Parking IOT Management System using IOT/ML

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Abstract— Rise in population the demand for personal vehicles and parking area is increasing. Finding a parking space is one of the major issues which we face on a daily basis but we just ignore it. Keeping the vehicles parked anywhere on road is a matter of tension some times when we want to enjoy with our families or friends, or we are going for long trips, or if it is a business meeting in which we are travelling with our vehicle. For most of the working population in India, Sunday is an off day and we prefer enjoyment but parking becomes the issue when it comes to malls, amusement parks, beach or movie theatres. This study aims to determine how to handle this issue thus we can go somewhere freely without the tension of parking. Every problem has its solution all we just need to apply our brain with a little touch of technology. Park Here 24 is a website which is one of the solutions for this problem. Just with a single touch, we can choose our parking space wherever we want. To test this hypothesis structured interviews were conducted with 25 participants and results were positive. For this, we have to make a chain of owners who will be providing parking areas available at their homes, malls, movie theatres, empty plots, etc. And customer just has to visit the website choose their destination, choose their parking area and pay that's all and we are done. Our analysis shows a strong correlation between our project and the general public. We conclude that the parking issue can be solved to some extent with this idea. The exact model of Park Here 24 can bring revolution in the countries like India where population is a huge issue. Cities like Delhi, Bangalore are considered as most populated as well as these cities have highest number of urban populations which holds 2 and 4-wheelers. According to our idea we are going to build a web application which will work as the intermediator between the normal public and the service provide that is our team. In the website there will be three products available that is quick parking, list your parking, special parking or valet parking. In quick parking option the location will be tracked using GPS and then nearby parking option will be displayed on the screen which costumer can book anytime anywhere or costumer can reach the destination and pay at the point if the parking available so only additional exclusive feature over here is pre booking which can be only done by the web application. Second is list your parking in which if a customer is planning to have outing on some specific date or meeting or any event in which the date is fixed, he/she can pre book the parking which will award them special discount with special service. At last valet parking, Valet parking is luxurious service which we are providing to costumer in which if a

customer is facing any difficulty in reaching the parking destination our trust worthy valet person will park the vehicle. So overall system will crystal clear to costumer with all terms and conditions. Now coming to the technical part front end will be developed in languages like HTML, CSS and JavaScript which will be attended by the costumer where as the API will be used for connecting frontend with backend, our backend language will be python which will be under our team and four data base we will be using MongoDB. Further in future we are planning to do some additions like using IOT devices in parking lots which will make our work efficient and more crystal clear. This overall idea is just not profitable for public and us in fact it will increase the number of employments. Park Here 24 is an innovation that can bring revolution in our lives.

1. INTRODUCTION

In this project a proper chain of customer and supplier will form in which the team will tie up with owners of private residences, malls, movie theatres and public attraction sites. A pre booking option will be provided in which the customer can book on the spot parking lot after reaching the destination or they can reach there and book an area if a slot is available. If a customer is moving out of town with private vehicle or there is plan for outing there is option available called list your parking in which booking has to been done of the desired town or destination where they are moving whenever this will reward them special discount with services and our fancy service that is valet service will help costumer in parking there vehicle from the desired stuck location to the parking lot

assigned. Facilities like quick parking lot, Car safety guarantee and safe transaction will be available in the website.

