CHAPTER 1

INTRODUCTION

Car parking has become a serious issue in today's congested areas due to a lack of parking facilities. In most metropolitan places, finding a parking spot is extremely tough and irritating, especially during rush hour. In order to resolve these issues the proposed application makes it simple to reserve a parking space. This programme allows users to view various parking spots as well as determine whether or not there is available space. If the booking space is available, he can reserve it for a certain time frame. Additionally, this system provides users with additional functions. The effective management of available parking spaces is demonstrated, and the system might be expanded to conceal additional regions and venues. In the 12 months of 2012, 159 million new car registrations were announced, but in the 12 months of 2002, there were at least 58 million new car registrations, predicting a 100% boom in 10 years. Cannot be (Statistical Yearbook India, 2016). Based on the above information provided by the Ministry of Road Transport and Highways in India, today's transportation infrastructure and vehicle parking are considered insufficient to maintain the flow of vehicles on the road. Therefore, problems such as congestion of visitors and lack of parking space are inevitable. The biggest problem highlighted is the difficulty of parking, as the unnamed boom of visitors to India brought pollutants and terrible roads. There are types of parking lots, including off-road parking lots and on-road parking lots. One of the most popular lifestyles is called off-road parking found in large malls, theatres, and large offices. Off-road parking parks the car more systematically to get the most out of the parking lot, while on-road parking parks the car on the street in a disorganized or chaotic way. The misuse of the land will be severe. Satisfactory urban navigation and increasing social and environmental costs. This paper focuses on the problems customers face when trying to find an area at the same time as a parked car and shows the difference in the GUI. Nowadays parking problem is faced thanks to parking lot falling in need of the present requirements within the country because the total number of vehicles exceeds the entire number of heads per family. In Indian cities, the parked cars claim tons of space which results in congestion and traffic problems. Thus, fundamentally parking may be a problem of space. With the population over our country there increases the transportation in cities, the demand for parking spaces is additionally increased. this is often especially because the infrastructural growth of our cities is unable to stay up with the development and non-

availability for spaces to park the opposite aspects of urban life have begun to spill over in sort of congestion, fuel loss, dispersed land use and low air quality thanks to the scarcity in parking spaces. It is, therefore, strongly desired to supply an efficient strategy to deal with these concerns there are several ways of managing the parking problem. One approach is by increasing the parking lot but this may cause huge investment. However, the good managing will be a wise method for the existing parking spaces. The Internet is widely used over the globe.by making use of the internet, the people can manage the parking system. In this proposed system we can access and book the parking slot where ever it is available in the mobile phone and it is user-friendly, the overall system design consists of the following modules which provide a complete solution for the problems faced due to parking and searching for the availability faced by the users.

CHAPTER 2

LITERATURE REVIEW

1. **Reservation Based Parking System with Dynamic Slot Allocation [HinaKousar, Kavitha Kumar, Shoney Sebastian], 2019**

The objective of this paper is to highlight the implementation of dynamic memory allocation using arrays and how it is better than other methods. It is often observed that parking vehicles manually takes longer time wherein user searches the parking area and parks the vehicle which is a tedious task, to save the time spent for searching the slot a registration based application circle parking system is designed which provides platform to users to book parking spaces online in advance for a given location and then park the vehicle with a minimal fees. This application allocates slots dynamically using array and stores the booking details. This paper discusses the benefits of the dynamic allocation in circle parking system. Parking of vehicles in existing scenario is getting difficult as number of vehicles keeps on increasing whereas the parking area remains the same. As a result, people would spend a certain amount of time looking for parking space and thus cause a situation where the traffic would be slowed down and cause congestion. The situation of looking for parking space and traffic congestion in parking areas is due to the fact that the information of available parking spaces is not readily available to the people looking for parking spaces. As such different approaches have been used to develop a car park management system such as wireless sensor network system and a vision system. This paper highlights the difficulties faced by the customers searching for spaces while parking vehicles, shows difference between manual and automated parking system, outlines circle parking system architecture and how the dynamic slot allocation is done in it and the devices required to implement it.

