

Smart Travelers App Using Flutter

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Abstract- Public Transport Networks(PTNs)which is difficult to use when the user is unfamiliar with the area they are traveling to their destination. This is true for both infrequent users(including visitors)and regular users, who need to travel to that areas with which they are not acquainted. In these situations, adequate on-trip navigation information can substantially ease the use of public transportation and the driving factor in motivating travelers to prefer it over other modes of transportation. However, estimating the localization of a user is not trivial, although it is critical for providing relevant information. we assess relevant design issues for a modular, cost-efficient user-friendly.on-trip Navigation service that uses position sensors,by helping travelers to move single-occupancy vehicles to public transportation systems. The communities can reduce traffic congestion as well as its environmental impact. Here, we describe our efforts to increase the satisfaction of current public transportation users to ride.

Keywords- GPS, Flutter, Dart, Firebase, Google cloud.

I. INTRODUCTION

There are buses made available for passengers travelling long distances, butmany passengers don't know the complete information about these buses. The complete information includes the number of buses going to the required destination, bus number, bus timings, the rate through which the bus would pass, time taken for the bus to reach the destination, maps that would guide the passenger with User route, track the current location of the bus and provide the correct time to reach its destination. The proposed system overcomes the problems stated above. The system carries an Android application that gives necessary information about all the buses. This information overcomes the problems faced in the previous application called "Pane Bus Guide". The platform chosen for this kind of system is android. The reason is, the Android Operating System has come up on a very large scale and is owned by almost every person. Android is a user friendly platform, thereby enabling ease of access for all the users. The number of applications made for the Android Operating System is increasing on a large scale ever since its advent. So, We planned to built new application(Smart Traveler App) by using Android Studio and Flutter, which will

provide all the information about the bus Routes, Timings and Destinations.

II. RELATED WORKS

A. Similar Existing System

Around the world, there are many vehicles tracking system have been developed. These systems have their own uniqueness. An example of GPS Tracker is developed to provide vehicle security and GPS location for personal and fleet vehicle owners. This device combines with advanced technology and safely features to keep the vehicles secured whenever they go. Controlling and Monitoring the vehicles can be done in an easy and convenient way. LiveView GPS designed to provide vehicle security and GPS location for fleet vehicle owners. Now they have variety of option to choose their bus and paid their fees, and the all are monitoring by Admin app. They have a device that combines with advanced technology that keep the students are perfect to pick their bus at right time. Google cloud and Firebase are used in their app. This App is made by flutter and Dart. It provides huge list of features like, Fees paid option, transit tracking, distance calculation, historic tracking data auditing and etc.

B. Techniques Used

Nowadays, people used many kinds of different operating system in their smartphone such as iOS, Android and many others. Thus, developers need to develop many kinds of platforms using different frameworks, architectures and contents to build an equal application for all. The cost of implementation for the multiple platforms are high. Developers also need to have the expertise on the various platforms. Developers are introduced to use the alternative way or approach for the multiple implementation such as a cross-platform development approach. There is also an alternative way for developers to less the workload which they can implement and applying reusability techniques in developing equal applications. Thus, by using the two mentioned techniques, they could choose any suitable approaches along with the reusability techniques in using the existing components of existing systems into a new platform that they want to develop.

a) Cross-platform development

Cross-platform development approach can be classified into few approaches such as web approach, hybrid approach, Interpreted approach and cross-compiled approach. These approaches have their own advantages and challenges in developing a multiple platform system.

b) Reusability Techniques

The idea of reusability has been proposed for a long time. Instead of developing an invention of solutions, Ecole et al on 2014 has claimed that it is easier if developers innovate a new product or system by using the applicable information that can be extracted from the previous developed solutions [6]. There are various reusable approaches that can be applied such as software product line approach (SPL) in extracting components from existing system and componentbased approach (CB) in implementing extracted components into new development. The selection of suitable approaches typically not defined in a proper way. Each project finds its own approach based own the time management and budget pressure. The selection of the right approach requires careful consideration of multiple criteria and careful balancing among application requirements, technical characteristics and financial issues.

III. ARCHEITECTURE FOR SMART TRAVELERS APP

The architectural style of this system is a Three tier layer. The system is designed to be used on a mobile device application with the connection to a server using the Internet. Mobile application’s core operation is to update the user interface with the newly requested information based on the user’s input and retrieve data from a data store. This system has few modules which can be break into three partitions; (i) Driver App, (ii) Student App (iii) Admin App. Those modules have their own characteristics.



Fig.1.Driver App



Fig.2.Student App

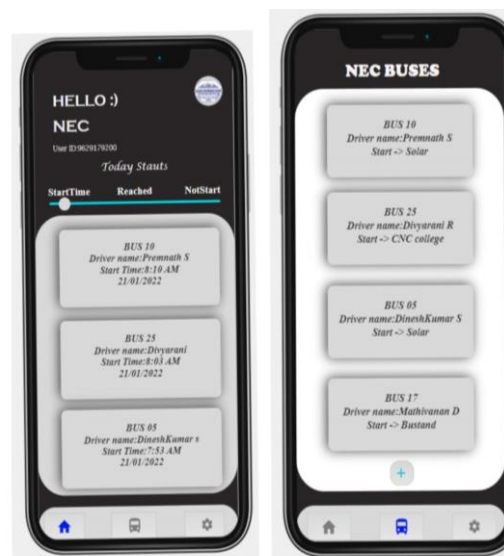


Fig.3.Admin App

Transportation module describe how the bus is tracked by installing the GPS Tracker. The GPS satellite

