

**Okos (Smart) Parking System**

¹Ms. Bharti Nana Durgade, ²Ms. Supriya Yuvraj Gaikwad, ³Ms. Namira Imtiyaz Faras, ⁴Mr. Tushar Shyamsundar Rath, ⁵Ms. Priyanka Pandurang Ingavale,

^{1,2,3,4,5} Computer Science And Engineering, DKTE Society's Yashwantrao Chavan Polytechnic, Ichalkaranji.

Abstract —Now a days, increase the population, city development in less space, mismanagement of available parking space, are a lot of problems with car parking in metro city. "Okos Parking System" provides user an easy way of booking parking slots through an application. User can view various parking slots and check for availability of slots. Whenever a user books a particular slot it will be marked red and all the available slots will be green. Booking can be done through net banking. On successful payment a parking number and unique QR code is sent to user's email or to his mobile number for further enquiry. Hence this application reduces the user's effort and time of searching the parking slot and also avoids conjunction of traffic.

Keywords-Okos parking system, booking, net banking, QR code, traffic.

I. INTRODUCTION

Okos parking system is a part of Intelligent Transportation Systems (ITS). A set of advanced services and applications are provided through the revolutionizing the overall traffic and travel experience. In parking guidance and information systems, drivers know the information about inside controlled parking areas and gives to vacant parking spots. Parking information is being displayed on variable-message signs (VMS) at roads, streets, and intersections through the Internet [1], [2]. In PGI system, the development of autonomous vehicle detection and parking spot monitoring, through the use of sensors placed in the accessibility of parking spaces for vehicle detection and surveillance [3], [4]. The aim of PGI systems are reduces the travel time and vehicle benefits [5], [6]. The objective of PGI systems, e-parking is an innovative platform which allows drivers to gain parking information before or during a trip, and reserve a parking slot [7]. The drivers can be access the central system using mobile phone or Internet. Each car at entry points, and triggers automatic reservation checking and parking payment using Bluetooth technology [8]. This Suggest that traffic congestion can be salved by controlling the parking price [2].

Our proposed system presents a smart parking system that regulates a number of vehicles to the nearest parking space at any given time based on the parking space availability. "Okos Parking System (OPS)" is implemented using Android Application. The user requests the Parking Control Unit to check the status of available parking slots. As soon as the user request, all the available free slots are displayed to the user. If the availability of parking space is confirmed, the user can book the parking slot and proceed to pay. The vehicle follows its path towards the starting of the parking area. The user fixes his slots by scanning his QR code by the concerned person at parking area. After communicating, the vehicle will further follow its path to the allocated parking slot. After successful parking the slot details are updated simultaneously in the Administrators database. Finally the time to find for an empty parking slot is minimized.

The main responsibility of the Okos Parking System (OPS) is to help the user to find an area where parking is available and total number of slots free in that area. Thus our proposed methodology reduces the user's effort and time of searching a parking slot.

II. LITERATURE SURVEY

D. Teodorovic and P. Lucic. "Intelligent parking systems" [2], This article discusses the basic concepts of parking reservation system and parking revenue management system. The proposed "Intelligent" parking space inventory control system, based on a combination of fuzzy logic and integer programming techniques, decides whether to accept a new driver's request for parking or "online" decisions. The first step of the proposed model is to develop better parking strategies for different methods of vehicle parking. These parking policies are developed using an integer programming approach. In the second step, specific rules are defined by learning the best strategies. The difference of the proposed approach is that the rules are drawn from the set of selected examples assuming that the mode of transportation for the future is known.

K. Cheung and P. Varaiya. "Traffic surveillance by wireless sensor network" [3], Traffic Surveillance Systems provide data used by Intelligent Transportation Systems (ITS). Disadvantages of inductive loop detectors have led to the discovery of reliable and cost-effective alternative mechanisms. A real-time vehicle detection algorithm is developed for both signalsMagnetic sensors turned out to be superior, achieving detection rates of up to 97% in the current field, and further research using acoustic sensors was discarded. Vehicle classification and identification schemes have been developed and tested for low-cost, low-power platforms with very limited computational resources. Vehicle classification

algorithms require orders of magnitude less computation resources while achieving the correct classification rates compared to the best of the vehicle classification schemes published in tests with a large database with 800 trucks. The algorithm for testing the vehicle is tested on a limited left-re-identification experiment. The result is exciting, but more work is needed. Flexibility, ease of installation, remote maintenance, low cost and high accuracy of wireless sensor networks will lead to their ubiquitous deployment, thereby providing the necessary micro vehicle detection to effectively implement effective traffic monitoring and control. Wireless sensor networks are 'future proof'. Additional methods, such as temperature, humidity, and pollutant sensitivities, can be included in the same node or in a separate node to monitor other aspects of the traffic system. Wireless communication networks can be used to provide another way of 'vehicle-infrastructure integration' to communicate with vehicles.

