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FIREBASE ENABLED SMART PARKING ANDROID APP

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Abstract: One of the prime reasons of this traffic congestion is parking on the roadside. So, a need arises to develop a parking system so that it can reduce the traffic congestion in near future. This paper focuses on a smart android based parking control application which will help public to find out a parking area in nearby your location. The mobile application will also help public to pay the parking charge by online payment system. A counter will be there in the application which will help public to calculate the amount of time your car has spent in the parking slot. This application will also track the entire process and all the previous records.

Keywords: Traffic Congestion, Parking Area, Smart Android Based Mobile Parking Control Application, Location, Track.

INTRODUCTION

This paper is focused to achieve a smart parking control and management system for Delhi city in an Android platform. This will alleviate our contemporary problems, leading towards a better lifestyle. To find out the related literature, I was conducted searches in the major scholarly databases including ACM scholar, Google Scholar, IEEE explorer, Research gate and Science Direct using suitable search strings.

A parking slot management system was proposed by Parki, Thakur Chauhan where the user can book parking-lots with the help of RFID [4]. The payment could be done by crosschecking the check-in and out time. But the system allowed to pay after checking out from the lot, then later paying the fines for further checking-in, which clearly didn't help the scarcity of parking necessity hence anyone could take advantage of the system.

Another GSM based parking system was discussed by Sahu, Gulhane Shelokar, where the system was divided into 3 modules [5]. The system interacted with the user with SMS-based authentication in each step, which enhanced the security but brings complexity in every step.

A cloud-based car parking system was introduced by Zhanlin, Ivan, Droma and their coauthors [6]. But the cloud-based parking system included a lot of software like Kafta/storm/HBase clusters, OSGi web applications in addition NoSQL. The entire propose was very complex and not user-friendly as people were looking for easy solutions all the time.

Bilodeau, Victor P [7] came up with a different technology which is called IPT (Intelligent Parking

Technology). They had focused on the problem that drivers usually faced regarding parking ticket issues. But this technology was also based on different sensors and GPS technology. So, this paper also relied on hardware and the complexity of the hardware was not warmly welcomed by the general people because if the hardware disturbs the entire system will collapse.

1. LITERATURE SURVEY

This paper examines the effect of net migration on prospective population growth in Delhi City for the next several years. The paper deals with the urban challenges in India focusing on rapid urban growth in the megacity of Delhi. Here Population of Delhi city has been predicted with the help of an ordinary differential equation model known as Malthusian Exponential population model which is parameterized by growthrate. In order to include the immigrant population, we make necessary modification of the model, which is again an exponential model where the growth rate R is the sum of the actual growth rate a and immigrant rate r .We use fourth order Runge-Kutta scheme for the numerical solution of the autonomous and non-autonomous case where we incorporate the growth rate as a function of time. We perform error estimation of the numerical solution which justifies the correctness of the implementation by using computer programming. The procedure used in this study is by comparing two projected population scenarios one with constant growth rate and the other is time

dependent growth rate based on the latest data collected through surveys of population censuses and relevant studies.

With the vast growing influx of population in the developed, industrially and technologically sound urban cities, an urgent need to make the cities smart is surmounted. The cities are made smart utilizing data sharing, artificial intelligence, machine learning, analytics, and thousands of RFID tags and sensors. One of the significant concerns of today's smart cities is the growing need to manage the vehicles on-road as well as to create sufficient and well-managed parking lots to prevent urban areas from traffic congestion. This leads to a call for highly automated parking management system self-sufficient in guiding the driver to an available parking space in the nearby area. In this paper, a real-time prototype of the smart parking system (S.P system) based on Internet of Things (IOT) is discussed. The proposed smart parking system works on an electronic device that collects the parking availability status and assists drivers in finding and selecting the desired parking space among the available parking spaces

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that effectively reduces the traffic problems and mismanagement acrossthe cities to a great extent.

We're entering a new era of computing technology that many are calling the Internet of Things (IOT). Machine to machine, machine to infrastructure, machine to environment, the Internet of Everything, the Internet of Intelligent Things, intelligent systemscall it what you want, but it's happening, and its potential is huge**.**

2. PROPOSED WORK

- After observing all the parking problems of Delhi, this proposes a smart android parking control system which will help public to find out the nearest parking area or any parking slot which is being empty as the owner of that parking may have taken his/her car somewhere else.
- If a car owner finds a parking slot in anyone's parking area, when he/she will enter into that parking area, the timer will start by the parking slot owner.
- When the car owner wants to leave the parking slot, he/she will call the parking owner to stop the counter. When the counter will stop, it will automatically generate a parking bill for the car owner.

