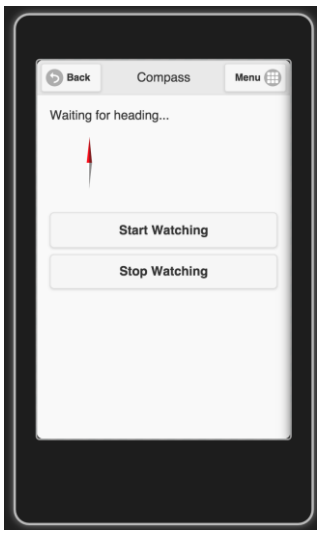


Fig. 19. Compass functionality

The forth function is that the users are able to use compass for direction purposes provided a simple introduction and how to use the function and it is equipped with Qibbla direction for praying purpose of Muslims hikers in the wilderness.

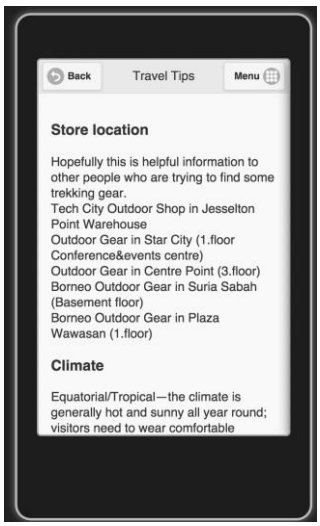


Fig. 19. Travel tips

Fifth function is to share some travel tips with the user of the application about general information regarding travelling in Malaysia and some stores that do sells trekking gear on stores in Kota Kinabalu.

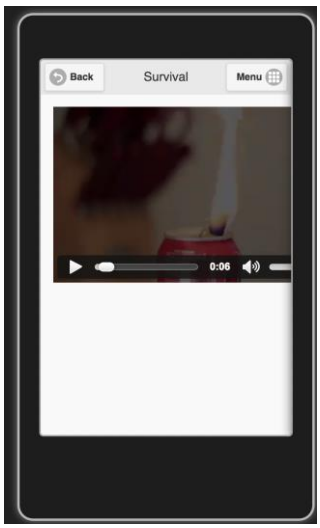


Fig. 19. Travel tips

Finally, the last function is to about the survival tips using common household item, the video where the video is extracted from YouTube. Tips demonstrate in the video are lighting a candle for better performance, filtering water, keeping the charcoal burning, use basil to keep the mosquito away, solar charge grill sandwich, natural way of making a compass and emergency oil lamp.

CHAPTER 5

5.0 Conclusion and Recommendations

5.1 Conclusion

This project focuses on exposing information regarding hiking and mountains of Sabah with the usage of mobile application as a platform to be used by potential visitors of the state and to promote mountain tourism. Introduction of such technologies will definitely help the tourists to be more resourceful with the right information channeled to them. By adapting this technology with such information will be use widely in tourism methodology to attract more visitors using an android-based mobile application.

This project serves as an initial platform for technologies to be incorporated into tourism and to promote the right form of information that hikers need. In the future, it is hope such project in this field can be developed and expanded using this project as its focal point because the making of an android mobile application definitely has a big potential for future project expansion especially in making an application that useful to the internal and external society.

For business aspect of the project, it would help in promoting brands and products and simply an application that people could find information at their fingertip even without the connection of the Internet. Methodology discussed was used in gathering all data and information needed to ensure the success of this project. Research has been done in studying the effectiveness of this application and shows a good respond on showing how mobile application technology in promotion.

In conclusion, through the survey sent out to the society, the application would be a beneficial use for the society. The research meets the main objectives of the research.

5.2 Recommendations

This research will be a stepping-stone for future mobile development in the making of tourism based mobile application to be at handy. However, there is several concerns to be taken into account and to be improved in certain aspect for future development of work.

This prototype have several limitations have been encountered as the components of the AppInventor 2 is lacking of some technology and lack of certain function due to limited application size and it would be better if the researcher is provided with the technologies to develop mobile application and possibly a very proper class or tutorial on making mobile application.

Future modification that can be done to the project is to add more functionality and usability to it so that the application will be up to date and cope up with the current evolving technologies.

Moreover, other media such as animation and video can also be added in this application to make it more lively and attractive. These modifications can help the application to improve to be commercialized and used as a medium of promoting. More interactive functions on the application should be added in the future so it will be more attractive and user friendly to create interest and ease of use.

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APPENDICES

QUESTIONNAIRES

Mobile Application for Hiking In Sabah,Malaysia

Assalamualaikum and a very good day to YOU !

This survey is conducted for my final year project deliverable. This project and research is done to promote Sabah, Malaysia as a extreme outdoor activity tourism (hiking) with proper information and details regarding hiking location and checklist preparation and others for every outdoor enthusiast to plan on their hiking expedition.

I would personally would like you to spend some of of your time to fill this survey.

Your cooperation and attention in this matter is truly appreciated.

Thank you ! Have a nice day...

1. Your gender?

- ◯ Female
- ◯ Male

2. What is your age?

- ◯ 17 or younger
- ◯ 18-20
- ◯ 21-29
- ◯ 30-39
- ◯ 40-49
- ◯ 50-59
- ◯ 60 or older

3. In what country do you currently reside?

- ○ Malaysia
- ○ Indonesia
- ○ Brunei
- ○ Thailand
- ○ The Philippines
- ○ Other (please specify)

4. How frequently do you hike in Sabah's mountains?

- ○ Frequent
- ○ Seldom
- ○ Never
- ○ Other (please specify)

5. Have you ever use mobile application on hiking ?

- ○ Yes
- ○ No

If yes please state the name and feedback of application...

6. What is the operating system of your mobile phone?

- ○ IOS
- ○ Android
- ○ Windows
- ○ Symbian

Others (please state)

7. How would you rate the functionality of hiking mobile application ?

	Not Important	Important	Very Important
Trail and Mountain Information	○	○	○
Checklist of items to bring	○	○	○
Contact Information of authorities in case of emergency	○	○	○
Compass with Kibla Direction	○	○	○

8. Do you willing to pay for this mobile application ?

- ○ Yes
- ○ No

8. Do you willing to pay for this mobile application ?

- Yes
- No

9. Will you download and use this application if it is available on the Google Playstore ?

- Yes
- No

Thank you for answering this survey !

Powered by **SurveyMonkey**
Check out our sample surveys and create your own now!