2. RELATED WORK

We studied several reports and papers which gave us few extra ideas about our project. [1] The first which we studied was based on the town Changsha in China which is densely populated like towns of India like New Delhi and Bangalore. In this project IOT, GPS and DTN networking system had been used in which the wireless connection which is inbuilt in the vehicles will help in searching the parking location inside the town this system is whole technology based that reflects its completely crystal clear for costumer as well as the team who are working on it no third party is involved. There are almost 8900 vehicles available in the town so the team going to divide the vehicles into local node and foreign node. Local node is the group of vehicles which belong to the local city and foreign node is a group which belong from other cities. Now coming to the technical part this system is going to collect data from entire city and going to distribute the parking lot using the IOT devices each vehicle has the wireless connection the wireless signals will be captured by the satellites and then backend will detect the parking lot and display the location on the screen. IOT devices will be fixed in parking lots which detect and pass on the data of vehicle arrival and departure. This project is using DTN system because of faster connective and less hindrance in developed cities of China where as the 5G connection will create lots of blockage. Hence from this paper overall we can understand if we want go for something innovative in country like India, we can use IOT and DTN network connectivity for the smooth and clear work without any involvement of third party. [2] The second report is based on the car parking management system. During car parking hunt the amount of CO2 exhausted, wastage of gasoline and most important time had been discussed over here. This report shows how we can save resource, nature and time by using proper equipment and parking management system. Issues like vehicle queueing in connecting roads, guidance for driver for parking management lags in our every day life. Here one design had been explained that is traffic model design which helps in avoiding the extra time we spend on the streets in search of parking lot and reduction of emission of C02 in the nature. In this model costumer will search for nearby parking lot using the neural network or IOT device and the fuel consumption as well as pathway to reach the parking lot will be displayed on the screen. [3] In the third report the inter – vehicular transmission between vehicles using Vehicular Ad hoc Network had been focused which effects the privacy of the driver. It provides minimum communication between vehicle and parking service provider and parking will be done in minimum amount of time possible. The entire report signifies that the parking lot provider and costumer won't have any direct communication between each other and privacy of the costumer will be saved. Quick nearby parking lot will be assigned. [4] The fourth report deals the parking management issue using the neural network in this the neural network will determine the empty space availability from the visual feature obtained from the free parking areas. This method helps in solving three issues like it responds to the change in intensity of light and non-uniformity of light by using pixel pavement calculation between the parking area and the vehicle. Secondly it approximately detects the images which are having limited light and then merge with the image which is having sufficient illumination and detects the area. The third method helps in detecting the availability of area using the color detection value. Overall accuracy of the models was 99% for booked areas and 97% for clear areas. [5] This paper suggested two types of park area ideas one is theoretical and other is dynamic. In the first one the driver with perfect knowledge of parking will get parking lot assigned in the screen which will have not relation with the psychological condition of the costumer whereas the second model with connect the user psychologically and display the perfect area for the user. So, the entire conclusion of all the way that all the models proposed in every paper revolves around the parking area management system and web application with different techniques like neural networks, IOT, DTN networking, Wireless networking etc. in different countries except India. We are mainly focusing in India population and areas which densely populated.

3. PROPOSED MODEL

In this project, a proper chain of customer and supplier will be created in which the team will tie-up with owners of private residences, malls, movie theatres and public attraction sites. A pre-booking option will be provided in which the customer has taken book the parking lot before reaching the destination. If a customer is moving out of town with the private vehicle the booking has to been done of the desired town where they are moving. Facilities like a quick parking lot, Car safety guarantee and safe transaction will be available on the website. According to [3] the activeness of the parking lot had been seen during the time duration of 8:00 a.m. to 10 a.m. because of working class and at evening from 5:00 p.m. to 7:00 p.m. because this duration is considered as best duration \to spend with families and friends. There are four modules INTRODUCTION AND DATA COLLECTION MODULE: To read the relevant literature and check the feasibility of the project. Start working on the front end and implementation of codes to detect the efficiency and accuracy of the product in public point of view. Codes are available on GitHub. SURVEY AND FRONTEND MODEL PART 1: Review on Parking lot Area Management system – PARK HERE 24 from selective public for understanding the demands of the public as well as the area. FRONTEND PART 2 AND BACKEND PART: Working on the further front end of the website as well as covering the backend. FINAL TOUCH UP: Finishing the Backend and executing the complete Project on GitHub and Survey on how the project is working. According to the architecture diagram the web application will be divided into four parts first will be the login page or sign page which will help user to register or login to their ID's. Second is the home page in which our 3

main products will be available Quick parking, List your parking and Valet parking. The home page will be connected to five sub products and all the data which we will collect from the costumer will be stored by using backend to our data management system using MongoDB. With this entire frame work we will be providing the three-tier service in which we will be connecting directly to owners of the parking lot and provide the service to the third party that is our customer.
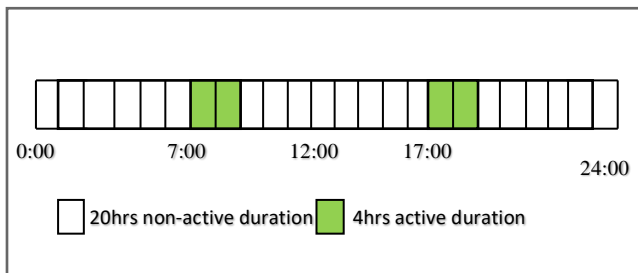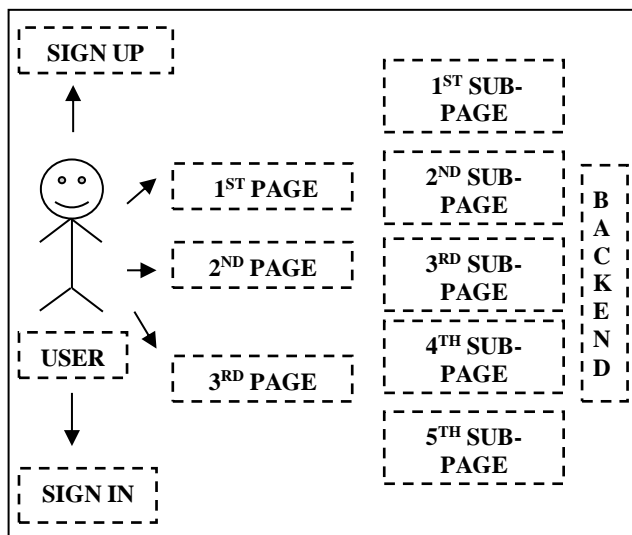