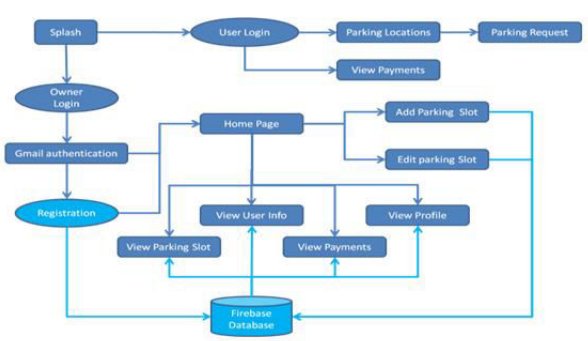

Fig 1: SYSTEM ARCHITECTURE

❖ MODULE DESCRIPTION:

➢ **Owner:**

The owner is registering to the App by entering details like name, location, parking type…etc. Then he login to the system, he may change the status of parking area. Once he gets any request of parking area, he accepts (or) rejects requests if he accept the request then he started the timer before parking and then they leave the parking area the owner stops the timer. And calculate the payment and check that they paid (or) not before Leaving parking area.

➢ **User:**

The user registers and login to the system. Then he searches the location-based parking area and chooses parking area, request to be sent. If owner gives acceptance then he checks

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the status if he wants to leave parking area he sees the payment and pays the amount by using the payment module.

- **Firebase:**
  The firebase is a database to store entire data about the application and this firebase is very useful to provide communication between owner and users. This application can work efficiently and manages the data of owner and users.
- **Timer:**
  The owner uses the timer module in this application to calculate the parkingtime efficiently. In this application the timer module displays the exact time.
- **Payment:**
  The payment module is useful for user can pay the amount to owner by choosing different modes in this application .There are two payment options cash on delivery and online payment system is like PayPal, UPI.

Fig 2: Add parking information

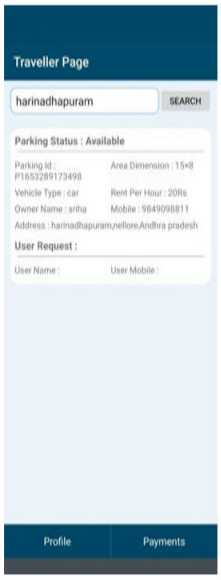

Fig 3: Location search page

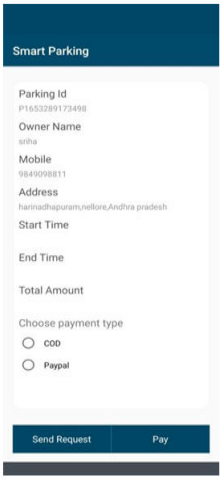

Fig 4: Send request page

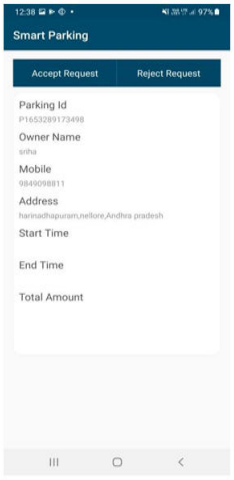

Fig 5: Accept request page

RESULTS

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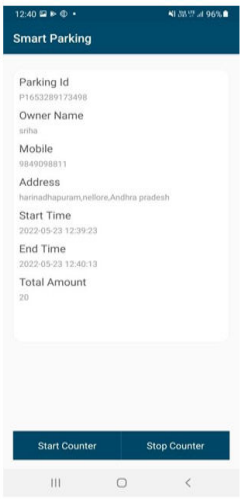

Fig 6: Time counter page

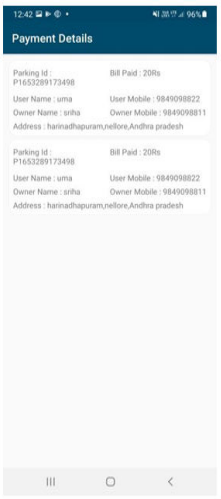

Fig 7: Bill generate page

CONCLUSION

In this paper, I proposed and developed "Android Based Smart Parking Application" is an android application in which android based parking control application has been projected which helps public to find out a parking area in nearby your location. The current application will also help public to pay the parking charge by online payment system. This application also enables you to count the amount of time your car have spent in the parking slot by a specific counter which is very secure and efficient and also more convenient way to book parking in near location.

FUTURE ENHANCEMENT

In future, I need some more features to our system to provide better services by adding feedback module. The parking system is currently developed for the androidplatform but I focusing to expand it on IOS platformas well in the upcoming days. Besides, I will try to make the parking system more space optimized [8] and efficient. Again, in this android based parking system the payment method is relied on cash or any mobile banking system. In future, I will try to build our own mobile banking system inside the application so that people don't need to depend on other mobile banking system or cash.

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