2. **An Android Application for Parking Management and Dissemination System [ShindeSmita N., ShindeKomal V., NagpureRashmila D. , Tupkar Avanti S., Prof.Ankoshe M. S.], 2019**

Parking is a problem for almost everyone today so there has to be a solution, which helps getting rid of problems arising due to the lack of a proper parking management system. Although various traditional PGIS (Parking Guidance Information System) exist, they can serve only a few users because it is difficult for such static systems to disseminate information on a wider scale. So the aim of this study is to provide a dynamic solution by introducing the concept of parking guidance system over the internet and also using one of the latest techniques available today i.e. the QR code for the user's ease. The system is basically designed for a college parking which can further be extended as required. This system enhances the components of existing parking system available in the colleges. This system runs on a mobile phone platform and provides a visual display of parking lots available to the user so that the user can book or reserve a space. Six parking spaces were gathered within Sanjivani College of Engineering, Kopargaon and were published on the web map server. The Quick Response QR code is affixed at every parking space. The user can thus select the parking space from the visual display. The user needs to scan the QR Code while parking and unparking the vehicle. The action of the user is then reflected in the database. The android application was thus developed that can incur the parking information which was uploaded on the web map server. This system reduces the time which is involved in searching the parking space thus reducing the fuel consumption, user's frustration. It reduces vehicle travel time and parking time. Use of automobiles is increasing day by day which leads to various parking issues. Vehicular population is shooting out the roof, no amount of space is sufficient to accommodate stationary vehicles. Management of parking has grown to large extent. The main problem is to manage parking in congested areas.

3. **Design and Implementation of Smart Parking System Based on Raspberry Pi Advanced Microcontroller System [Prasanth, M., K. S. Roshini, T. Pujitha, C. Sai Thanusha, C. Sai Mahesh, M. Purushotham Rao, and P. Rajesh], 2020**

The internet of things plays a vital role in interconnection and automation of various physical devices, vehicles, home appliances and other things. With the help of software, various sensors, actuators, these objects connect and exchange data. This automation of devices enhances a person's standard of life and way of living, which is a need of future. A similar need is discussed in this project. In this project a smart parking feature is discussed which enables a user of find a parking location and a free slot in that parking space inside a city. This project focuses on reducing time wasted on finding parking space nearby and ongoing through the filled parking slots. This in turn reduces the fuel consumption and standard of living. With the exponential increase in the number of vehicles and world population day by day, vehicle availability and usage on the road in recent years, finding a space for parking the car is becoming more and more difficult with resulting in the number of conflicts such as traffic problems. This is about creating a reliable system that takes over the task of identifying free slots in a parking area and keeping the record of vehicles parked very systematic manner. The proposed system reduces human effort at the parking area to a great extent such as in case of searching of free slots by the driver and calculating the payment for each vehicle using parking area. The various steps involved in this operation are vehicle identification using RFID tags; free slot detection using IR sensors and payment calculation is done on the basis of period of parking. Variety of occasions turn up when we visit various public places like Shopping malls, 5- star and 7-star hotels, multiplex cinema halls, etc. The difficulty we encounter at these places is finding the availability of parking space. Most of the times we need to traverse through multiple parking slots to find a free space for parking. The problem becomes more tedious if the parking is multi-stored. Thus, the problem is time-consuming. This situation calls for the need for an automated parking system that not only regulates parking in a given area but also keeps the manual intervention to a minimum. Our proposed system presents an Autonomous car parking that regulates the number of cars that can be parked in a given space at any given time based on the parking space availability.

4. **Automated Vehicle Parking Slot Detection System Using Deep Learning [Bandi Sairam, Aditi Agrawal, Gopi Krishna, Dr. Satya Prakash Sahu], 2018**

The Drivers especially folks that can also additionally want to get the parking areas can also additionally locate it not possible to access it on the grounds that there can be different automobiles blockading the manner and but they need to hurry to e-book for parking areas. This is due to the use of paper-primarily based totally that is unsecure and desires self-touch to reserve for parking and it`s additional time consuming, to layout online automobile parking reservation the gadget will offer higher performance in finding parking area and purchasing it. Traffic congestion at the parking slots is a major problem that the modern society is facing nowadays, as the vehicle numbers are increasing at a rapid pace without the increment of the parking slots. The research done here helps solve the traffic congestion problem at the bottleneck of the networks mainly at the parking slots, by Instance Segmentation algorithms and Deep Learning. The model gets all the initial available parking slots that are available in the given area and real time processing is done on the obtained data to find whether the slots are empty or occupied with any vehicle and gives the information of empty slots. Apart from locating a free parking space for a car, the model also finds out appropriate parking space for two wheelers (less space occupant vehicles). The proposed system shows improved robustness achieving a mask rate of recognition greater than 92.33% and a boundary recognition rate of 98.4%.

