Chapter I

INTRODUCTION

1.1 Statement of the Problem

Sultan Kudarat is located in southwestern part of the island of Mindanao it is bounded on the north by its sister provinces, It was once a part of the former empire province of Cotabato. By the virtue of Presidential Decree No. 314 last November 22, 1972, signed by the former President Ferdinand E. Marcos. It was created as a separate province along with Maguindanao and North Cotabato. The word "Sultan Kudarat" was derived from a Muslim ruler, the late Sultan Mohammed Dipatuan Kudarat who begun to assert his leadership in the year 1619.

The province of Sultan Kudarat has a total land area of 513,530 hectares or roughly 5,135.30 square kilometers. This province is consists of eleven municipalities and one city, namely: Bagumbayan, Columbio, Esperanza, Isulan, Kalamansig, Lambayong, Lebak, Lutayan, Palimbang, Pres. Quirino, Sen. Ninoy Aquino and Tacurong City and with a total of 254 barangays.

According to Catherine D. Trinidad OIC-Provincial Tourism Service Executive Assistant III, there are 12 main tourist spots in Sultan Kudarat, these are the two major mountain ranges, Alip Range in Columbio and the Daguma Range located in the municipality of Bagumbayan, Isulan and Esperanza. Sultan Kudarat has a good atmosphere for the tourist because they could find a gift of nature like Pangadilan Water Falls in Columbio, Palm Oil in Isulan, Banana

Plantation in Lambayong, Rajahbuayan Convention Center in Lutayan, the Bird Sanctuary in Tacurong, Lagbasan Cave in Senior Ninoy Aquino, Bambad Falls in Bagumbayan, Hot and Cold Spring in Esperanza, Tuna Bay of Palimbang, Mangrooves in Lebak and Balut Island in Kalamansig.

Tourism industry isfast growing in a developing places like Sultan Kudarat. However, in Sultan Kudarat, Touristguide agencies, which will take change of guiding, exploring, introduce the wonders and historic places within the province.

The absence of a tour guide has a big impact to every tourist industry in terms of guiding them in the places, introducing the historic area which can keep them astound to those cultural and natural heritage of the land. So, most of the tourist encountered problems such as lack of idea or information about the places in Sultan Kudarat, locating a high-end hotels and lodging houses, fine dining restaurants or even fast food chains, fare rate for public transportation and also time spent in travel.

Therefore, proponents decided to create a mobile application that gives a information about the province of Sultan Kudarat such as history and the locations of the tourist spots, and will design an application that will minimize the time of finding the direction of the tourist spots in the province of Sultan Kudarat.

1.2 Current State of the Technology

According to the Tourism Office, if there are tourists who wanted to explore the province, they will send first a letter of communication for the approval of the Tourism office who will confirm the letter. Once it is approved, the Tourism office will give an instrument like maps to guide a group of tourists since there are no tourist guides in the province. During their travel and adventure, tourists solely rely on the map given map to locate their destination, there are instances that they need to ask for assistance from the police outpost or ask some details of direction from the standers along the way, so that, they would not lost the track of the spot.

The study focused on creating an application for travelers and local people. It includes maps where you can search for places that depend on the consumer's current need. The application then shows a colored path that will guide you on your way to the place you have searched for. This system also has an activity log for the list of previous searched places and activities done in the application for an easier user experience.

A geographic information system is a computer system for capturing, storing, querying, analyzing and displaying geographically referenced data. The geographically referenced data describes both the location and characteristic of spatial feature. It is also known as the spatial data. Websites such as may quest, map blast do provide quick and simple maps. The users can enter location address

and points of interest get the desired information. For instance, data about nearby schools and churches. (Prasad, 2015)

The paper presents category classification of mobile travel applications accessible at the moment for tourists in application stores for most popular mobile operation systems (Android and iOS). The most interesting category is “Travel Guides” that combines “Information Resources” and “Location-Based Services” category. Authors propose application “Tourist assistant – TAIS” that is related to “Travel Guides” category and recommends the tourist attractions around. Information about attractions is extracted from different internet sources.(Alexander Smirnov, Alexander Smirnov 2012).

In this paper, an android based mobile application is presented to guide the tourists and daily commuters in their travel in Mumbai city. Tourists will be guided through mobile application it informs the tourist about nearby Bus Stop. All details of buses arriving and departing at that bus stop. The application is designed for Mumbai city where the bus (BEST) services are provided to the people for travelling different places in Mumbai. The Application gets the Current location of the user through GPS in the form of Longitude and Latitude and this information is send to the Sever. The server replies with the information which contains the nearby Bus Stand along with the Bus Details such as Bus no, Bus route, and Bus Source and Destination. Index.(PrashantBeldar, PrashantBansode 2014).

1.3 Objectives

1.3.1 General Objectives

The study aims to develop a Tourist Guide Mobile Application for the province of Sultan Kudarat.

1.3.2Specific Objectives

1. To create moduleswhich will display thefollowing:
    a. Real-time location of the user.
    b. General information like brief history and special occasions of Sultan Kudarat.
    c. Geographical map of Sultan Kudarat.
    d. Shortest path between the current locations to destination specified by the user.
    e. Approximate transportation fare for the selected path.
    f. Location of the tourist spots of Sultan Kudarat.
    g. Location of the nearby hotels and restaurants.
2. To create a module that perform the following:
    a. Search engine.
    b. Saving users track record.
    c. Shares visited places on social media.
3. To create a module that show following logs:
    a. Visited places.
    b. Bookmarked places.

1.3.3 Scope and Limitation

In developing the application, the proponents decided to use android studio as the official integrated development environment (IDE) for android platform development.

The application has a quick access button that will show the locations of the random areas such as banks, hotels, hospitals and etc., and it is built for android mobile users with the minimum requirements of 4.4(Kitkat) android version or with a higher android version 5.0(Lollipop).

The application has a splash screen that shows data loading progress. It views the geographical map of Sultan Kudarat and its specific places. Once the user clicks a certain place in the map, it will represent the user with information from the database.

The application can detect the real time location of the person through (GPS) Global Positioning System, so the user knows where they will go and it tells the user the shortest path way from their current location to their destination.

It also gives information such as the fare rate of the different mode of public transportation vehicles of Sultan Kudarat such as motorcycles, tricycles, multicabs, bus, vans and jeepneys.

It also allows the user to share most visited places in Social Media such as Facebook.

