

YASHODHARA (PRESERVING THE GLORY OF INDIAN TOURISM)-VIRTUAL TOURISM APP

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ABSTRACT

India is known for its culture and history across the world. India is a country which is famous for tourism and its culture. But the problem is many of us don't know many places in India, don't know the cultural and historical importance about the place and also not everyone can travel across India. So, in-order to uphold the importance of Indian tourism, to give deep insights about the places, to support virtual tourism for those who cannot travel, to provide the smooth travelling for the people and to introduce many places for the travel enthusiasts, we have come up with an idea called YASHODHARA. This System is an Android Application and uses FLUTTER as its Front End and FIREBASE with GCP as its Back end. The System is exceptionally solid as it utilizes foursquare API to get the spots which are precise. The System is truly adaptable in changing spots and utilizes Google guides to show places if the client wishes to. Since we are using Flutter as a framework the UI will be crystal and clear with beautiful graphics.

Keywords: Flutter, Firebase, IDE, API, GCP, Android, IOS.

I. INTRODUCTION

Flutter is an express stage structure that goes for growing elite portable applications. Flutter is openly discharged in 2016 with Google. Not exclusively can Flutter apps keep running on IOS and Android, yet additionally Fuchsia, Google's cutting-edge working framework, picks Flutter as its app level structure. Flutter is special framework. Rather than utilizing web sees or relying upon the gadget's OEM contraptions, Flutter delivers each view parts using its own predominant delivering engine. This nature offers credibility to gather applications that are really unrivaled. Flutter bolsters stateful harm reload while creating, which look as a main consideration for supporting advancement cycle. Stateful harm reload is basically actualized by infusing refreshed source symbol into the working as Dart virtual machine without modifying the internal design of the application, consequently all advances and activities of the app will be protected after harm reloading. In this mean, Flutter supports using shared packs contributed by various creators to the Flutter and Dart frameworks. This grants to quickly produce the application without making everything sans arrangement. Existing bundles empower many use categories, for instance, making system demands (HTTP), custom route/course dealing with, joining with gadget Android Programming Interfaces (such as universal resource locator launcher and battery), and utilizing outsider stage SDKs (such as Firebase). We must use Flutter because: Flutter utilize Dart, a quick OOP with a few valuable highlights. Flutter has its very own user interface parts, alongside a motor which can be used to deliver them on the IOS and android stages. Most of those UI parts, straightforwardly out of the compartment, fit in with the standards of Material Structure. Flutter applications can be created utilizing Vs Code that is fundamentally the same as Android Studio.

II. RELATED WORKS

Tourism is an information-centric industry with a long value chain, which these two features have led to the introduction of new information and communication technologies as the main artery of this industry. Information and communication technology has been the most important factor accelerating the tourism industry, changing its distribution systems and providing access to timely information on accommodation and destination at all stages of distribution [1]. To further develop the control execution and computer generated reality of the virtual the travel industry framework, the plan of the virtual the travel industry framework with the qualities of social the travel industry assets is completed by utilizing the three-dimensional the travel industry augmented reality technology. The development of virtual reality system for the cultural tourism resources is taken based on the reconstruction of 3D graphics of virtual tourism system and the analysis of virtual scene simulation [2]. This paper defines the key technologies and development tools involved in the system. According to the survey in this paper, tourist market in recent years and the proportion of self-service