Fig 1: Survey report pf active parking timing

Fig 2: Architecture Diagram

4. DATA COLLECTION

The section includes the model testing data with survey report which had been conducted for testing the idea in public. According to this graphical representation 9% of selected audience have 1 vehicle in their houses, 27% have 2 vehicles, 31% have 3, 3% have 4. Depending on the location people build their own garage but most of them park their vehicles on road without any security. Almost every citizen has vehicle but all they lack is parking space.
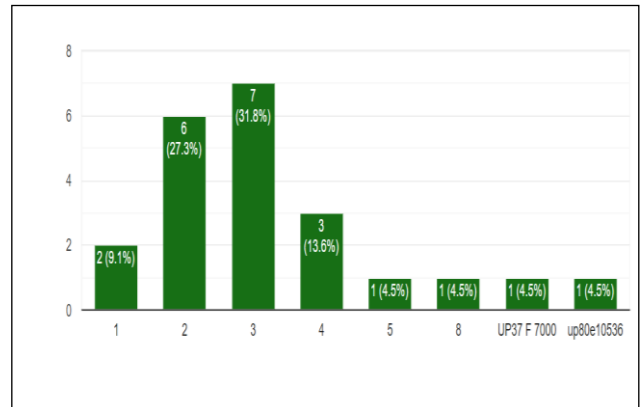

Fig 3: Survey on percentage of vehicles

5. ALGORITHM

Step 1: Front End – Connecting HTML, CSS and JavaScript file. The front part includes 3 subpages, one login and sign-up page, 5 sub products comprise of 5 sub-sub-pages.
Step 2: API – Connecting the frontend with the backend.
Step 3: Backend – Backend will be done in python. After connecting front end with backend using API all the data fetched from frontend will be stored in data base using backend and mongo-DB.
Step 4: Connecting the backend with the database.

6. FEASIBILITY

As already demonstrated in the literature review, Vehicle parking lot management system have been already implemented in past (reference 1 to 5).
• Solving the current real-world issue, segments in problem creation, usage of real basic object will be done.
• Languages like HTML, CSS, JS and for backend data management SQL or mongo DB will be used. The codes had been hosted in GitHub.
• The project is worthwhile before and after the product launch. Online based surveys had done which help in estimating the public demands and reviews.
• Product management is computer-based; full-time service will be introduced as product will be auto-generated at the same time backend team will be providing 24*7 service.
• Limit of 2-3 months is essential for proper testing and execution.

7. IMPLEMENTATION AND FUTURE ENHANCEMENT

Park Here 24 includes 4 parts front ends, survey, backend and execution. Reading the relevant literature and checking the feasibility of the project. Front end work and implementation of codes to detect the efficiency and accuracy of the product in the public point of view. Reviews from the selective public for understanding the demands of the public as well as the area. And working on the further front end of the website as

well as covering the backend. At last, finishing the Backend and executing the complete project on GitHub and Survey on how the project is working.
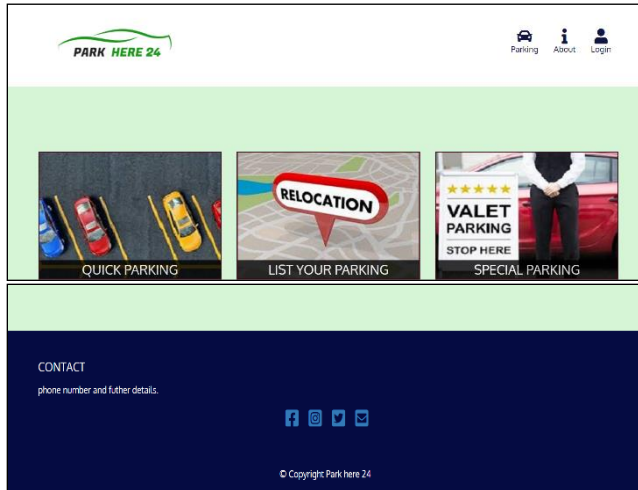

Fig 4: Frontpage

8. CONCLUSION

In this project, a proper chain of customer and supplier will be created in which the team will tie-up with owners of private residences, malls, movie theatres and public attraction sites. A pre-booking option will be provided in which the customer has taken book the parking lot before reaching the destination. If a customer is moving out of town with the private vehicle the booking has to been done of the desired town where they are moving. Facilities like a quick parking lot, Car safety guarantee and the safe transaction will be available on the website.

9. REFRENCES

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