The study will be focused on creating an application for travelers and local people. It includes map where they can search for places

depending on the consumer's desire, it also shows a colored path that will guide their way to the place they want to go. The range of the application only covers the Sultan Kudarat area, it will run by the use of wifi or mobile data with a minimum requirement of at least 3G or much higher.

1.3.4 Definition of Terms

Android a operating system currently runs on most of mobile phones and currently developed by Google.

Integrated Development Environment (IDE)software application that provides comprehensive facilities to computer programmers for software development.

Globl Positioning System (GPS) a space-based navigation system that provides location and time information in all weather conditions, anywhere on or near the Earth where there is an unobstructed line of sight to four or more GPS satellites.

Mapping is graphical representation of a procedure, process, structure and features of a surface part.

Chapter II

THEORETICAL FRAMEWORK

2.1 Introduction

This chapter presents the different theories that support the project development of Tourist Guide App and provide the foundation for the particular materials on GPS applications. The Theory about locating different places intended support and guide in developing this project.

2.2 Theoretical Framework

2.2.1 Theory of Mobile Application

This project Android Tourist Guide provides the tourists with province map depending on its current location entered by the android phone user. This information helps the tourists to find the desired locations to visit. Well it consists of entire details of those locations or how to reach the location as well as other emergency amenities like hospitals, hotels, bus stops, and also search places of the tourists spot in Sultan Kudarat that's provide the basic information. This project is mainly beneficial for the tourist's having no idea about the places they want to visit. By providing geographic based information systems the tourists and people shifting to new places can get a better guidance of the places they want to visit. This proposed application require any internet access. By making the application GIS based, it includes many advantages as the user can view the required location in map and accordingly estimate the time that will be required to

reach the final destination. The system gives the basic details that will be required such as an image of that place along with basic details like the address, etc."Mobile tourism" represents a relatively new trend in the field of tourism and involves the use of mobile devices as electronic tourist guides. (M. Kenteries 2007).Today's tourists expect to get personalized access to tourism information at any time, from anywhere with any media. Mobile tourism guides provide the user with such a ubiquitous access. The prerequisite for this is the notion of customization, requiring awareness of the applications context together with appropriate adaptation mechanisms. Currently, there is a proliferation of mobile tourism guides, proposing an unmanageable number of diverse functionalities. (Context-Aware Recommendations in the Mobile Tourist Application COMPASS - Setten, Pokraev, et al. – 2004).

The proposed mobile application for tourist in Sultan Kudarat can searchable and viewable by geographical locations for easy to tourist finds the places or spots. Users used this application to guide their selves and this application view historic photos of a location as they stroll the different places in Sultan Kudarat and provides useful and valued information. The proposed mobile application will run on android operating system on mobile phones.

2.2.2 Theory of GPS

GPS has seen wide application in the construction industry for tracking resources. (Navon et al. 2003) indicated how personnel location could be collected automatically and translate into labor hours spent on a particular project. (Song et al. 2005) integrated RFID and GPS to locate materials on construction site and (MajrouhiSardroud 2010) proposed a framework based on RFID, GPS and GSM to transfer field data to site office. Some of the challenges GPS faces are that it cannot operate indoors or in built up areas where signal blockage could be experienced. GPS in the first place used an elaboration of e technique that is tried and used by navigators.

This mobile application, GPS works by providing information on exact locations of the tourist want to go. The purpose of this device is to allow a user to store maps and other information in a small portable device that also provides position information using a GPS receiver. When using this device, a user would typically obtain raster-format digitized maps which would be edited using companion software on a personal computer.

According to Hopkins (2013), A GPS device can help with mapping out routes to unfamiliar destinations. It can also come in handy when a driver is lost. Both businesses and consumers can take advantage of this navigation feature to not only make it to their destinations, but to also save on gas and time through efficient planning. There is also an important safety feature to a GPS system. It

helps a lost driver find his or her way and helps emergency workers in locating accident victims.

2.2.3 Theory of Database Management System

The theory of database design of the application followed the relational model concept. The relational model is “the formal model of a database that was developed for IBM in the early 1970s by Dr. Edgar Frank Codd” and “all modern relational databases are based on this model” (Jewett 2016). Furthermore, it was designed for “representing information which does not appear in UML model but is needed for us to build functioning databases” (Jewett 2016). There are four kinds of data required to store, and they rely on the normalization rule. Normalization is “the process of organizing data in a database”, and it includes “creating tables and establishing relationships between those tables according to rules designed both to protect the data and to make the database more flexible by eliminating redundancy and inconsistent dependency” (Microsoft 2013).

According (Haldar, S 2015), Database is a repository that contains many individual data items. It is however a lot more than a mere repository. A data item normally does not exist in isolation in a database. Database is related to one another. Thus a database is a collection of related data items-data items plus their relationship information. Database called SQLite will be used in the proposed application to store information. SQLite is embedded into every Android device. Using a SQLite database in Android does not require a setup procedure or administration of the database.

Database is important to the particular systems, also in our mobile application entitled Tourist Guide App because it manages and organize the different functionalities and the data that performed by the tourist. Database can help to collect all relevant in formations about certain locations.

2.3 Summary

This summary of the theories, the first theory is all about mobile application discussing how to used the application on android phones and different features. The second theory talks about the importance of GPS, how to get particular information's or possible location and their purposes focusing on the application on how it works. Mapping is a tool which can facilitate dialogue, analysis and action. We have used maps to support community groups. The last theory, which is for a database talks about the possible benefits and process how to organize the data stored, handle the different functionalities using this kind of guide for the tourist and the devices included in making this application as well as the latest surveying and navigate applications for android. In this proposed study SQlite database that is embedded in the android platform.

Chapter III

TOURIST GUIDE FOR SULTAN KUDARAT

3.1 Introduction

Tourist Guide Application is a mobile application that was used by the tourist. The mobile application was useful for the tourist by giving information about the tourist spots in Sultan Kudarat and to minimize the time of finding the direction of the tourist spots within the said province.

3.2 System Design Specifications

The proponents prefer to use the rapid application development model. The study performs a methodology efficient enough to accomplish the proposed system.