5. **Design and Fabrication of an Automated Multi-level Car Parking System. [Albagul, Abdulgani & Alsharef, K & Saad, Mustafa & Abujeela, Y], 2013**

The basic multi-level car parking system with three floors is considered to show the use of control systems in parking systems. The control system will play a major role in organizing the entry to and exit from the parking lots. It also presents the design of multi-level parking lots which occupies less need on the ground and contains the large number of cars. In the modern world, where parking-space has become a very big problem, it has become very important to avoid the wastage of space in modern big Automatic multi-level car parking system helps to minimize the car parking area companies and apartments. The parking lots have an elevator to carry cars to different

floors according to the vacancies. The elevator is controlled by a programmable logic controller (PLC) along with the help of some sensors. The advancement and progress of nations is measured by the possibility of their use and application of latest invented technologies in all aspects of life. Control engineering is one of the aspects which have been given a great deal by many researchers. It became to a great concerns in many areas such as industry, agriculture, medicine, education and infrastructure. Automatic control systems have emerged as an integrated part in telecommunications, electricity, fuel and other applications. This paper is devoted to the use of control systems in parking systems. The control system will play a major role in organizing the entry to and exit from the parking lots. It also presents the design of multi-level parking lots which occupies less need on the ground and contains the large number of cars. Therefore, the need of using technologies became inevitable. In the modern world, where parking-space has become a very big problem, it has become very important to avoid the wastage of space in modern big Automatic multilevel car parking system helps to minimize the car parking area companies and apartments etc. There are two types of car parking systems: traditional and automated. In the long term, automated car parking systems are likely to be more cost effective when compared to traditional parking garages. Automatic multi-storey automated car park systems are less expensive per parking slot, since they tend to require less building volume and less ground area than a conventional facility with the same capacity. Both automated car parking systems and automated parking garage systems reduce pollution.

6. **Automated Parking Space Detection Using Convolutional Neural Networks. [Julien Nyambal, Richard Klein]2021**

   Finding a parking space nowadays becomes an issue that is not to be neglected, it consumes time and energy. We have used computer vision techniques to infer the state of the parking lot given the data collected from the University of The Witwatersrand. This paper presents an approach for a real-time parking space classification based on Convolutional Neural Networks (CNN) using Caffe and NVidia Digits framework. The training process has been done using Digits and the output is a caffemodel used for predictions to detect vacant and occupied parking spots. The system checks a defined area whether a parking spot (bounding boxes defined at initialization of the system) is containing a car or not (occupied or vacant). Those bounding box coordinates are saved

from a frame of the video of the parking lot in a JSON format, to be later used by the system for sequential prediction on each parking spot. The system has been trained using the LeNet network with the Nesterov Accelerated Gradient as solver and the AlexNet network with the Stochastic Gradient Descent as solver. We were able to get an accuracy on the validation set of 99% for both networks. The accuracy on a foreign dataset (PKLot) returned as well 99%. Those are experimental results based on the training set shows how robust the system can be when the prediction has to take place in a different parking space. As the population grows, the number of private vehicles increases as well. But the number of parking spaces most of the time remains. Sometimes, and most of the time, there are vacant spots, but the drivers do not have any information about them. It could be, either the free spot is far from them, or it is hidden by some other cars or any other objects big enough to hide the spot. In the past, and maybe at some places now, parking spaces are managed by some persons in the parking lot who might not have the total view of the next available parking space. Sometimes the driver him/herself has to check for a vacant space by circling in the parking lot, and another driver will come and many losses are generated: time, fuel, and maybe temper. Some researchers came up with different parking space detection algorithms using gadgets like video cameras or sensors to detect a vacant spot when needed. Those algorithms combined gave birth to automated parking detection. The target of the system is mostly open areas like shopping mall parking lots or university parking lots. Implementing a sensor-based approach to automating the parking spot detection will require paperwork, time will be wasted and more trouble to the users when trying to park their vehicles while installing those devices on the ground. On the other hand, those parking lots are monitored by video cameras for security purposes, which is the case in most shopping malls as well. Video-based detection for detection is being used in many areas like obstacle detection, human detection. Convolutional Neural Networks architecture (CNN) is similar to the human neural network build with synapses (weights) and neurons. From this point of view, complex tasks can be learned through the network. This uses CNN with pre-existing architectures to detect in real-time the vacancy of a parking spot.

