International Journal of
Marketing Management

PARKING MANAGEMENT SYSTEM

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ABSTRACT:

With growing, Car parking increases with the number of car users. With the increased use of smartphones and their applications, users prefer mobile phone-based solutions. This paper proposes the Smart Parking Management System (SPMS) that depends on Arduino parts, Android applications, and based on IoT. This gave the client the ability to check available parking spaces and reserve a parking spot. IR sensors are utilized to know if a car park space is allowed. Its area data are transmitted using the WI-FI module to the server and are recovered by the mobile application which offers many options attractively and with no cost to users and lets the user check reservation details. With IoT technology, the smart parking system can be connected wirelessly to easily track available locations

. INTRODUCTION

The number of car client's increases was requested more parking spots, and with the growth of the internet of things causes smart urban areas to have picked up grind popularity. In this way, issues, for example, traffic blockage, constrained vehicle leaving offices, and street security are being tended to by IoT. So, several parking organization systems have been organized to decrease such traffic issues and improve the comfort of car users, it has combined smart mobiles, wireless algorithms, and mobile applications. aThe Internet of Things (IoT)

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equals "=' Physical devices, vehicles, structures, and different things implanted with hardware "+" Controller, Sensor, and Actuators "+" organize a network that lets these things to gather and exchange information (Internet) [2]. Sensors are deployed in smart systems, which in turn collect information from the device for processing and analysis .So, Sensors would be deployed in the parking area and through the mobile application for helping the user to know the freedom of parking places on a real-time basis with more efficiency, and less cost [3]. A smart parking system reduces the time to locate available places and reduces fuel consumption. The paper is organized as follows: First, it presents the concept of the smart parking system and its various functions, then its reviews previous research and studies on the implementation of smart parking. Then it describes the system implementation and operation and gives a conclusion of the smart parking application.

SURVEY OF RESEARCH

There exist various practices in the global smart parking scene. The intelligent parking architectures that are discussed in this section present the universal sleek parking case carried out in Barcelona,

Bussan Riga, Santander, and Valletta. The overview shows the various communication technologies specific to certain smart parking while spotting the major aspects that influence intelligent parking performance. Barcelona, a Smart City, has achieved a wide range of the merits through investments in IoT for urban systems, including smart parking technology. Sotres et al. explain how city has invested in deploying system for motorists to guide them to technical-parking spots. A 600 of wireless parking sensors were set on the streets of Barcelona, les Cortes district, in 2014. The aspects were placed below the asphalt, and the sensors were then used to find the available parking spaces and notify the motorists. The program was informed to chop down on emissions and congestion by providing motorists real-time directions on the availability and location place. of open parking spaces. Access to sensor data was conducted through the proprietary application programming interface (API) of varying technology vendors operating in the smart parking space. Another case scenario is Busan city, South Korea, where loT technology was utilized as part of the first-generation IoT-enabled smart city pilot project. The proposed

intelligent parking services were enhanced annually between 2015 and 2017. In the first year (2015), the parking sensors were fixed to public parking lots to provide real-time parking service data. In the following year, closed-circuit television (CCTV)-based image recognition technology was implemented to gain better insights into the occupancy data. Finally, in the final year (2017), parking spaces with electronic vehicle charging stations were incorporated. Six indoor ones were selected to be part of the smart parking use in the wise lot project for 2014 intelligent parking sensors. They provide real-time occupancy data in every parking location. The universal grading is proposed by the wise-IoT framework for the platform's interoperability. Another case is that of Riga city, which has paid parking services. The city has an underground parking space for around 167 vehicles, which are managed through an installed, automated parking ticketing machine located at the parking's entrance and exit, where drivers acquire a ticket with a QR code with time stamps. The success of this system is such that the vehicle that exceeds the parking time limit will not be capable of parking without being surcharged with additional parking time.

The city of Santander in Spain also experimented on the implementation of a smart parking solution, with parking lots with built-in inductive sensors. Here, over 250 outdoor parking sensors were installed in the city's primary parking centers to detect the availability of parking spaces. The advantage of these sensors is that they are buried under asphalt, and they work based on ferromagnetic detection. An API was created for the utilization in the exchange of information through the sensors and the client, where data that are collected from the devices therein are then dissipated to the manufacturers back in real time, and they are finally processed and relayed back in the form of free occupied events. per parking spot. Interestingly, this framework is also utilized in the municipality for traffic management tasks and the control of traffic lights. In the city of Pisa in Italy, extensive tests for innovative parking solutions have been conducted, and their results have been analyzed. The analysis covered mainly long-/medium-term parking lots mostly used by commuters and was also focused on the different typologies of parking spaces existing, e.g., regular, disabled-reserved, and evehicle-reserved. This analysis was

performed using autonomous systems based on wireless smart cameras, which locally acquire and analyze images while only. gating numeric results toward the centralized server. The objectives were different: having an autonomous intelligent system using energy harvesting through photovoltaic panels; providing a Web platform and mobile applications; and evaluating and validating the propa design while considering integration with the existing traffic management system. These applications primary purpose is to integrate collected data from the developed wireless sensors and to transmit the aggregated results to a higher hierarchical level.

METHODOLOGY

One of the most important problems facing large cities is congestion and parking . So, using Automated Parking System Management is an efficient technique using the Internet of Things to manage the garage [4]. Smart parking is an electronic tool that enables the user to find vacant parking spaces through information technology and by using appropriate sensors [5]. Among the most used types in smart parking, systems are data routing systems, smart payment systems, and electronic car parks. These types require disclosure of whether parking spaces are vacant or not. With the user registration in the system, a unique identifier is created for him, and with the booking, it has the booking details, and via their smartphones, the entire time, exit time, and money are calculated. The System building consists of, the lowest level, including the functions of sensing, data transmission is created during a middle level, and upper-level deals with the storage and processing information, and user interfaces.
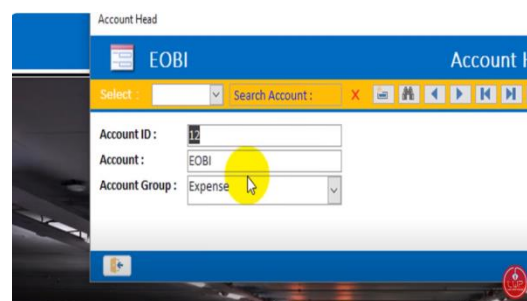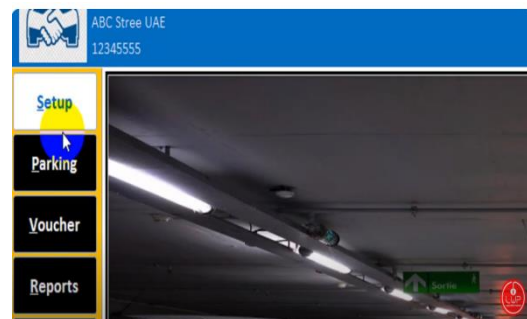
Finding a place to park cars involves three-stage. First, the parking area which has Arduino devices along with the sensors to interact between the user and the parking area. The second stage contains the cloud services which act as an intermediary between the user and the parking area. The third stage is the user side. The user gets a notification of the availability via mobile applications. For each parking region, Arduino sensors are positioned, and the sensors detect the number of parking slots, the number of free, and booked slots. WIFI module is used for communication between the mobile app and sensors.

CONCLUSION

Our exclusive parking lot management project is designed to resolve the day to day parking management issues. This system is meant for commuter toward an available parking slot. Displays the number of vehicles in the parking lot.

That is our only intention to create this website.

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