FEASIBILITY STUDY
YAMUCOLOMBO

18.03.2016

L.C.J. Gamage
130166P

TABLE OF CONTENTS

1. Introduction

1.1 Overview of the Project
Choosing the correct bus route to travel somewhere is not an easy thing specially if you are not familiar with the area. As a solution this is going to be an android application where you can find bus routes to travel from a place to another in the Colombo suburbs.

Here the user will have to select the starting place and the destination. User can either select a place on the map or else take the current location through GPS. Then the application will find the optimum routes and display them so that the user can choose one of them. User can comment on the route and confirm the time duration of the journey which will then be used to find the best route next time. User will be able to view the current progress of the journey on the map.

1.2 Objectives of the Project
- Design and implement a bus route management system for the passengers.
- Provide user friendly application to find the best bus route between the destinations.
- Give the users a choice to decide upon which route is suitable
- Optimize the reliability of the application through using past user experience information.

1.3 The Need for the Project
When people travel in a large city like Colombo where there are huge number of bus routes, it is not easy to find out which bus they should get on to reach the destination. Even though some may know some routes, there can be much easier, cost effective and low time consuming routes that they are not aware of. Suppose someone knows all the routes, even though he/she may not sure which route would be better at the time. Therefore this this application helps all the people in those categories. This will help them to save the time and money and above all it will save them from getting lost.

1.4 Overview of Existing Systems and Technologies
There is an existing application on Google Play Store [3] which is much similar to this one. But from the user experience that app still have some issues in giving the correct path. Moreover it does not produce the routes which is low in distance and cost effective. It just gives all the possible routes with some of the main bus stops. Therefore it also does not have the feature of considering past user experience for suggesting the best route.

This proposed application will be an android application and the location details and paths will be taken from Google map APIs [2] and Google Places APIs [1]. For the server side, PHP will be used and MySQL database will be used to store the relevant data and information. Android Studio [5] will be the main tool for the development of the application and various other tools will be used for documentation purposes.

1.5 Scope of the Project
The users of this system will be all the public who wants to travel in Colombo suburbs by bus.

- Users will be able to select the starting point and the destination of the journey and search for buses.
- Users will be able to mark only the destination on the map and the starting point will be taken by the application automatically though GPS.
- Users will be able to find out what are the buses that travel near to their current location.
- Once a user searches for a route in any of the methods, he/she will be given all the possible routes [4] which can be used to reach the destination.
- Users will be able to decide a route upon the time, cost, distance and traffic at the moment.
- Once a route is selected, he/she will be shown the map with the current progress of their journey.
- At the end of the journey, the duration the journey and time of the day will be confirmed and the user will be asked for any comments about the selected route (Traffic Conditions, etc.).
- These time details will be used when another user searches for the same route to find optimum route. Route suggestions will be calculated considering the durations of the previous users and time of the day which they travelled. Then that person will receive more reliable information because it is calculated from previous user experience. Algorithms will be optimized to avoid false information from the users.
- Once a user select a route, they can view the comments of the previous users on that route and get an idea about the feasibility of the route.

1.6 Deliverables
- This will be an android application for the users to find the bus routes.
- There will be GUIs with google maps to select the starting point, destination, to view the current location and to view the progress of the journey.
- All the route calculations will be done through a web server where the database will be hosted.

2. Feasibility Study
2.1 Financial Feasibility
. As this is an android application, and is used by the general public, the client of the application does not need to have any hardware tool for himself. As the backend of this application is hosted in a web server, the client will have to maintain the server of this application. There will be a considerable cost for this service. Apart from the initial cost of developing, this would be the only cost the client will have to bare. As this is a very helpful application for anyone who travels in Colombo by bus, the client will be able to easily overcome the maintenance cost through in app advertisements. Therefore this application is quite financially feasible.