CHAPTER 3

EXISTING SYSTEM

Currently, there are fewer flutter applications that work with Android and IOS. In the existing system one of the main issue faced by the user is the location problem for the parking and also it does not mention the parking places for the user. Also, in the current system, it does not show the time limit for parking. Among the challenges that we face in our day to day life one of most unavoidable challenge is parking the car wherever we go. As our need increases our travelling increases but due to drastic increase in usage of vehicles and increase in population we face the tough task of parking our car particularly during busiest hours of the day. During peak hours most of the reserved parking area gets full and this leaves the user to search for their parking among other parking area which creates more traffic and leaves them with no indication on availability of parking space. To overcome this problem there is definitely a need for designed parking in commercial environment. To design such parking slot we need to take into the account of reservation of parking slot with optimal parking space which depends on cost and time. Additionally, four hours prior to his expected arrival, the user can pre-book a slot in the area he desires if it is available. This will help reduce the load on the administrator as his physical work reduces drastically and user can search the parking slot through Android Application. Payment services are made available using Google Wallet, so the user is required to own a credit card or debit card. Application relieves the user from the hassle of manually searching and waiting for empty slots to park the vehicle. The user needs to install the application on his android based device. After installation, the icon of the app will feature on the home screen of the user's device. Welcome screen will be flashed to the user on opening the application. The proposed system is the combination of smart parking and the Slot allocation with the Android application. In the existing system, a dynamic algorithm is carried out, which is a random allocation method. It randomly allocates parking lot to the users.

CHAPTER 4

PROPOSED SYSTEM

The proposed application makes it simple to reserve a parking space. This programme allows users to view various parking spots as well as determine whether or not there is available space. If the booking space is available, user can reserve it for a certain time frame. The effective management of available parking spaces is demonstrated, and the system might be expanded to conceal additional regions and venues. Here we can access and book the parking slot where ever it is available in the mobile phone and it is user-friendly. The overall system design consists of the following modules which provide a complete solution for the problems faced due to parking and searching for the availability faced by the users. In most metropolitan places, finding a parking spot is extremely tough and irritating, especially during rush hour. In order to resolve these issues the proposed application makes it simple to reserve a parking space. This programme allows users to view various parking spots as well as determine whether or not there is available space. If the booking space is available, he can reserve it for a certain time frame. Additionally, this system provides users with additional functions. The effective management of available parking spaces is demonstrated, and the system might be expanded to conceal additional regions and venues. Nowadays parking problem is faced thanks to parking lot falling in need of the present requirements within the country because the total number of vehicles exceeds the entire number of heads per family. In Indian cities, the parked cars claim tons of space which results in congestion and traffic problems. Thus, fundamentally parking may be a problem of space. With the population over our country there increases the transportation in cities, the demand for parking spaces is additionally increased. this is often especially because the infrastructural growth of our cities is unable to stay up with the development and non-availability for spaces to park the opposite aspects of urban life have begun to spill over in sort of congestion, fuel loss, dispersed land use and low air quality thanks to the scarcity in parking spaces. It is, therefore, strongly desired to supply an efficient strategy to deal with these concerns there are several ways of managing the parking problem. One approach is by increasing the parking lot but this may cause huge investment. However, the good managing will be a wise method for the existing parking

spaces. The Internet is widely used over the globe.by making use of the internet, the people can manage the parking system. In this proposed system we can access and book the parking slot where ever it is available in the mobile phone and it is user-friendly, the overall system design consists of the following modules which provide a complete solution for the problems faced due to parking and searching for the availability faced by the users.

The proposed system is mainly having the following modules:

- Sign-in Page Module:

  This is the Sign-in page where we can login with Mobile Number and get OTP verification. Here admin and user Sign-in through same page.

- Finding Parking Slot Module:

  In this Find Parking Slot and the users can see their nearby parking slot and their location using Google API

- Profile Page Module:

  This is profile page where the details of the users and the booking details can be viewed and edited.

- Admin-Verification Module:

  This page is used for Admin to check the parking slot status of the users so that admin can verify.

CHAPTER 5

IMPLEMENTATION

Car parking has become a serious issue in today's congested areas due to a lack of parking facilities. In most metropolitan places, finding a parking spot is extremely tough and irritating, especially during rush hour. The parked cars claim tons of space which results in congestion and traffic problems. Thus, fundamentally parking may be a problem of space. With the population over our country there increases the transportation in cities, the demand for parking spaces is additionally increased. this is often especially because the infrastructural growth of our cities is unable to stay up with the development and non-availability for spaces to park the opposite aspects of urban life have begun to spill over in sort of congestion, fuel loss, dispersed land use and low air quality thanks to the scarcity in parking spaces. It is, therefore, strongly desired to supply an efficient strategy to deal with these concerns there are several ways of managing the parking problem. One approach is by increasing the parking lot but this may cause huge investment. Unlike a traditional SQL database, which stores data in columns and rows in a table using SQL. Each data that is stored in documents and collections format is stored in Cloud Fire store, which is NoSQL. Every document has a collection of key-value pairs that can be used to retrieve information. Cloud Fire store is designed to hold big groups of tiny documents. The data in the documents is comparable to JSON, however it is limited to 1MB in size. To install flutter plugin to the android studio. At the bottom setting, click configure then choose plugins. At the top search bar, search for flutter and choose install. First, fill in all of the necessary parameters, such as the device's permissions, the recommended installation directory, a suitable theme name, screen resolution, and screen orientation. Second, double-check the flutter dart file in the side window. To look for errors, enable debugging mode if necessary. To start the debugging process, press the play button. Third, ensure that the debugging mode on the user's device is turned on; otherwise, the developer will be unable to access the device. Use the appropriate cable to connect the gadget to the computer. Here we had built an mobile application for car parking using flutter , flutter is a base to design an application were the Functions of the modules are written using flutter based Dart language, Backend-as-a-Service (BaaS) app development platform Firebase offers hosted backend features such a real-time database, cloud storage, authentication, crash reporting, machine