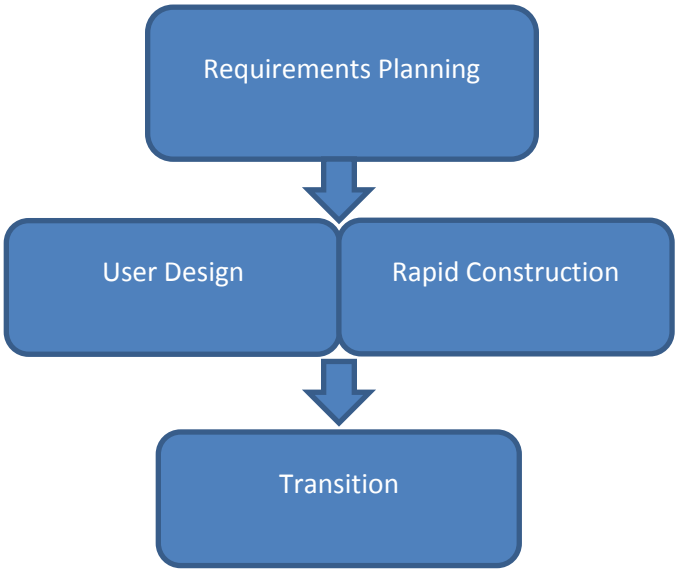


Figure 1: Rapid Application Development

RAPID APPLICATION DEVELOPMENT CYCLE STAGE

1. **Requirements Planning**

   The proponents started to brainstorm, plan and identified the possible tasks in order to make the project. The proponents formulated ideas and gather member's opinion in order to gather and analyze data coming from the prospect users. This is also the phase wherein the proponents visited and conducted an interview for their current system.

2. **User design**

   In this phase, the proponents will interact with the users in order to plan for the models and the input/outputs of the application.

3. **Rapid construction**

   This is the stage wherein the designing of user interface, applying codes, database and testing are all made by the proponents in order to make the project. The proponents must ensure that all inputted data is fit to their needs.

4. **Transition**

   Resembles the final tasks which implementation phase will be done, including data conversion, testing, change and user training. As a result, the new system will be made, delivered, and will be guided for the tourist.