Yanfeng Geng, Christos G. Cassndras, "A New Smart Parking System based on optimal resource allocation and reservation"[9], We propose a new "smart parking" system for urban environments. Ensures that the system designates and maintains an optimum resource (parking space) for the user's driver, which combines proximity to destinations and parking costs, while also effectively utilizing total parking capacity. Our approach solves the mixed integer linear event (MILP) problem at each decision point, from time to time. Each MILP solution is a good allocation based on current information and is subject to random events such as requests or parking space available by new users. This allocation is updated at the next decision point, ensuring that resource reservation is not in conflict and no user is assigned more resources than the current cost function value.

III. SYSTEM ARCHITECTURE

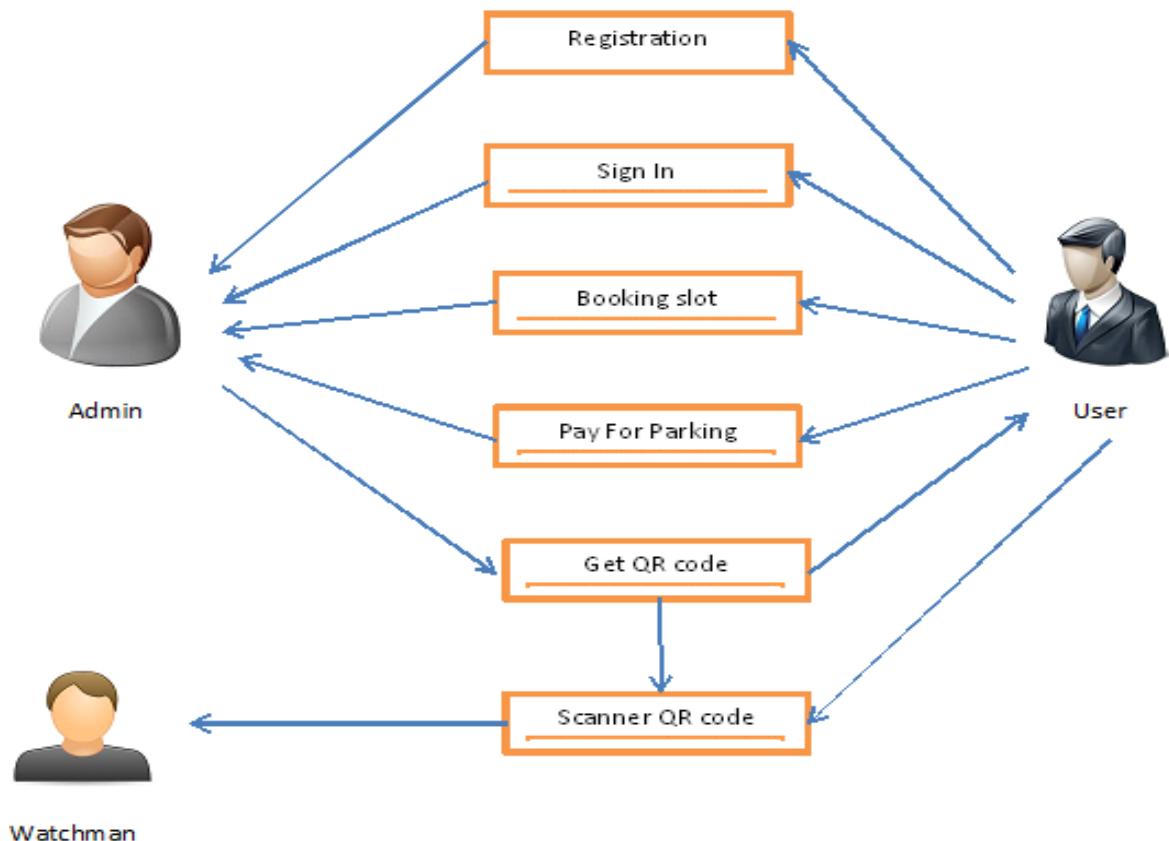


Fig. 1: System Architecture

First User Can register the application and after registration user can be logged the account. User can see the parking slot and choose the parking slot and time. After that pay for parking slot using internet banking and get QR code. User will reached this parking place, by scanning the QR code to the watchman then park the car.

IV. Methodology

1. User Module:

This module of the application deals with the user interface/user experience. This module provides the user with the flexibility of registering, logging in, booking for parking. If the user is new to the application then, the user must register in the application by providing the user's details. After the registration, the user log in using the

user-id and password. Once the user logs in, then the user browses the parking slot then books that parking slot and pay for parking and get QR code.

2. Admin Module:

This module of application deals with user module and watchman module. Admin can handles the all modules like user module, booking slots, payment issue and watchman module. In admin module, can do add slots, view feedback, view users, view booking etc.

3. Booking Module:

This is the main module of the application and it deals with the booking of the parking slot. When the user is ready for booking then the booking module comes in the scenario to provide user the necessary information for booking. The user can select free slot and request for free slot. After booking slot and paying successfully user will receive a QR code to his mail and he/she should get it scanned while parking vehicle.

4. Watchman Module:

This module consists of scanning the QR code and giving some feedback to admin. The QR code should be scanned two times while entering and leaving destination.

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