learning, remote setup, and static file hosting. The Internet is widely used over the globe.by making use of the internet, the people can manage the parking system. In this proposed system we can access and book the parking slot where ever it is available in the mobile phone and it is user-friendly, the overall system design consists of the following modules which provide a complete solution for the problems faced due to parking and searching for the availability faced by the users.

5.1 SYSTEM ARCHITECTURE

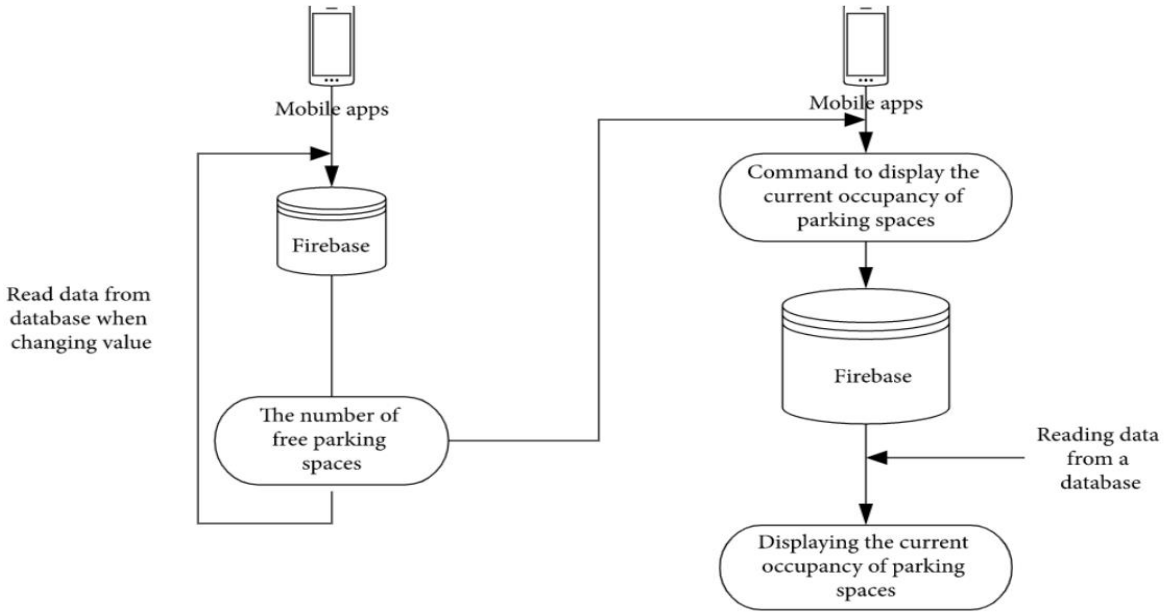

FIG 5.1 SYSTEM ARCHITECTURE

Unlike a traditional SQL database, which stores data in columns and rows in a table using SQL. Each data that is stored in documents and collections format is stored in Cloud Fire store, which is NoSQL. Every document has a collection of key-value pairs that can be used to retrieve information. Cloud Fire store is designed to hold big groups of tiny documents. The data in the documents is comparable to JSON, however it is limited to 1MB in size. To install flutter plugin to the android studio. At the bottom setting, click configure then choose plugins. At the top

search bar, search for flutter and choose install. First, fill in all of the necessary parameters, such as the device's permissions, the recommended installation directory, a suitable theme name, screen resolution, and screen orientation. Second, double-check the flutter dart file in the side window. To look for errors, enable debugging mode if necessary. To start the debugging process, press the play button. Third, ensure that the debugging mode on the user's device is turned on; otherwise, the developer will be unable to access the device. Use the appropriate cable to connect the gadget to the computer. Here we had built an mobile application for car parking using flutter , flutter is a base to design an application were the Functions of the modules are written using flutter based Dart language, Backend-as-a-Service (BaaS) app development platform Firebase offers hosted backend features such a real-time database, cloud storage, authentication, crash reporting, machine learning, remote setup, and static file hosting.