3.3 The Current System

3.3.1 Physical DFD of the Current System

a. Context Diagram

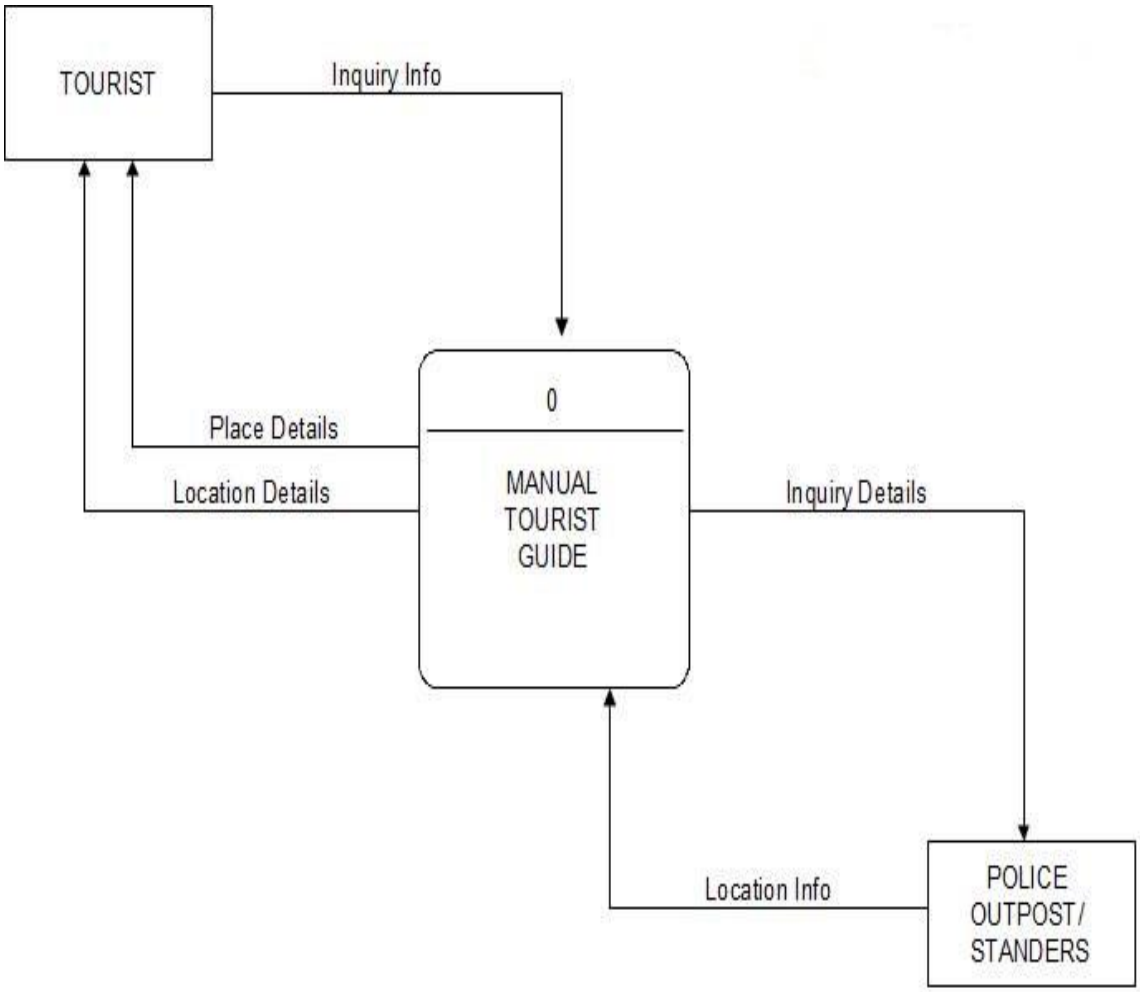


Figure 2: Context Diagram

b. Diagram 0

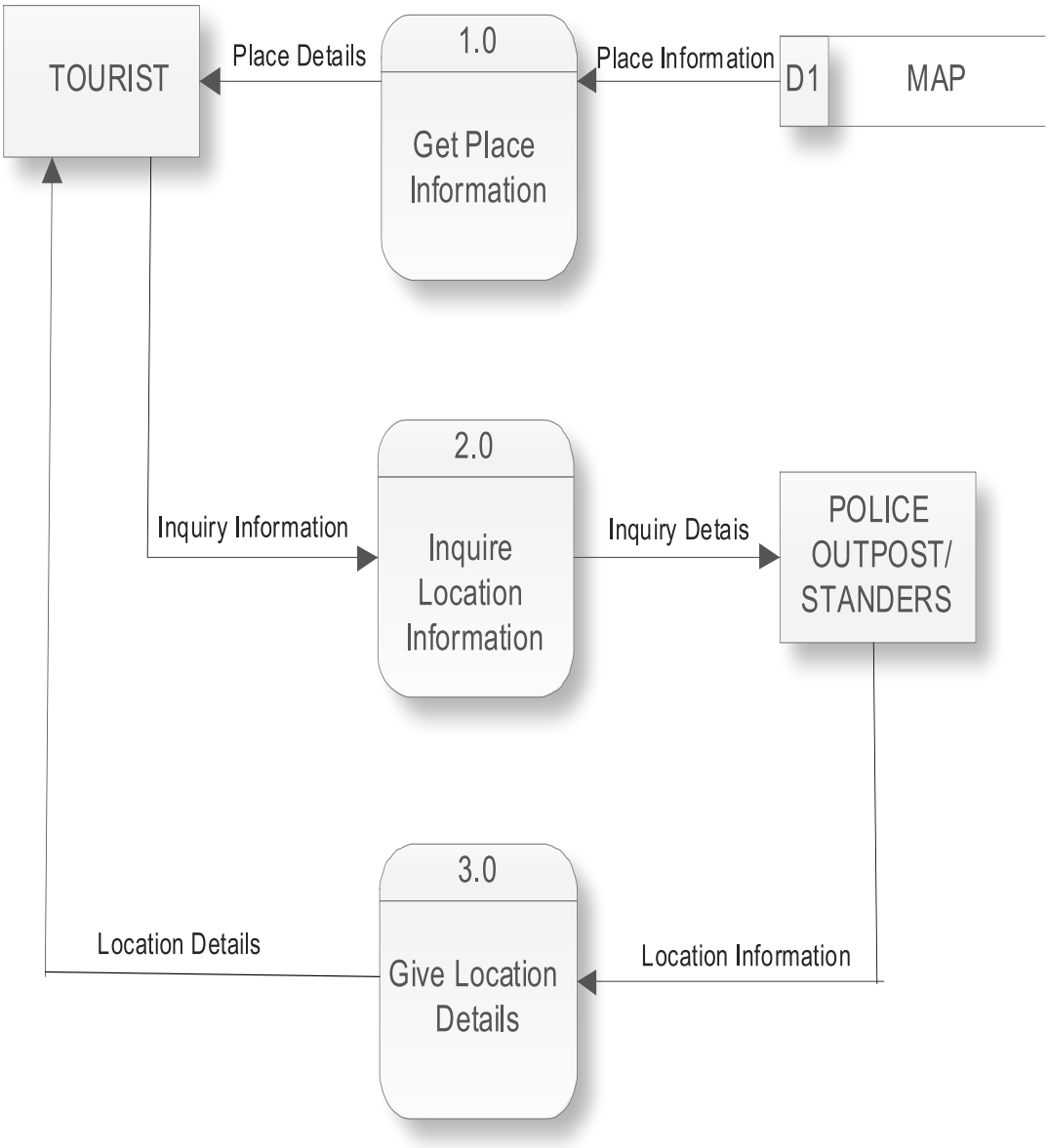


Figure 3: Diagram 0

3.3.2 Entity Relationship Diagram of the Current System

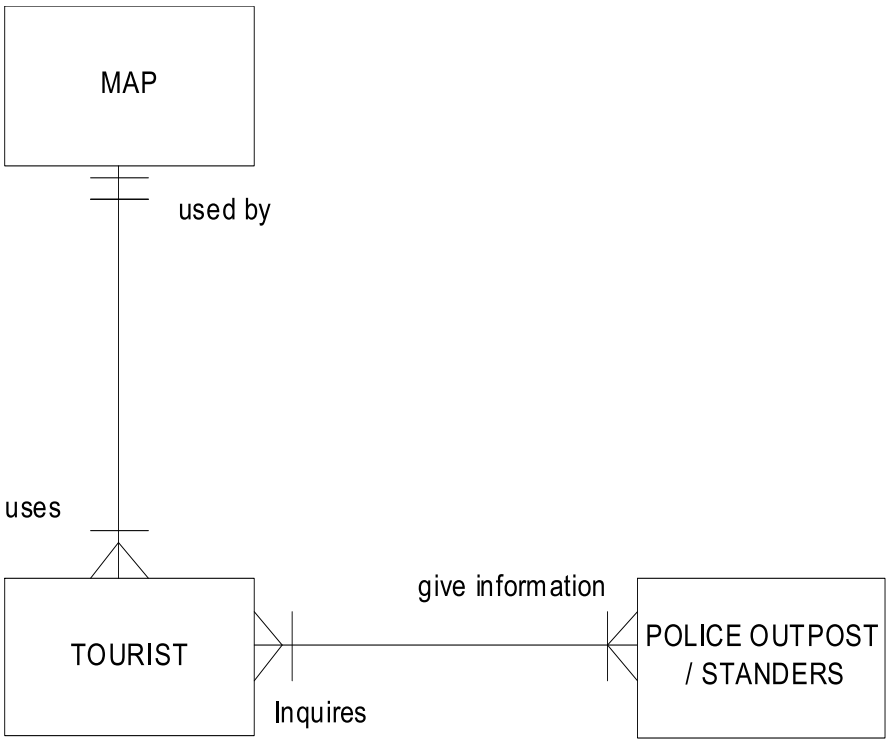


Figure 4: Entity Relationship Diagram of the Current System

3.4 The Proposed System

3.4.1 Logical DFD of the Proposed System

a. Context Diagram

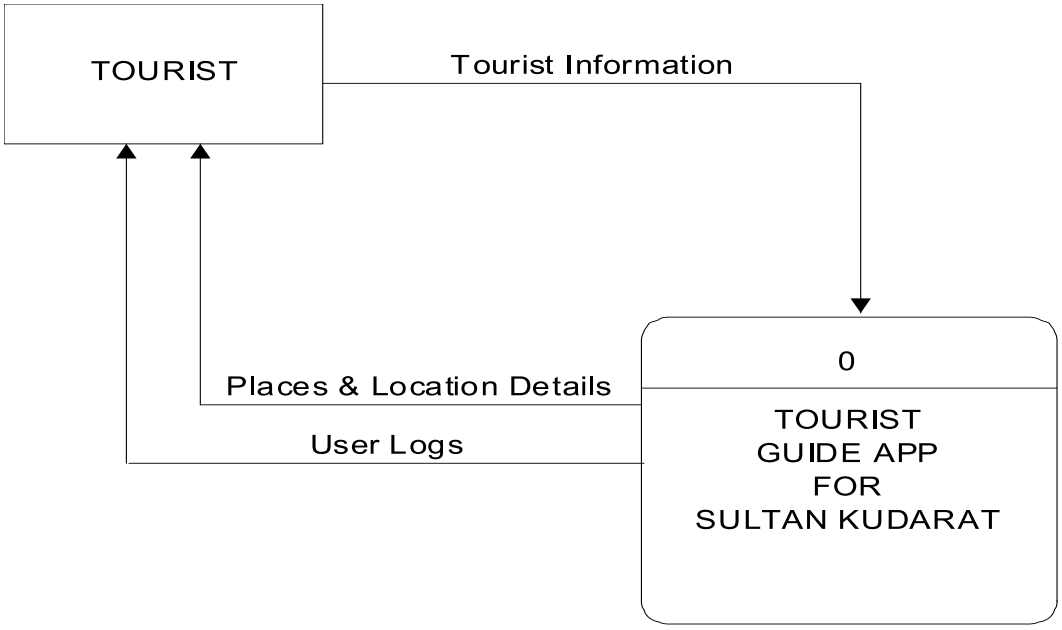


Figure 5: Context Diagram Proposed System

b. Diagram 0

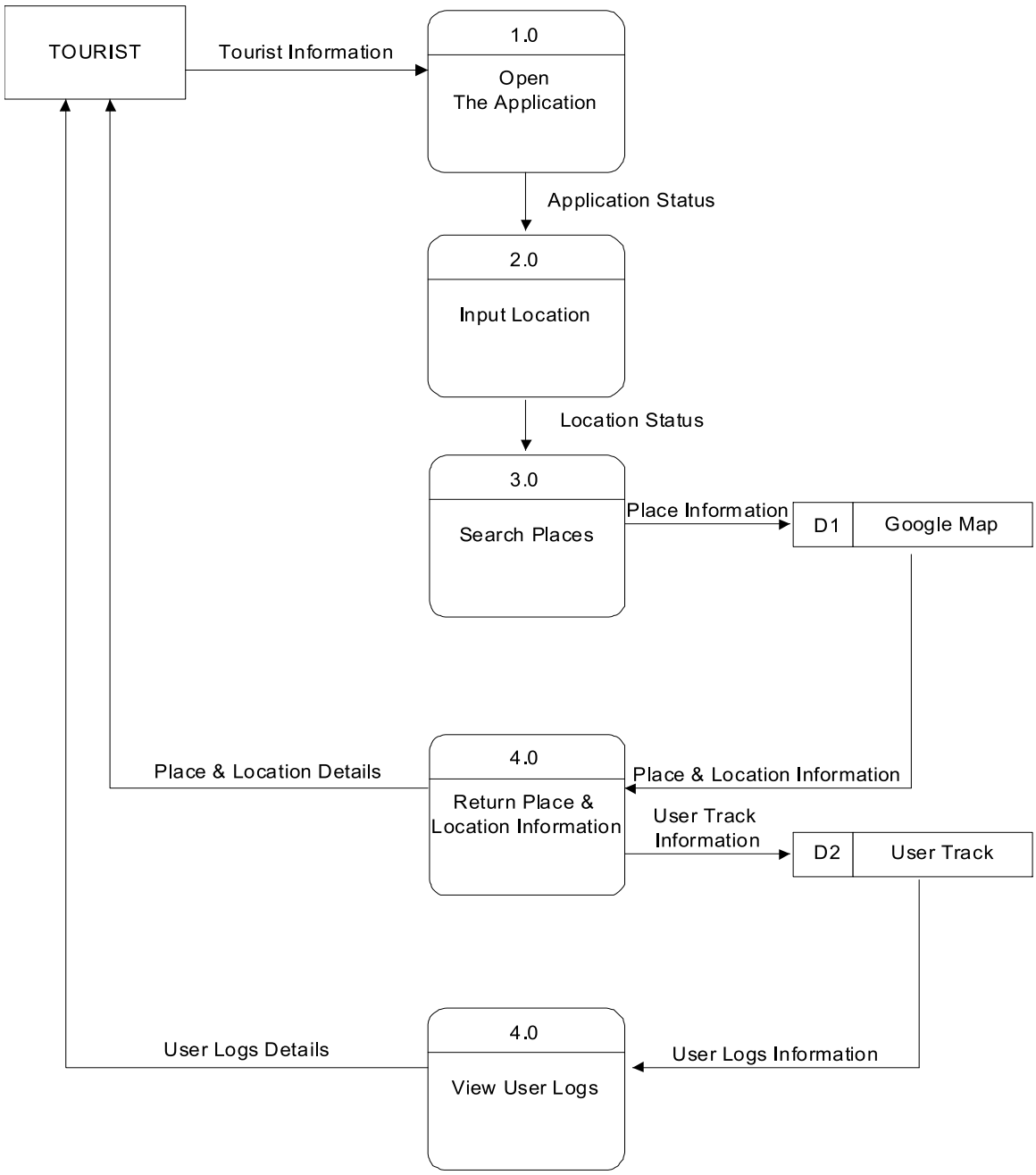


Figure 6: Diagram 0 Proposed Sytem

Flow Chart

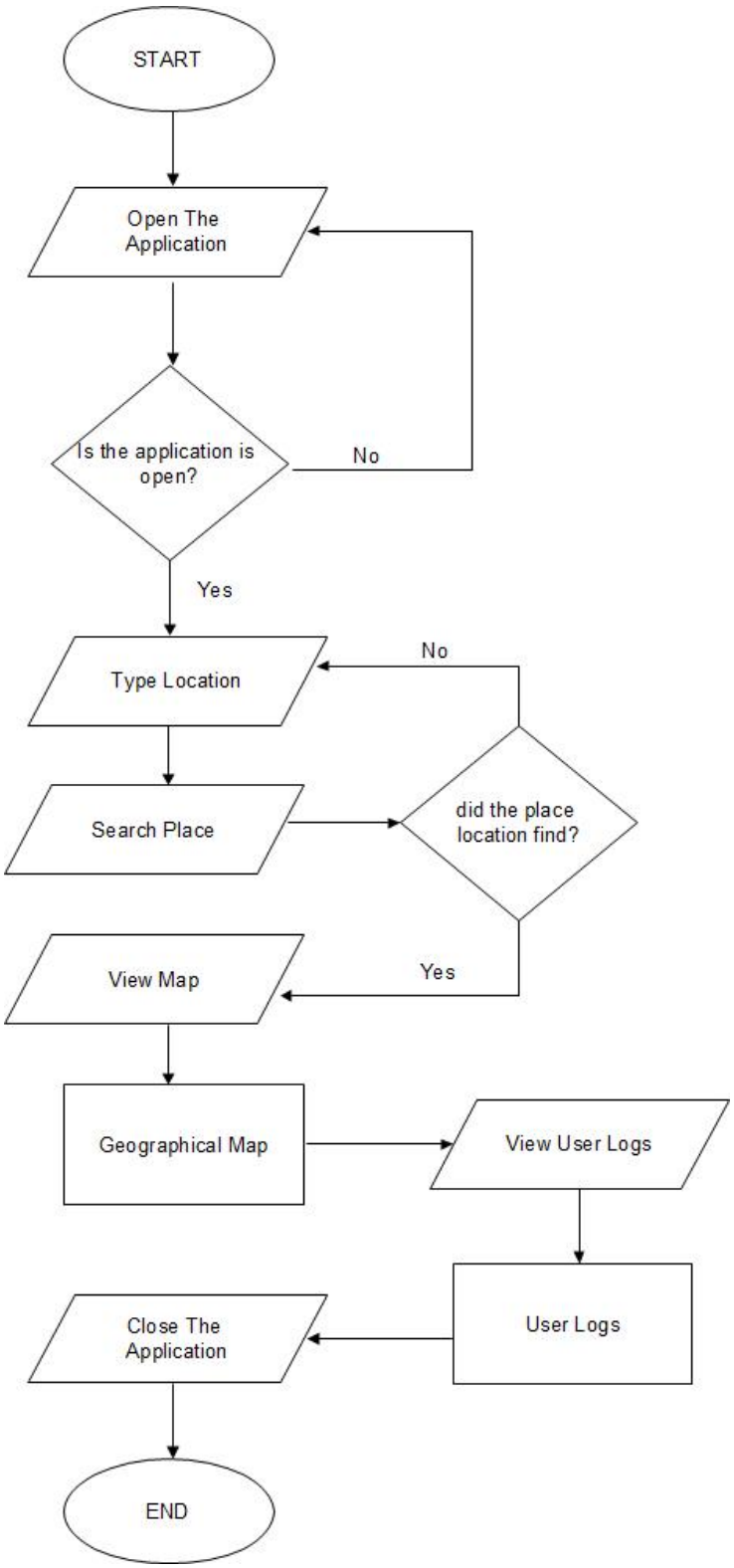


Figure 7: Flow Chart

c. Child Diagram

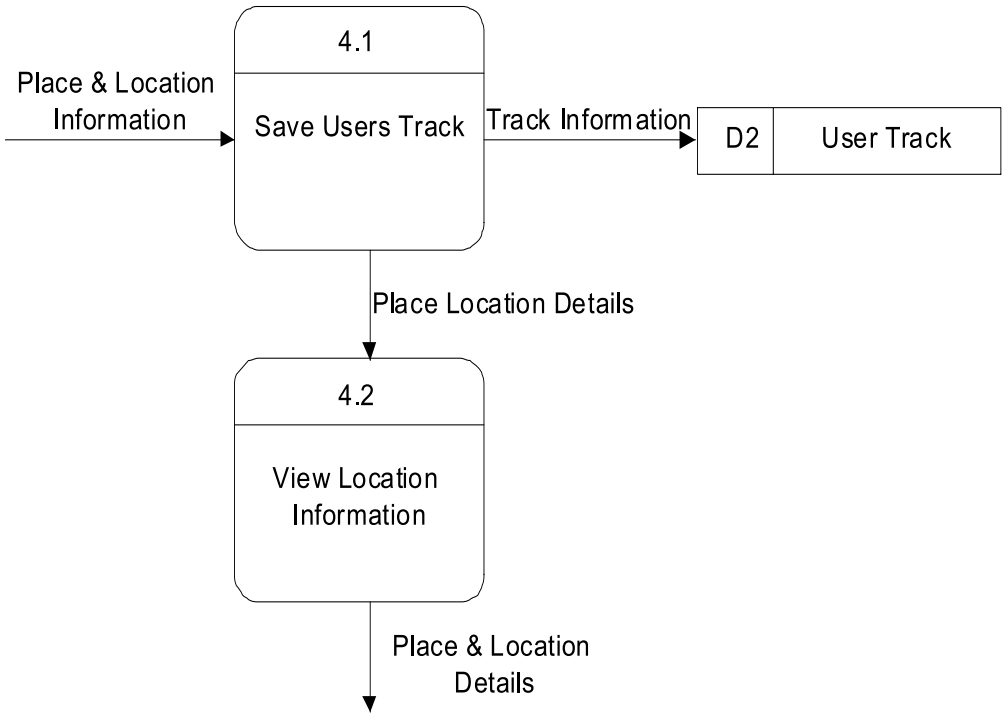


Figure 8: Child Diagram

3.4.2 Database Design and Normalization

A. Table Tourist

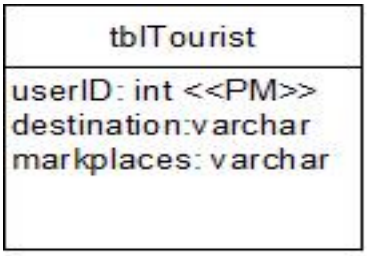


Figure 9: Table Tourist

B. Table User Logs

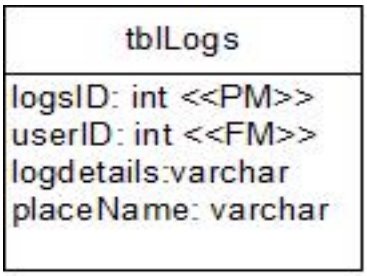


Figure 10: Table User Logs

C. Table Marked Places

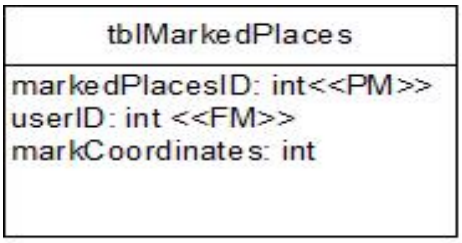