tourists in the tourism market is been increasing year by year. The level of tourism related enterprises mainly involves scenic spots, lodgings, hotels, tourism network marketing. All kinds of tourism related enterprises have more urgent demand for information technology, hoping to conduct in-depth analysis of tourist's behaviour and habits [3]. A Survey: The authors have discussed that many studies are using linked open data to address the problem of location-based recommendation. The highest accuracy was got when Foursquare API was used for Location Based Recommendation [4]. The focus of the study was to propose an interactive mobile application for tourism sites in Batam. The interactive mobile app provides information and map of tourism sites in Batam. The author says that the app uses an image-marker to show an object or information based on the image. The application provides a list of tourism sites in Batam, the information regarding the tourism site, and the map of the tourism site [5]. The authors have discussed that tourist reviews are information sources for travellers to know about tourist places. Shockingly, a few audits are immaterial and become uproarious information. Tourists may be confused about whether to visit the tourist place due to diversity of sentiments. Sentiment classification methods can help to organize the sentiments into positive and negative. The mobile app provides a user-friendly way to analyse tourist sentiments by aspects. Using their smart phones, tourists can get useful, and noise suppressed information to help them make decisions when they visit any tourist place [6]. The learning expected to configuration electronic gateways for the travel industry organizations to make adaptable the travel industry exercises for vacationers. The proposed solution related to the problems experienced in the field of Tourism is to build a portal that is integrated with tourists and various service providers in the tourism sector such as tourist attractions, hotels, restaurants, tourist attractions, transportation, souvenirs, and also people who want to become tour guides in an area. The system provides facilities for its members who want to travel by providing various choices of the most suitable destinations [7]. Through analysing Luoyang's urban image promotion strategy, the paper has an insight into clients' social experience interest in voyaging, and plans a nearby culture-included metropolitan the travel industry APP. The paper proposes to design a Luoyang urban culture tourism APP to promote culture and fulfil traveling functions oriented towards audience demand and interest. Meanwhile, based on the presentation strategy of local culture in APP, the paper designs Walking in Luoyang APP [8]. With regards to the travel industry proposal framework, a past research brought about the idea of gathering the Tourism Contextual Information (TCI) information to decide the significant data as the help of the travel industry suggestion framework. By adopting the global Extract Transform Load (ETL) measure, this examination intends to show how the supporting information including the data set construction, the information design, and the information portrayal in the travel industry suggestion framework are gathered. Tourism recommendation system requires some supporting tour data that have various formats originated from various sources [9]. This research aims to implement web tourism collaboration. This website is implemented for the purpose of disseminating information about tourism products and also to attract as many tourists as possible to visit tourism destinations through one information path. According to the results of the design carried out on the four websites, namely the tourism office website, hotels, travel agents and tourism as well as tourist destinations have been carried out according to the needs needed between each party [10].

III. PROBLEM STATEMENT

Tourism in India is important for the country's economy and is growing rapidly. The Travel and Tourism Competitiveness Report 2019 positioned India 34th out of 140 nations overall. India worked on its positioning by 6 puts over the 2017 report which was the best improvement among the top 25% of nations positioned. There are about thirty-eight World Heritage sites in India which are recognized by the United Nations Educational, Scientific and Cultural Organization as of August 2019. Computer generated Virtual reality (VR) innovation driven trials are changing the movement business. Taking this into account, Ministry of Tourism, Government of India has partnered with Outside VR , a travel tech startup, to empower people to travel India virtually and further boost Incredible India campaigns. Travelling with a racehorse mask causes no knowledge of the surroundings and the glory of that place. Lack of knowledge about travel spots become a common cause for the whitewash of many tourist places. Toughest travel spots can't be covered by everyone which causes a phobic impact on them. Also, there are many apps that are available in play store that provides assistance like route guide, suggest nearby places, hotels and restaurants but none of them include any information

regarding the place and the app can only be used by the people who can travel but not by the people who cannot travel. So, considering all this we have come up with an intelligent system that white mark all the travel spots in India, along with their historical and cultural importance of the place for a social cause to save the tourist spots. So, with an aim to increase tourism in India and provide easy traveling in India for the people across all over the world, our idea is to build an application that recommends all travel spots, provides cultural and historical importance of that place and suggests surroundings and glory of that travel spot by virtual guidance and provide the virtual visiting experience to the travel spots using highly defined technologies.

IV. SIGNIFICANCE AND RELEVANCE OF WORK

The application can be used by people across the world to have smooth tourism in India. Also, through this, people can get the cultural and historical importance of the place in just one touch. This app can also be used by the people who cannot travel, like senior citizens wherein they can see the places through the guide video option provided in the application. The application also helps people to visualize the places using augmented reality. People can also use this application to see nearby places, restaurants, and hotels. The main motive of the application is to increase tourism in India and hence help in increasing the revenue for the government. The proposed system can guide and monitor virtual tourism in real-time across India by providing accurate place suggestions and accurate weather data.