2.2 Technical Feasibility

The main languages used in this android application will be java, PHP and XML. The logics of the mobile application will be written in java and XML will be used for designing user interfaces. The backend (server side) logic will be developed using PHP. Moreover all the data will be stored in a MySQL database which is hosted in the web

server. Google maps API for android will be used to receive locations, show routes and get time, traffic and distance information. As all the above technologies are available and usable, this application is technically feasible.

2.3 Resource and Time Feasibility

As Google map API v2 is supported only by phones which has android version 2.2 or higher, this application will run on any android phone which is higher than android version 2.2. Therefore it covers a huge percentage of the total android phones available in the market. The application development can be done on any machine with average performance.

Feasibility study and requirement specification will be finished by the end of March. Then the system designing will be done and relevant design models will be developed. Actual software implementation will also be done in iterations according to the RUP model. Developing the user interface, database, frontend-backend connections, getting user inputs, calculating the possible bus routes will be finished by the end of April. Then optimizing the results and writing the algorithm for coming up with the optimum route will be developed thereon. This process will be carried on until mid of May. Finally the system will be tested thoroughly and the final product will be demonstrated during the first week of June.

2.4 Risk Feasibility

As we have to get some inputs from the user and show them various kinds of results, there will be a considerable risk in coming up with good user-friendly interfaces and a design. Otherwise the users will not get attracted to the application and there's a risk of getting negative feedbacks.

As this application rely very much on Google APIs, there's a risk which those functionalities will be changed or the information provided becomes unreliable. A small change in those APIs and their services can affect this application very much.

If some users give false feedbacks on a particular route, that will considerably affect the reliability of the application because other users may see those feedback and take decisions based on them.

Algorithm which decides the optimum route should be quick and reliable. If it takes long to calculate, then the user will have a negative impact on the application. Therefore there's a risk in coming up with the best algorithm.

As the backend is hosted in a web server, the application will immensely rely upon the server. Any server breakdown can cause the application not worthy and few hours of server breakdown can lead to a loss of many valuable customers. Therefore there's a risk in buying a good reliable and efficient server for the system.

The information provided should be up to date. If there's a change in a bus route, it should be updates in our system also. Otherwise the users will be provided with false information and the application will be rejected by the users.

2.5 Social/Legal Feasibility

As we are using Google APIs in this application, we have to adhere to their Terms of Service [6]. However our application does not go against any of their terms. As this

application is very much helpful to the general public, there's no any bad impact on the society as well.

2. Considerations

- Efficiency
  As this application calculates optimum routes in real time, the algorithm for that should be much efficient because users won't want to wait long to get the results. Therefore this should have a considerably high efficiency.
- Reliability
  This information provided by this application should be very reliable. Any updates in the routes should be available in the application as well. If a new route is added or an existing route is modified, those should be maintained in our system as well. Otherwise the users will not receive the optimum route and sometimes they may receive an impossible route.
- Availability
  The server running the backend should be available all the time because this application relies very much upon that.
- Performance
  The server should have a considerable amount of performance because it should be able to handle all the user requests simultaneously and calculate the routes for all of them efficiently.

4. References

[1] "Google Places API," Google, [Online]. Available: https://developers.google.com/places/android-api/. [Accessed 06 March 2016].

[2] "Google Maps Android API," Google, [Online]. Available: https://developers.google.com/maps/android/. [Accessed 06 March 2016].

[3] "Colombo Bus Route," Google Play, [Online]. Available: https://play.google.com/store/apps/details?id=cbr.arima&hl=en. [Accessed 06 March 2016].

[4] "Algorithms to find routes," StackOverflow, [Online]. Available: http://stackoverflow.com/questions/483488/strategy-to-find-your-best-route-via-public-transportation-only. [Accessed 03 03 2016].

[5] "Android Studio," Google, [Online]. Available: http://developer.android.com/sdk/index.html. [Accessed 03 03 2016].

[6] "Google APIs Terms of Service," Google, [Online]. Available: https://developers.google.com/terms/. [Accessed 16 03 2016].