Figure 11: Table Marked Place

D. Table Information

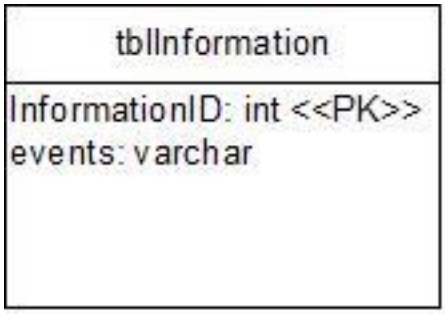


Figure 12: Table Information

3.4.3 List of Final Relatives

1. Table Tourist – is the table that holds the information of the user such as userID, destination and marked places.

2. Table User Logs – is the table that holds the users track information such as logdetails and place name.

3. Table Marked Places – is the table holds information about the user markes places such as marked places coordinates.

4. Table Information – is the table that holds information about Sultan Kudarat such as events.

3.4.4 Database Schema of the Proposed System

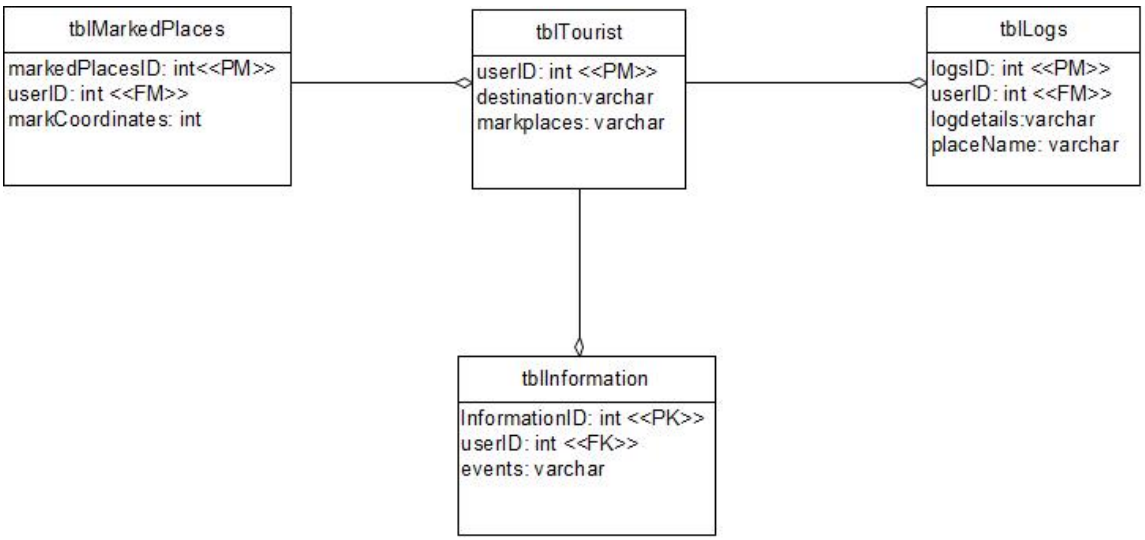


Figure 13: Database Schema

3.4.5 Data Dictionary

TABLENAME	**Tourist**						
Description	**Information of the user.**						
Alias	**None**						
Attribute Name	**Description**	**Data Type**	**Default Value**	**Example**	**Nulls Allowed (Y/N)**	**Length**	**Validation Rule**
userID	id number of the tourist	int	None	0001	N	10	none
destination	Destination of the user	varchar	None	Sultan Kudarat	N	30	none