transmits microwave signal to GPS bus tracker device that allows the device to give related information such as location, bus speed, estimation time arrival, and direction. This allows GPS tracker device to update the historic navigation data in real time. The data received by GPS satellite is then transferred into GSM or Cellular Network for the location of the bus map in the mapping system. The recorded navigation data is stored in an internet server. The student and admin will receive this historic navigation data from driver App in SMART TRAVELERS APP when they make a request to check where the current bus is. For the admin app monitor, how many student in the each bus and how many students are paid their fees and track the all bus location. Once the driver press the stop button the location sharing will be terminate. Next, admin module describes how the bus driver and management team to manage the location and information. Admin module is responsible to manage and update all static information about bus such as new buses, routes into database. Besides that, admin also keep in touch with end user through feedback session to maintain the reliability and the performance of the system. In addition, admin module contains a web interface for an administrator that shows the summary of the bus being tracked. It will display a map using the Google Static Maps API, with vehicle and location data from database. Furthermore, admin also can monitor bus stop frequently used by user for further bus route improvement.

To fulfill requirements needed in developing proposed application system, development team used some apparatus to reach the target

a) Google Map API

Our proposed system will be interfaced with Google Maps API. Google Maps API provides our application with full access to Google’s worldwide database of over 100 million businesses. By using this APIs, we can show our users a filtered list of places that are most relevant to them.

b) Firebase Real-time Database

The Firebase Real-time Database is a cloud-hosted database. Data is stored as JSON and synchronized in real-time to every connected client. Drivers will send the data of location bus to the database by using the android application platform. Then, Firebase Real-time Database will automatically receive the updates with the newest data. Our system will then fetch the update data of a bus from the same database. The data in Firebase Realtime Database is synced across all clients in real-time and remains available although our application goes offline

c) GPS racking

Metadata

The most sophisticated background location tracking & geofencing module with battery-conscious motion-detection intelligence for iOS and Android.

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The plugin's Philosophy of Operation is to use motion-detection APIs(using accelerometer, gyroscope and magnetometer) to detect when the device is moving and stationary.

- When the device is detected to be moving, the plugin will automatically start recording a location according to the configured distanceFilter (meters).
- When the device is detected be stationary, the plugin will automatically turn off location-services to conserve energy.

d)Flutter

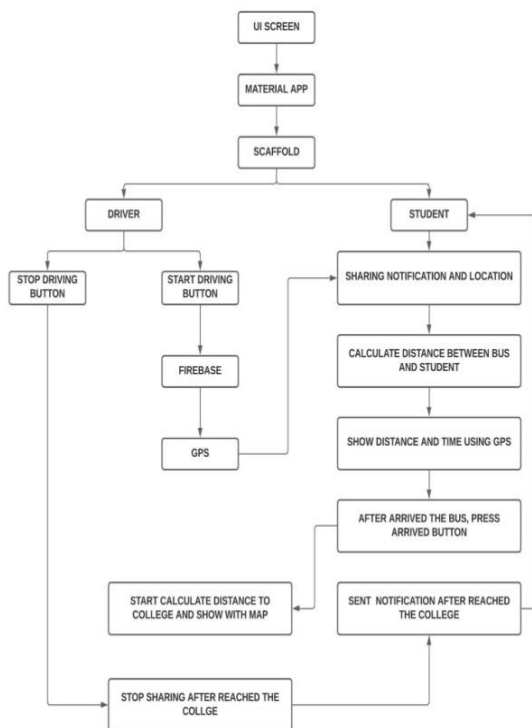


Fig.4. Block Diagram of Proposed System

IV. DETAILS OF THE COMPONENT

Flutter is an open-source UI software development kit created by Google. It is used to develop cross platform applications for Android, iOS, Linux, Mac, Windows, Google Fuchsia, and the web from a single codebase. The first version of Flutter was known as codename "Sky" and ran on the Android operating system.

e) Dart

Dart is a client-optimized language for fast apps on any platform.

(i) Optimized for UI

Develop with a programming language specialized around the needs of user interface creation.

(ii) Productive development

Make changes iteratively: use hot reload to see the result instantly in your running app.

(iii) Fast on all platforms

Compile to ARM & x64 machine code for mobile, desktop, and backend. Or compile to JavaScript for the web.

TABLE I: COMPONENTS AND PRICE DETAILS

COMPONENTS	PRICE
Cloud Storage	1000*
Google Map	1200/pm
Firebase	500*
Android SDK	-
Flutter SDK	-
Visual Studio	-

Keywords of Symbols:

- * -> Pricing Increased based on usage
- /pm -> Pricing for per month
- -> Open source

TABLE II: RESULT AND COMPARISON ON THE PERFORMANCE FUNCTIONALITY

Functionality	Existing System	Proposed System
Updating Location	Yes	Yes
Display Distance and Time	No	Yes
Fees paying Option	No	Yes
Based on Application	Java	Flutter & Dart

V. CONCLUSION

In this paper the value of best information systems, demonstrating a number of widely deployed tools and evaluations of those tools that show their utility. Specifically, described the system which provides riders tools across a Smartphone and interfaces. This paper is demonstrated a real-time mobile trip planning tool and also a method for crowd-sourcing the detection of errors in public transit data. Finally, the evaluations that show improves satisfaction with public transit, reduces wait times, increases transit usage, encourages walking, and improves perception of safety among riders.

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