CHAPTER 6

FLUTTER

Flutter is an open-source UI software development kit created by Google. It is used to develop cross platform applications for Android, iOS, Linux, macOS, Windows, Google Fuchsia and the web from a single codebase. The first version of Flutter was known as "Sky" and ran on the Android operating system. It was unveiled at the 2015 Dart developer summit[7] with the stated intent of being able to render consistently at 120 frames per second.[8] During the keynote of Google Developer Days in Shanghai in September 2018, Google announced Flutter Release Preview 2, the last major release before Flutter 1.0. On December 4th of that year, Flutter 1.0 was released at the Flutter Live event, denoting the first stable version of the framework. On December 11, 2019, Flutter 1.12 was released at the Flutter Interactive event. On May 6, 2020, the Dart software development kit (SDK) version 2.8 and Flutter 1.17.0 were released, adding support for the Metal API which improves performance on iOS devices by approximately 50%, as well as new Material widgets and network tracking development tools.

6.1 FLUTTER ARCHITECTURE

Flutter is designed as an extensible, layered system. It exists as a series of independent libraries that each depend on the underlying layer. No layer has privileged access to the layer below, and every part of the framework level is designed to be optional and replaceable. o the underlying operating system, Flutter applications are packaged in the same way as any other native application. A platform-specific embedder provides an entry point; coordinates with the underlying operating system for access to services like rendering surfaces, accessibility, and input; and manages the message event loop. The embedder is written in a language that is appropriate for the platform: currently Java and C++ for Android, Objective-C/Objective-C++ for iOS and macOS, and C++ for Windows and Linux. Using the embedder, Flutter code can be integrated into an existing application as a module, or the code may be the entire content of the application. Flutter includes a number of embedders for common target platforms, but other embedders also exist. The flutter architecture consist of Flutter Engine, Foundation Library and Widgets.

6.2 FLUTTER ENGINE

It's a portable runtime for high-quality mobile applications. It's built using the C++ programming language. The flutter core libraries, which contain graphics and animation, network input output and file, plugin architecture, accessibility support, and a dart runtime, are used to create flutter applications. Skia, an open source Google graphics library, can be used to render low-level images. The Flutter Engine is a portable runtime for high-quality mobile applications. It implements Flutter's core libraries, including animation and graphics, file and network I/O, accessibility support, plugin architecture, and a Dart runtime and toolchain for developing, compiling, and running Flutter applications. Flutter's engine takes core technologies, Skia, a 2D graphics rendering library, and Dart, a VM for a garbage-collected object-oriented language, and hosts them in a shell. Different platforms have different shells, for example we have shells for Android and iOS. We also have an embedder API which allows Flutter's engine to be used as a library (see Custom Flutter Engine Embedders). The shells implement platform-specific code such as communicating with IMEs (on-screen keyboards) and the system's application lifecycle events. The Dart VM implements the normal Dart core libraries, plus an additional library called dart: ui to provide low-level access to Skia features and the shell. The shells can also communicate directly to Dart code via Platform Channels which bypass the engine.

6.3 FOUNDATION LIBRARY

Packages are the building blocks for developing a flutter application, and they are located in the foundation library. Dart is the programming language that these libraries are written in.

6.4 WIDGETS

The widgets are the foundation of the Flutter framework. Everything is a widget, I flutter. Widgets are essentially user interface components that are utilised to form the application's user interface. In flutter, the application is a widget. The programme is the top-level widget, and its user interface is created by one or more children (widgets), which are then created by their offspring widgets. This virtue of composability aids us in creating user interfaces of any complexity. The widget hierarchy of the hello world application (built in the previous chapter) is shown in the diagram below.

CHAPTER 7

FLUTTER PACKAGE

A package is a namespace that contains a collection of identical classes, interfaces, and sub-packages. Packages are similar to the various folders on our computers, where we might have movies in one, photos in another, software in still another, and so on. Dart uses Flutter packages to organize and distribute a bundle of functionality. Shared packages, which are offered to the Flutter and Dart ecosystem by other developers, are always supported by Flutter. We can construct the app without having to start from scratch thanks to the packages.

Different Types of Packages We can divide the package into two types based on its functionality:

7.1 DART PACKAGE

A dart package, such as a path package, is a general package built in the dart programming language. This package works in any setting, whether it's a web or mobile platform. It also has a dependent on the Flutter framework, such as the fluro package, because it provides some Flutter-specific features.