Mark places	Mark place of the user	varchar	None	esperanza	N	30	none

TABLENAME	**User Logs**
Description	**logs informaion of the user.**
Alias	**None**

Attribute Name	Description	Data Type	Default Value	Example	Nulls Allowed (Y/N)	Length	Validation Rule
logsID	id number of the users logs	int	None	0001	N	10	none
userID	Id number of the user	int	None	0001	N	10	none
markPlaces	Mark place of the user	varchar	None	esperanza	N	30	none
placeName	Name of the place	varchar	None	Tacurong	N	30	none

TABLENAME	Marked Places						
Description	Marked places informaion.						
Alias	None						
Attribute Name	Description	Data Type	Default Value	Example	Nulls Allowed (Y/N)	Length	Validation Rule
markedPlacesID	id number of the mark places	int	None	0001	N	10	none
userID	Id number of the user	int	None	0001	N	10	none
MarkCoordinates	Coordinates of the mark places	int	None	123.11, 131.5553	N	50	none

TABLENAME	Information						
Description	Information about sultan kudarat.						
Alias	None						
Attribute Name	Description	Data Type	Default Value	Example	Nulls Allowed (Y/N)	Length	Validation Rule
informationID	id number of the informatio	int	None	0001	N	10	none

	n						
userID	Id number of the user	int	None	0001	N	10	none
events	Information of the events	varchar	None	kadayawan	N	50	none

3.4.6 Business Rules

Business Rule 1: The tourist must follow the track givin by the application.

Constrained object: TOURIST and USER LOGS (Entity)

Constraining object: TOURIST and USER LOGS (Entities)

3.4.7 Input/Transactions/Output Screens

- **Search Places**

  Input screen –enter places.

  Transaction – search places.

  Output – view geographical representation of the searched places.

- **Saving borrowed book information**

  Input screen –Information about Sultan Kudarat.

  Transaction – Views the information.

  Output – the system views the brief history of the Sultan Kudarat and the events.

- **Mark Places**

  Input screen – Enter mark place.

  Transaction – Mark the place.

Output – the system will put mark on the map.

- **View Logs**

  Input screen – Users track information.

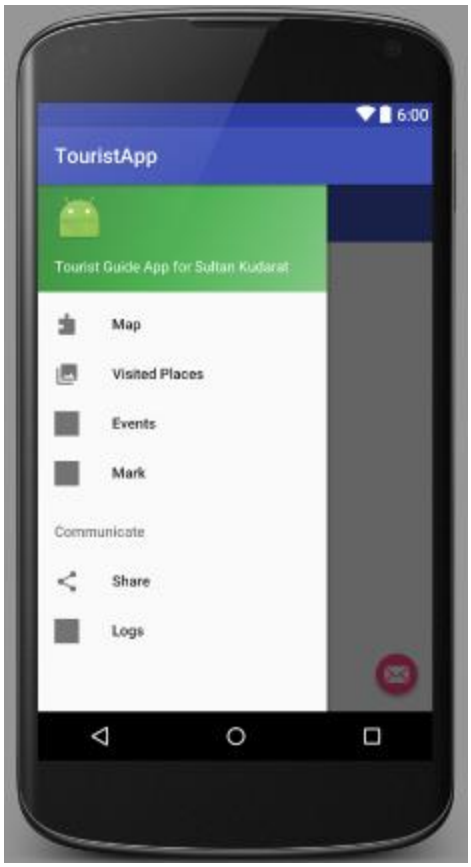
  Transaction – view user logs.