V. OBJECTIVES

This application almost covers most of the travel spots in India, along with the details like cultural, historical importance of the place. This application recommends shopping places, restaurants, hotels nearby while travelling for the places based on the conditions, the user provides. This application also estimates the distance between the two places, the user wants to travel based on the type of transportation the user selects. This application also includes guide videos for the place which support virtual tourism, including the location details. This application provides an opportunity for the tourist to post their experience of the place and will recommend for those people who search those places. This application also telecast few important events of the day.

VI. METHODOLOGY

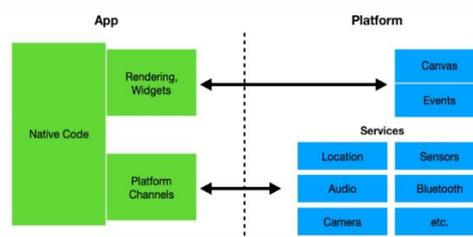


Figure 1: Rendering in Flutter

Flutter is a mobile application development framework designed for creating applications for both IOS and Android with a single code base. Flutter is a framework which was created and is being developed by Google company and the Flutter community. To evaluate both systems two Android prototype apps were developed. One app (App A) was developed using the native Android SDK, and the other (App B) using the Flutter SDK. App A and App B were identical in terms of functionality and user interface. The purpose of the apps was to evaluate the apps from the user perspective to determine if there was a difference in user satisfaction. The usability of a product is very important, especially for mobile apps because of the way they are delivered to customers. Mobile apps are published on the Apple App and Google Play Store. The success of the apps is strongly dependent on the reviews it gets by its users. Good usability in mind is therefore crucial for an app to achieve commercial success. The number of cross-platform technologies has seen strong growth in the last couple of years. The inspiration for utilizing these innovations is that they offer simpler and more expense proficient turn of events. They differ from traditional development technologies in that developers can implement their app once and execute it on multiple platforms. There are four main categories of apps created using cross-platform technologies: web, hybrid, interpreted and cross-compiled apps.

VII. SYSTEM ANALYSIS

We have many apps that are available in the Play-Store related to tourism. The apps like Red-Bus, Make-My-Trip are used to book a seat in the bus, flight, or railways to travel for the destined place. There are many agencies that are available which conducts a tour in packages and cover many places. There are many websites that give information regarding a particular place. There is a Google Maps available for the travel guide. There are blogs available on the internet where people can read about the place and the blogger experience. We have web applications that are available for state tourism.

7.1 Limitations

The main limitations of the existing system are, there is no application available which provides all the information like places, blogs, travel guide, user review, nearby places in one touch. People have to search for and everything to know about the place which is time-consuming. The existing system white masks some places. Foreigners face problems while traveling with the existing system. There is no support for virtual tourism.

7.2 Proposed System

The proposed system is an application named YASHODHARA whose main aim is to preserve the glory of Indian Tourism. The app is developed to access everything related to the place in one touch. The features of the app are: it contains most of the traveling spots in India. It gives detailed information regarding the place by specifying information, guide video, and also blog for the place. It also recommends the nearby places, restaurants, hotels, shopping places along with the route map and review of the place. It also provides a travel guide from the source to the destination place. The guide video can be viewed by the people who cannot travel and in turn, provides virtual tourism. It also includes the user review section so the people can view that for the traveling reference. It can be used by people across all over the world who want to travel to India.

7.2.1 Advantages

- The app can be used by people across the world to have smooth tourism in India. Also, through this, people can get the cultural and historical importance of the place in just one touch.
- This app can also be used by people who cannot travel, like senior citizens wherein they can see the places through the guide video option provided in the application.
- The users can also use this application to see nearby hotels, restaurants and places.
- The main motive of the application is to increase tourism in India and hence help in increasing the revenue for the government.
- The proposed system can guide and monitor virtual tourism in real-time across India by providing accurate place suggestions.
- People from different countries can use this app for easy reference.
- People can save their time by gathering more information in one search without searching for each and everything.

