Smart Parking System an Intelligent Web-Application for Parking Search and Reservation

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ABSTRACT: To get a space for parking a vehicle is a major issue specifically with dense traffic, in this paper, we introduce a unique approach to parking system based on nearest location and availability of parking slots. We can reserve a slot and pay in advance. The proposed system solves the current parking problems by offering parking reservations with the nearest parking from intended destination and searching time for drivers. We proposed a web bases system which allows user to book a parking slot from remote location. We have implemented android application for similar purpose.

KEYWORDS: Smart Parking, Web Application, Online Parking Booking, Resource Allocation.

I. INTRODUCTION

To find a parking is complex and time consuming process. Current studies reveal that a car is parked for 95% of its life time and only on the road for rest of 5% [1]. If we take example of England, on average a car was driven for more than 300 hours a year according to the British National Travel Survey [2]. Now where would you park your car for these very long hours? So for parking naturally the first problem caused by the increase of car owners globally on average, 35% of traffic is caused by drivers wandering around for parking spaces [3]. In 2006, a study in France revealed estimation those millions hours were spent every year in France only in searching for parking which resulted in the loss of 700 million euros annually [4]. In 2011, a global parking survey done by IBM [5] states that 22 minutes is spent on average in searching for a parking spot. With these statistics, we can assume that a great portion of global pollution and fuel waste is related to parking issues. Parking spaces are found to be more than plenty in some places and very rare to find in others. Pricing policies had played an important role in the overall parking availability for decades [6]. Here comes the important question: do we need to have more parking spaces or do we need better parking management? We believe it is the later and thus the motivation behind this work is about better parking management. The work presented in this paper combines parking reservation and nearest neighbor to overcome the parking problems.On the parking reservation side, Mouskoset al. [7] modeled the reservation process as a resource allocation problem. Their model is based on MILP with the objective of minimizing driver cost. Their model offers real time reservations with fixed pricing. Genget al. [8] had extended their work by taking into account the user's cost in terms of pricing and walking distance. In addition, they had expanded the model by adding fairness constraints and applying extensive simulations. Although the system proposed in [8] is very good, their model is still limited by being suitable only for short-term reservations and the parking revenue was not considered. On the pricing side, Shoupet al. [3] introduced new concepts which led to the development of San Francisco Park (SFPark) [9] in San Francisco which aims to overcome the traffic congestion by dynamically changing prices based on sensor historical data. In SFPark, sensors are deployed on the asphalt to gather parking information that are stored in a database and processed weekly or monthly. According to historical data, the prices are increased and decreased proportional to the expected utilization. Although dynamically

changing parking prices shall balance the supply and demand for parking and increase overall utilization, it is based on historical data and statistics which may not be accurate enough to have the proper effect.

II. PROPOSED SYSTEM ARCHITECTURE

In our system we have used KNN algorithm is combination with parking availability core language used for programming is JAVA, for database we have used MySQL and JSP is used to create web pages. Our android application is able to work with web application and can perform similar operations which are possible with website. Since people use mobile phone more than using computer so by considering this we have created this android application.
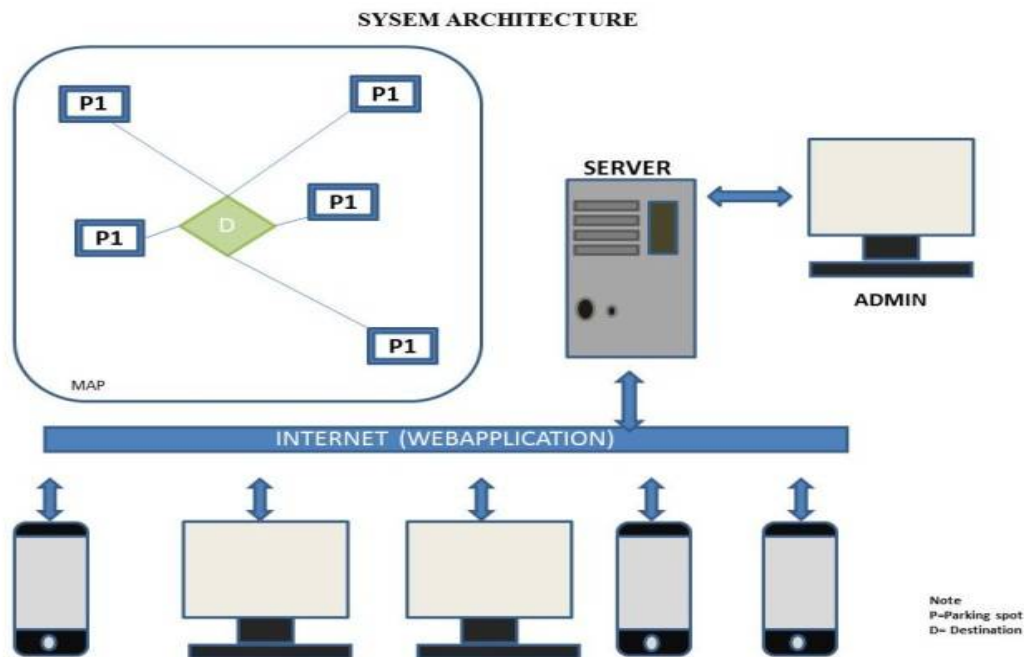

Fig No 01 Proposed System Architecture

Our assumptions to implement this system in real time environment is use of sensor based system which will be implemented at each parking slot, these sensors will send exact number of used/allocated parking slots so that our application can calculate remaining slots and hence we can reserve a parking slot at nearest location from our intended destination. Our system allows admin user to control entire system and perform necessary operations such as user control.

III. MODULS OF SYSTEM

- User Registration (U)
  The user registers his details to the system.
- User Login (U)
  User login into the system through the valid email and password.
- Search Parking (U)
  Parking area near the destination is to be searched as per user convenient.

- Book spot (U)
  Choice to be made of the paking slot as per user convenient.
- Pay Via virtual Wallet (U)
  Payment of the parking slot used.
- Manage User (A)
  Management of the users and their data.
- Manage Reservations (A)
  Management of parking slots.
- Add Parking Information (A)
  Adding and Deletion of parking slots.
- Book Parking (C)
  Onspot Manual booking for customer at parking destinations.
- Cancel / Stop Booking (C)
  Stop timer of booked slots at time of payment,

Here (U)=User, (A)=Admin, (C)= Care Taker.

IV. FUTURE SCOPE

In future the project can be deployed on cloud and is very useful in future smart cities. For this purpose we need to use sensor based system which will dynamically detect available parking slots.

V. CONCLUSION

Our system helps drives to find a optimal parking spot. Finding a spot for parking is based on a unique algorithm which is combination of KNN i.e. k nearest neighbor and availability of parking slots. Special security feature is introduced which contains QR code mechanism to allow driver who has booking QR code, It allows only those cars which has pre booking The designed system could be applied everywhere due to its ease of usage andeffectiveness and also its makes smart parking system a complete automated system without any human intervention.

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