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"SMART PARKING BASED ON IoT"

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ABSTRACT

Parking is a major issue in many cities, whether the city is large or small everyone faces same issue. Therefore, to reduce the complexity of parking we have designed a Smart Parking System. This Smart Parking System is beneficial to everyone, those who have empty spaces in front of there place and those having huge vehicles to park. Our system will allow both the parties to communicate easily with agreeing certain terms and conditions. We will also use some controllers and sensors to get real time information of the empty places, so that it can easily be assigned to a vehicle owner. This system will reduce the excessive vehicles on roads which are parked unnecessarily on footpaths.

Keyword: Parking complexity, Smart parking system, Controller, Sensor.

I. INTRODUCTION

Now a day's population is increasing day-by-day, in India itself population is increasing by 1.19% per year. The case is same with the vehicles, it has increased 37.14% in last few years. According to TOI 53,700 vehicles are registered every day in India. Out of all the vehicles only 66% of vehicles are parked at proper place in the city. Smart Parking System is a plan proposed to resolve the complexity in parking. It will allow the vehicles owners to get a right and safe place to park as well as beneficial to people having empty spaces near their house.

Figure 1: Empty spaces outside house

Smart Parking System will allow people to rent there parking place if they are not using it for specific time. Vehicle owners who are not able to get proper space to park the vehicle can contact these persons and pay them for parking. Since proposed smart parking is based on IoT so next few lines provides introduction about what is IoT.

Internet of things describe itself as the wireless network of interconnected object that can be anything like doors, fans, cooler, washing machine etc which can communicate with each other with our intervention. [2]. This basically requires few artificial intelligences or when our environment will be embedded with sensor and technologies such as RFID (Radio Frequency Identification), WSN (Wireless Sensor Network), software, actuators etc. Paper is divided into 4 sections. Section 1 briefly describes the need of smart parking. Section 2 focuses on proposed plan that explains how to implement smart parking based on IoT. Section 3 elaborates literature survey that contains explores conventional parking system; finally section 4 concludes the paper.

II. PROPOSED PLAN

How?

The major question is how is this possible? We are designing an Application compatible with Android and iOS which will contain the location of the empty space and the details of both parties. Once both are on a deal the payment gateway will be opened for the vehicle owner. Besides this, the application will be smarter that we think. The app will also show the distance from the parking space to the destination of the vehicles owner. It will also send alerts like "It's time to get your car back" which means the deal is going to over within some time. Here comes another advantage, even after this alert if both parties agree to extend the time they can.

Will every time system should be updated manually?

No, the Smart Parking System is an Automated system. We will use a Smart Parking Sensor (Figure 2) to detect the vehicle is parked or the space is empty. The Real Time data from the sensor will be given to the owner of the space on the application. Based on this data only space will be allotted to the vehicle owner, who's destination is nearby.
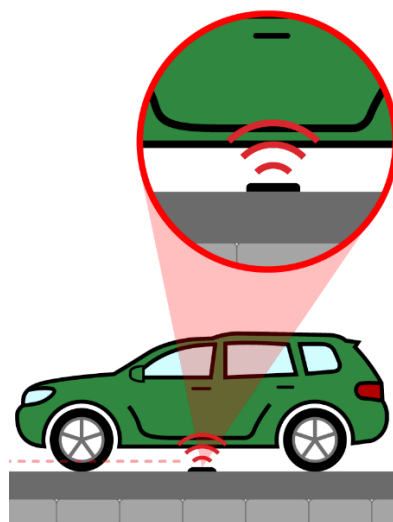

Figure 2: Smart Parking Sensor

What is Real Time?

Real Time means the data from the sensor will be sent to the application of the owner of space and once the deal is on it will be sent to both the persons. (Figure 3) Plastic is one of the most disposable materials in the modern world. It makes up much of the street side litter in urban and rural areas. It is rapidly filling up landfills as choking water bodies. Plastic bottles make up approximately 11% of the content landfills, causing serious environmental consequences.

Figure 3: Real Time Data

III. LITERATURE SURVEY

Conventional Parking Systems:

1. Multi-Level Car Parking

A multi-level car parking system is meant to maximize car parking capacity by utilizing vertical rather than horizontal space. However, with land in the metros and 'A' grade cities becoming scarcer and dearer and plots getting smaller, conventional parking is proving non-feasible. It is often found that ramps or car lifts consume so much parking area that no increase in parking capacity is possible[1]. In such cases, mechanized car parking systems make creation of extra parking capacity feasible.

Figure 4: Multilevel Car Parking

2. Automatic multi-level car parking

This system involves lower building cost per parking slot, as they typically require less building volume and ground area than a conventional facility with the same capacity. However, the cost of the mechanical equipment that is needed within the building to transport cars internally needs to be added to the lower building cost to determine the total costs. Other costs are usually lower too; for example, there is no need for an energy-intensive ventilating system, since cars are not driven inside, and human cashiers or security personnel may not be needed. Automated car parks rely on technology like that used for mechanical handling and document retrieval. The driver leaves the car in an entrance module, and it is then transported to a parking spot by a robot trolley[1]. For the driver, the process of parking is reduced to leaving the car inside an entrance module.
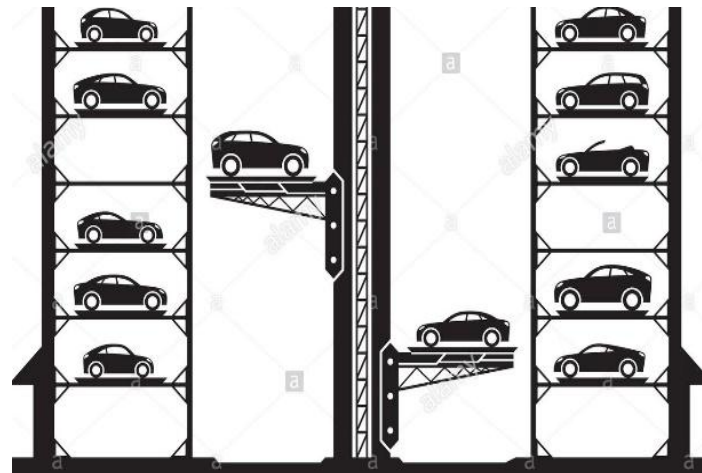
Figure 5: Automatic multi-level car parking

IV. CONCLUSION

The Smart Parking System is better than these traditional systems: -

1. *Infrastructural Cost-* The above-mentioned systems require a huge cost to build and maintain the multi-level parking. On the other hand, our system requires a minimal cost for installing sensors and marking the parking spot.
2. *Park nearby-* The conventional parking is at a specific place which may be more than walking distance from the destination. Smart Parking System allows you to find a parking spot near your destination i.e. one can park on-the-go.
3. *Minimal Rent-* Unlike other conventional systems the rental cost of every parking spot will be on hourly basis and customer will also be offered monthly and yearly offers.
4. *Additional Income-* People who provide spot for parking will also be given a particular amount.

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