VIII. SYSTEM DESIGN

The project has mainly two modules,

8.1. Admin Module

The Admin Module is a Flutter Web Admin Panel which access statistical real-time data of users, places, blogs, featured contents, notifications, categories, etc. The admin has control over every content like places, blogs with real-time preview feature and can upload, edit and delete any number of blogs and places. The admin has pagination power who can do infinite scrolling to upload and view unlimited content. The admin can push notifications to the users like send offers to the users directly from the admin panel. The admin has control over the featured contents on the app and also control over the ads that are featured in the app when the user clicks. The admin can also delete the user comments.

8.2. User Module

User module is a Flutter app that has an animated splash screen. The app has a social media sign-in like Google Sign In, Facebook Sign In, Apple Sign In for iOS and also the user can skip Sign In where the user can access the without Sign Up option. The app has loading animations available on all the screens which give the users a fluent and smooth experience on data loading time. The app has a pagination feature that provides infinite scrolling and helps to load unlimited data without any problem and reduce database costs. The app also has pulled to refresh option. The app has custom google Maps and custom maker icons to make a new and elegant design. It has used 4 Google Map APIs - Google Map for Android, Google Map for iOS, Places API, and Direction API. This app provides the complete travel blog with users' reactions, comments, and bookmarks features. The app provides a Map View between source and destination place, estimated cost, the distance between two places, and step-by-step travel guides with cost. The app used Google Places API to show nearby hotels and restaurants on the google map applied an interactive animation between Google Map and Places list. The app also provides an option for the users to review places and comment on blogs and also delete their comments. The app used the Recent Search feature which will save the recent search(s) of users locally. The app has cached images and data where the images and database can be accessible even offline. The app contains interstitial ads of both Ad Mob and Facebook ads. The ads are configurable on user clicks and are controlled by the admin panel. The app provides multi-language support for the user. The user can edit their name and update their profile picture in the app.

The Hero Animation is used in the app which is a flutter animation package for a smooth and seamless user experience. For a backend service, we have used Cloud Firebase Database from Google, which is easy to use, fast and secure. We have used Firebase Analytics to access real-time activity of the users.

8.3. System Architecture

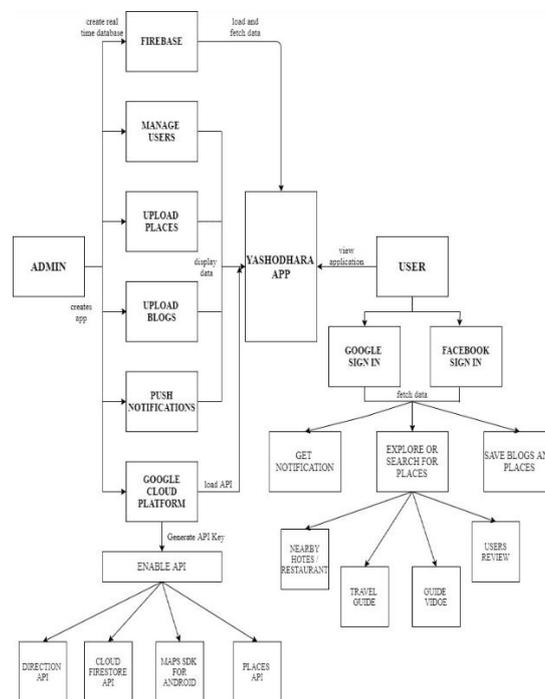


Figure 2: YASHODHARA Architecture

The tasks performed by the Admin are,

1. The Admin creates the Application.
2. The Admin the real time database in the Firebase to store the application data.
3. The Admin manages users of the application, add places, blogs to the application.
4. The Admin push the notifications in the flutter web application and that will be notified to users of the application. The push notifications can be either ads that are visible for the users or notifying a new places that has been added.
5. The Admin generates API key in the Google Cloud Key Platform in order to fetch that API's in the application.

The functionalities of the users are,

1. When the user install the application then he/she can either login with their google or Facebook account.
2. The user can view the data like places, notifications, blogs, Direction API, Place API which are fetched from the Firebase and GCP.