7.2 PLUGIN PACKAGE

This is a specific Dart package that includes a Dart-based API and is built on the Flutter framework. It can be used in conjunction with a platform-specific implementation for underlying platforms like Android (using Java or Kotlin) and iOS (using Objective C or Swift).

CHAPTER 8

DART

Dart is a programming language designed for client development, such as for the web and mobile apps. It is developed by Google and can also be used to build server and desktop applications. Type inference is a feature of Dart, a variable data type does not need to be defined explicitly because Dart will "infer" what it is. In Java, a variable's type must be specified explicitly at declaration. String anything, for example. In Dart, however, the keyword is used instead, as in var something. The code treats the variable as a number, string, bool, or object, depending on what it contains. All data types, including numbers, are objects. As a result, if left uninitialized, their default value is null rather than 0. The return type of a method isn't required in the method signature. The type num declares any numeric element, including real and integer. The super () method is only called at the end of a subclass's Object () function [native code]. It is optional to use the term new before the function Object () [native code] to create an object. In the method signature, a default value for the provided parameters might be specified. As a result, default values are utilized if one is not supplied in the method call. Runes is a new built-in data type for UTF-32 code points in a string. Emoji's and other related icons serve as a nice example. Dart also comes with pre-installed libraries, the most popular of which are: Dart: core is used to provide core functionality and is included in all dart files. For asynchronous programming, use dart: async. For mathematical functions and constants, use dart: math. For converting between multiple data representations, such as JSON to UTF-8, use dart: convert. It is an object-oriented, class-based, garbage-collected language with C-style syntax. It can compile to either native code or JavaScript, and supports interfaces, mixins, abstract classes, reified generics and type inference. Dart is another product by Google and released version 2.1, before Flutter, in November. As it is starting out, the Flutter community is not as extensive as React Native, Ionic, or Xamarin. A while back, I discovered a liking for JavaScript. Google had its first ever release of Flutter 1.0 last December, after having it in beta mode for over 18 months. Dart is the programming language used to code Flutter apps. Dart is another product by Google and released version 2.1, before Flutter, in November. As it is starting out, the Flutter community is not as extensive as React Native, Ionic, or Xamarin. A while back, I discovered a liking for JavaScript. I was ecstatic to be working on a React Native mobile app for my internship. I enjoy coding hybrid

mobile apps too, so wanted to give flutter a try, as I had done Xamarin sometime last year. At my first glance of Flutter (and Dart), I felt befuddled and couldn't seem to understand anything. They even had a section on their docs for developers moving from React Native. So, I took to digging deeper on all things Dart. Dart looks a bit like C and is an object-oriented programming language. So, if you prefer the C languages or Java, Dart is the one for you, and you'll likely be proficient in it. Dart is not only used for mobile app development but is a programming language. Approved as a standard by Ecma (ECMA-408), it's used to build just about anything on the web, servers, and desktop and of course, mobile applications (Yes, the same people who standardized our favourites ES5 and ES6.) Dart, when used in web applications, is transpiled to JavaScript so it runs on all web browsers. The Dart installation comes with a VM as well to run the .dart files from a command-line interface. The Dart files used in Flutter apps are compiled and packaged into a binary file (.apk or .ipa) and uploaded to app stores.

8.1 GOOGLE FIREBASE

The Firebase Real-time Database is a database that is hosted in the cloud. It supports JSON-based data storage and data synchronization with connected clients in real time. During cross-platform application development procedures employing iOS, JavaScript, and Android SDKs, single instances of the Real-time Database serve as clients. It enables programmes to receive the most recent data and updates. Because the Database SDK performs on-disk data persistence, offline applications can stay responsive. It aids in the synchronization of devices to current server states after connectivity is restored.

CHAPTER 9

METHODS

9.1 SIGN-IN PAGE

This is the Sign-in page where we can login with Mobile Number and get OTP verification. Here admin and user Sign-in through same page.

FIG 9.1.1 SIGN-IN PAGE

9.2 FINDING PARKING SLOT

In this Find Parking Slot as the users can see their nearby parking slot and their location using Google API.

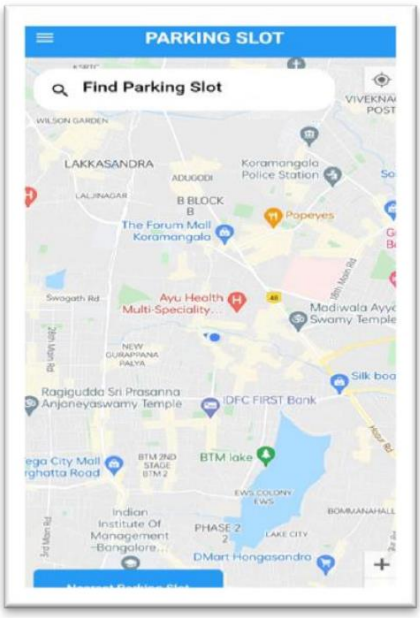

FIG 9.1.2 FINDING PARKING SLOT

9.3 PROFILE PAGE

This is profile page where the details of the users and the booking details can be viewed and edited.