  Output – the system views user logs such as destination.

3.5 The Working System

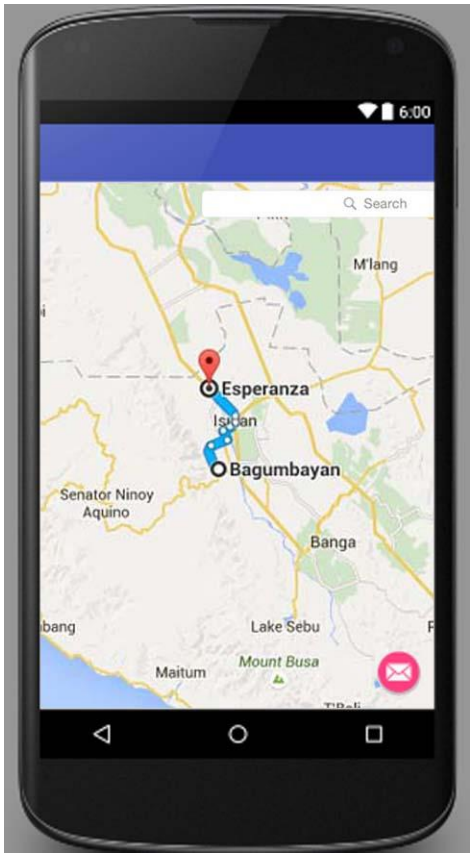
3.5.1 The splash screen. The starting view of the application.

3.5.2 Navigation Bar. The navigation bar of the application that shows the menu such as map, events and etc.

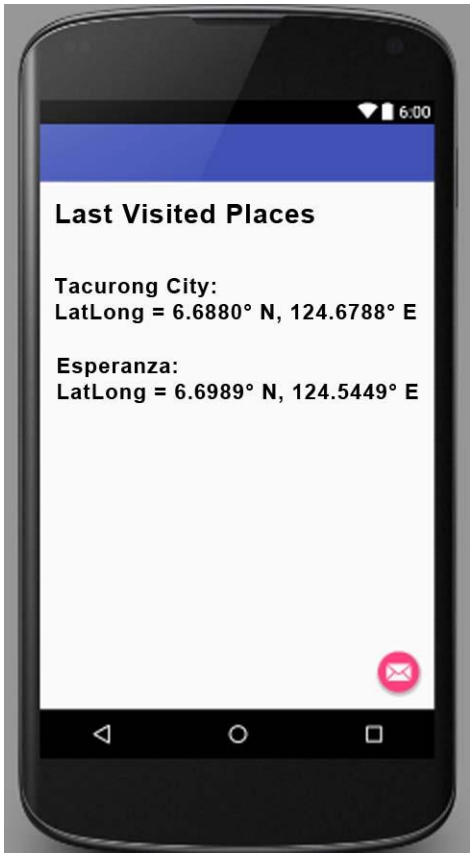


3.5.3 Navigation Header. It shows the name of the system.

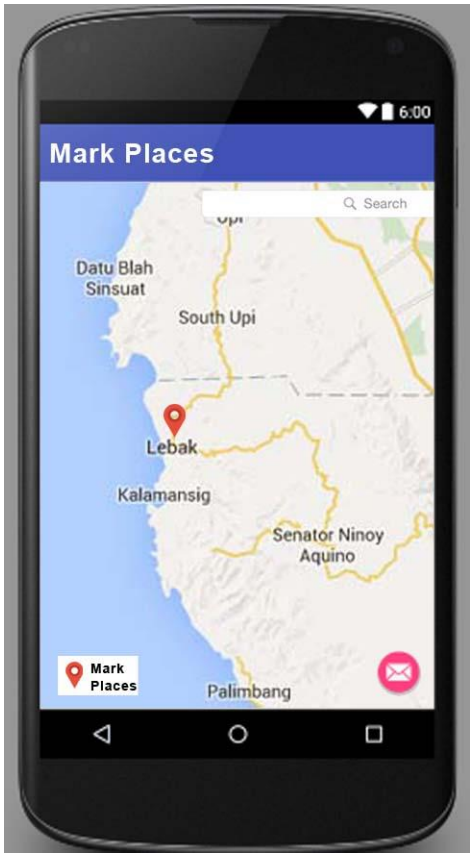
3.5.4 Map. Views the geographical map of Sultan Kudarat.



3.5.5 Visited Places. It views the recorded visited places of the user.



3.5.6 Marked Places. The user can mark places in the map.



3.6 Hardware and Software Requirements

8.1.1 Hardware	REQUIREMENTS
Android Phone(mobile or tablet)	That can access a mobile data or Wi-fi
RAM	Minimum 512MB RAM(1GB is better)
Available Phone Storage (at least 1GB)	

8.1.2 Software	REQUIREMENTS
Android Operating SystemAndroid	Android Version 4.4(Kikat)
Android Operating System Android	Android Version 5.0(Lollipop)

3.7 Summary

This chapter discusses the methodology used by the proponents in developing the mobile application in which rapid application development (RAD) was adopted. It discusses the methods in developing the mobile application. The chapter also presented the diagrams in which shows the different relationships of tables inside the database that hold the information.

Chapter IV

PERFORMANCE ANALYSIS

4.1 Introduction

The performance of the system is the main issue of designing, developing and configuring the system. The system should not only run but to work in its designated task to meet the expected output. Performance analysis or dry run test is conducted by the proponents to evaluate if the objectives of this study are fulfilled by the proposed system. This analysis test will evaluate if the specified works of per modules in this mobile application is work as it is e.g. the validation and other constraints is meet by the system.

4.2 Experimental

Module	Expected Output	Actual Result
4.2.1 Test Case 1 Search Places	The system will search places.	Successful
4.2.2 Test Case 2 Mark Places	The user will add marker to the selected place.	Successful
4.2.3 Test Case 3 View Visited Places	The system will view visited places.	Successful
4.2.4 Test Case 4 View Events	The system will view list of events.	Successful

4.3 Results and Analysis

Search Places

4.4 Summary

This chapter contains the experimental and analysis test conducted by the proponents. The mobile application has different transaction with the used of functionality test, it is proven that the mobile application responded correctly based on the test employed by the proponents. It proves that the application is fully-functional and can use of a tourist.