8.4 Data flow Diagram

8.4.1 Level 1: Dataflow between the users and Firebase.

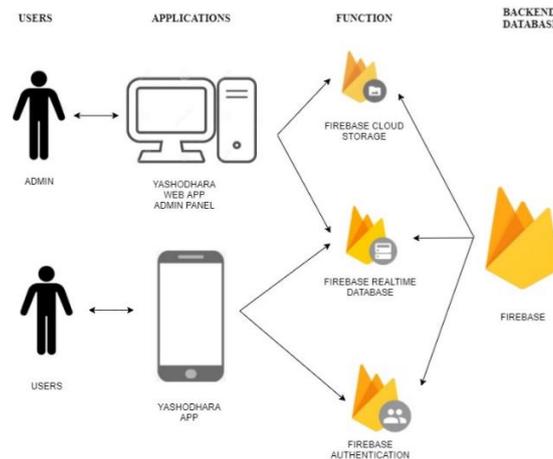


Figure 3: Dataflow between users and Firebase

Here, the users of our application are admin and application users. The admin accesses the Firebase Cloud Storage and Firebase Real-time Database through Flutter Web Application. The application users can view the contents in the application that can be fetched from the Firebase Real-time Database (Google Cloud) and the user authentication is performed through the Firebase Authentication.

8.4.2 Level 2: Data flow from the GCP to the Application.

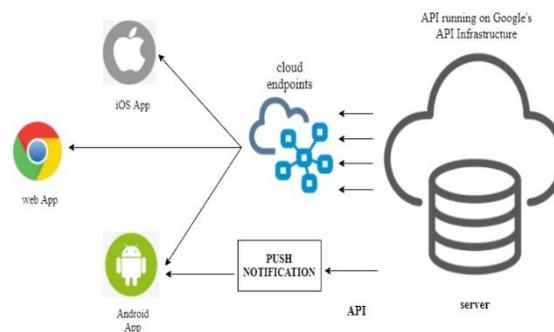


Figure 4: Dataflow from the GCP to the Application

The admin generates the API Key in the Google Cloud Platform in order to fetch the Direction API and the Places API. Once the user request for the Direction API or the Place API through their Android application or web application or iOS application then the API will be enables and it is loaded into the application through cloud endpoints.

IX. IMPLEMENTATION

9.1 Algorithm

The steps involved in developing an app are,

9.1.1. Admin Panel Setup:

Firstly, we have set up the database for the admin panel. We have used the **Fire-store database** as backend. The Firebase database rules setup can be done followed by Firebase setup as follows, Go to your Firebase console > project overview > database > cloud Fire-store > rules and then edit the rules and click publish. After this Firebase index setup for the admin panel is done. Followed by Push notification setup to notify the users. Run the admin app. Upload the admin app to the Firebase hosting. Fix bugs if occurred.

9.1.2. User Module Setup

- Project Setup.
- Firebase setup for Android:
 - Google Sign In Setup
 - Facebook Sign In Setup
- Firebase setup for iOS:
 - Facebook Sign In for iOS
 - Sign In with Apple
- Google Map Setup:
 - Google Map Android Setup
 - Google Map iOS Setup
- Multi-language Setup
- Ads Setup:
 - Ad mob setup
 - Facebook Ads setup
- Other setup involves privacy policy, splash icon, latitude and longitude.
- Run the App
- Fix bugs
- Release the Android app in Google Play store
- Release the iOS app in Apple store.

X. PERFORMANCE ANALYSIS

The performance of the application is measured on the following categories,

10.1. Device Performance.

For device performance, following parameters are considered,

App Start-Up: When the user clicks on the app icon the first screen will be loaded in 1 or 2 seconds.

Battery Time while using an app: On constant use the mobile app consumes a less amount of battery life and the phone will not get heated up ever after using for long time.

Memory Consumption: The app consumes the memory in moderate level since it includes push notifications. The memory usage by whole O.S is 11%.

Usage with Other Apps: When the app is running in parallel with other apps, then there is no interference observed.

App in background: When the app that is running in the background is retrieved, it is remained in the same state as it was before.

Network Speed: The app is checked on a variety of networks with variable speed. The app is tested on 3G, and 4G networks. Both the mobile networks and Wifi networks are included in this. Also, the behaviour of app is monitored. Especially, when both networks are available, and switching occurred from one network to another and there is no issue faced in an app by the users while switching phone network from 4G to WIFI and vice versa.