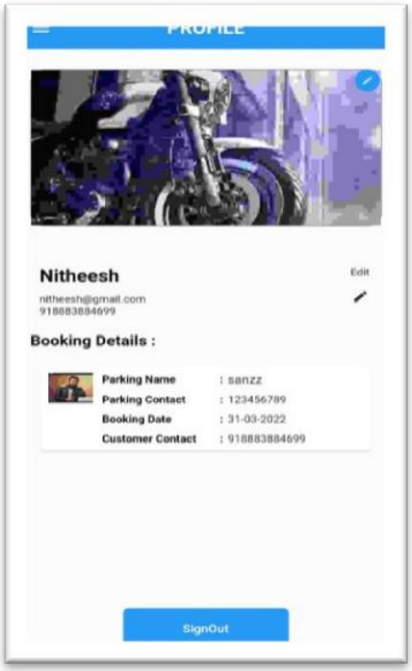

FIG 9.1.3 PROFILE PAGE

9.4 ADMIN-VERIFICATION PAGE

This page is used for Admin to check the parking slot status of the users so that admin can verify.

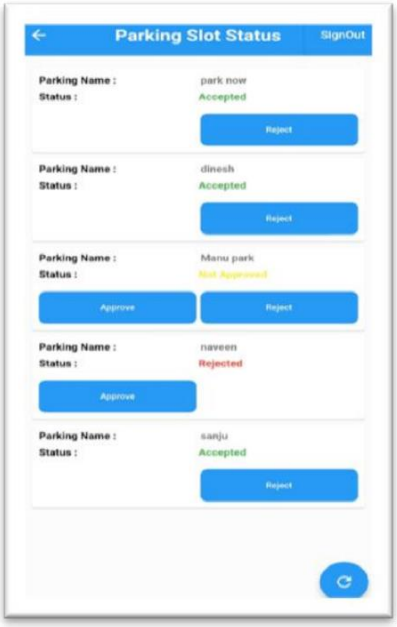

FIG 9.1.4 ADMIN-VERIFICATION PAGE

CHAPTER 10

FUTURE ENHANCEMENT

- Single codebase for every platform.

Flutter is a single codebase development framework. The application that you make on Flutter can be published on Android, iOS, desktop, and web. For a business looking to enter the digital space in minimal effort and time, Flutter cross platform app development can be a great starting point.

- Completely customizable widgets.

One of the best thing about Flutter is the fact that it supports platform centric widgets. The two set of Flutter widgets – Cupertino and Material Design – enable Flutter mobile app development companies to design platform specific UI/UX, giving users an experience which is closest to native. A sign of how updated and active the framework is in the widget department can be seen in the recent 1.22 version launch, where it extended support to iOS 14 and Android 11.

- Faster application development

The next best thing about the framework is its capability to expedite the development and testing process. The fact that it is a single codebase framework added to the hot reload facility makes it easy for developers to build an app while testing it in real-time. This, in turn, plays a crucial role in lowering the mobile app development cost as well.

CHAPTER 11

CONCLUSION

As we developed this application in Flutter because Flutter is currently one of the most exciting mobile technologies available. Flutter is the quickest framework for creating cross-platform mobile apps. Flutter has a bright future ahead of it, with a lot of possibilities for developers. Flutter has grown into a formidable framework that can no longer be overlooked. Flutter is the greatest solution for businesses wishing to design apps for both iOS and Android. Flutter is a helpful toolkit that makes developing new applications simple. It's the finest solution for creating apps with a great user interface and strong performance. In terms of speed of implementation, it is a 100 percent promising framework. The proposed gadget lessen power frustration and site visitors via way of means of offering nearest parking region and to be had slot. As clever parking gadget growth the provider ranges in operation, there is lots of scope for improvements and implementation thru facts standardization and management, cellular smartphone integration, hardware and software program integration .So we've got give you an answer that we will construct an android and IOS utility for the customers which include monitoring of parking region, looking for slot and reserving of slot earlier the person reaches the destination. So, this utility may be person-pleasant for the customers so altogether it resolves issues like site visitors' congestion, seek of slots and to find nearby parking slot.

CHAPTER 12

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