The other parameters of the app are,

- Dart is by default executes all its code on a single-threaded.
- Lowering the frame render time below 16ms might not make a visual difference, but improves battery life and thermal issues.
- When 120fps devices become widely available, we want to render frames in under 8ms (total) in order to provide the smoothest experience.
- Every function and every async-await calls work only on the main thread (until and unless specified).
- We have used state management frameworks such as provider to implement local refresh.
- We have used some Curves Curve animation (fast then slow). Since we have used some Curves Curve, the visual will be faster than the linear animation.

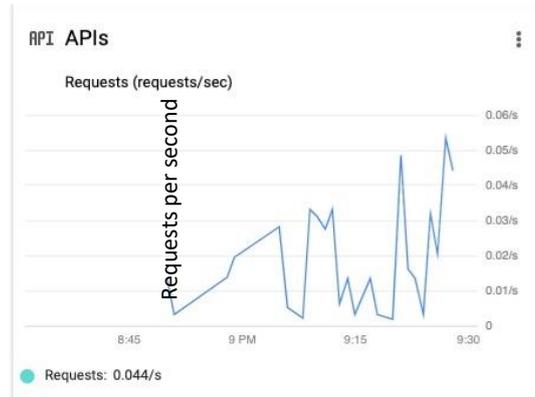


Figure 5: API Request Graph

The above figure depicts the response time of each request that are made to the API. The average response time is 0.044/s.

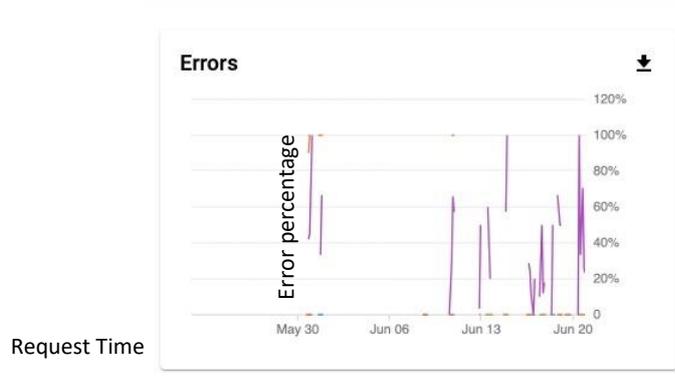


Figure 6: Erroneous Requests to API Graph

The figure depicts the erroneous request made to the API. For example, when request is made without network connection.

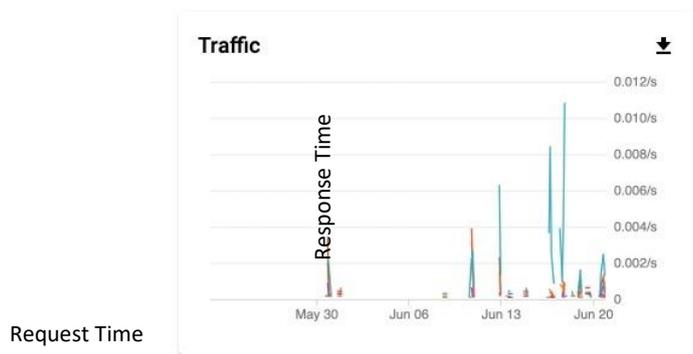


Figure 7: Traffic of the App Graph

This figure describes the usage of the app by the end users and their response time.

XI. CONCLUSION

We have briefly explained on how the work upholds the glory of Indian Tourism by providing travel guide, recommending nearby hotels, restaurants, blogs, detailed information and user reviews about the place. This will features the white masked places also and an idea of virtual tourism is also introduced by including guide video which can be viewed by the people who cannot travel. All these are achieved by developing a flutter app with Firebase and Google Cloud Platform.

In Future we can also include below features in the app, The present app support multiple languages like English, Spanish etc, so in future one can create an API to support the regional languages like Hindi, Kannada etc.. of the places. To fetch a Weather API Key from Google Cloud Platform to give real-time weather updates of the place. To feature the live events.

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