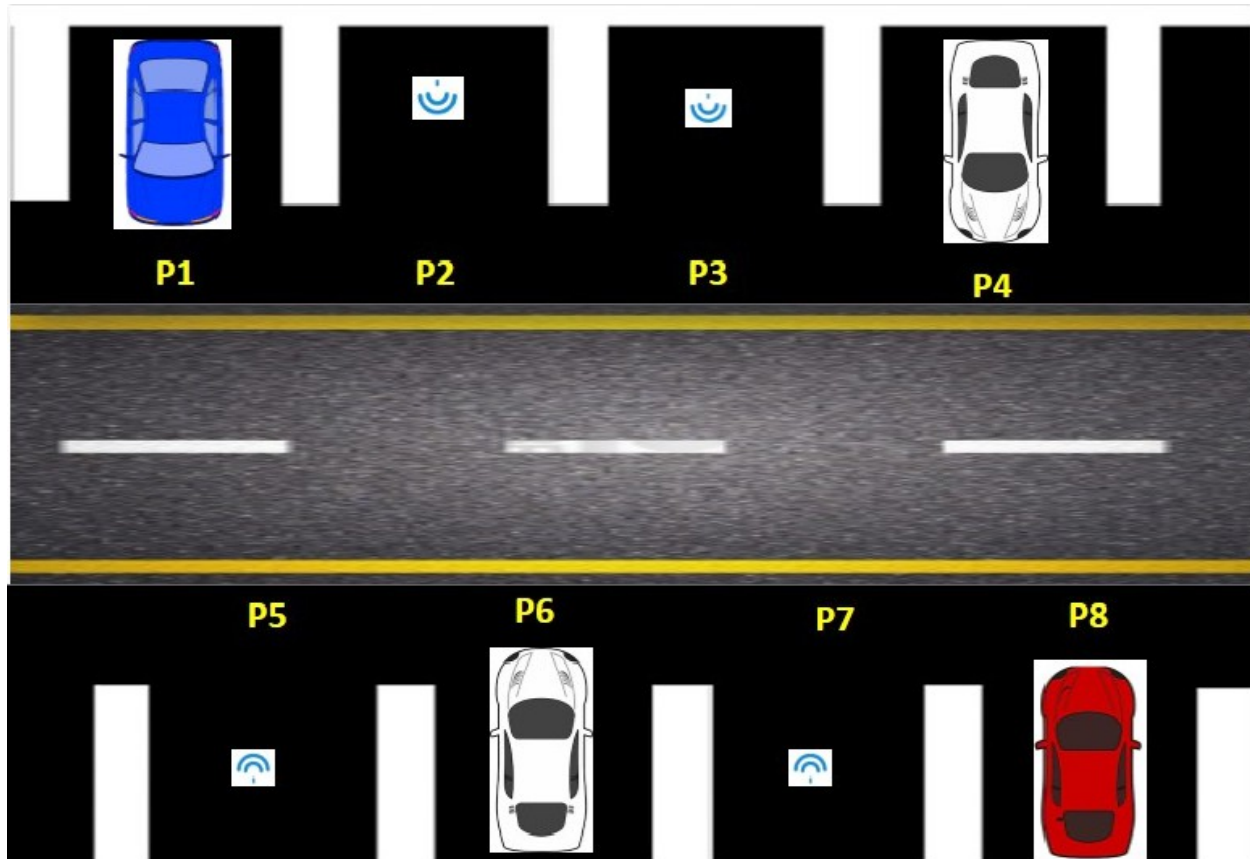


Smart Parking

(A better solution for curtailing the urban critics which includes pollution, time compelling and safety)



Smart parking using Internet of Things (IoT) allows users to park vehicle in a very short period of time without any traffic congestion at parking zone and also provides a mobile application to remotely reserve, check and navigate the available parking lots.

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Smart parking system obtains information about available parking bays in a particular parking area and that real-time data available to the users to place their vehicles at available positions using a mobile application. It involves using low-cost sensors, real-time data collection, and mobile-phone-enabled automated payment systems that allow people to reserve parking space in advance.

Why Smart parking is needed?

Vehicle parking is the major problem with the increase in urban population and vehicle size in the luxurious segment, confined parking spaces in urban cities. Searching for a parking space is a routine and big tedious activity for many people in cities around the world.

According to the reports

- ☞ 30% of the city traffic in twentieth-century is caused by the drivers looking for an available parking lot and average search time for that is more than 8 minutes.

Traditional parking system is no way provides a good solution to address the above requirements.

Draw backs of traditional parking system:

- Time consuming process

Classification: Public

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- Required more man power
- Maintenance cost is high
- Fuel consumption is more
- Less secure
- Loss in business

To avoid the above mentioned drawbacks smart parking system should be implemented.

If implemented successfully according to the reports

- ☞ Smart Parking could result in 2, 20,000 gallons of fuels saving till 2030 and approx. 3, 00,000 gallons of fuels saved by 2050.
- ☞ The global smart parking system size is expected to reach USD 368.7 million by 2024 according to a new study by Grand View Research, Inc.

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How does smart parking works?

- Smart parking using Internet of Things (IoT) automates the entire parking zone by obtaining the real-time data from the wireless sensors that are installed at each and every parking lots and provides a mobile application to remotely reserve, check and navigate the available parking lots.
- Smart parking includes three modules-IoT hardware platform, Parking management server, and Mobile application.
- IoT Hardware platform includes sensors, processing unit and communication module.This wireless sensor network (WSN) node obtains the parking lot status and transmits that information to the gateway node using a communication protocol.
- Apart from detecting the vehicle it also provides additional information like time stamps i.e., vehicle parking time duration.

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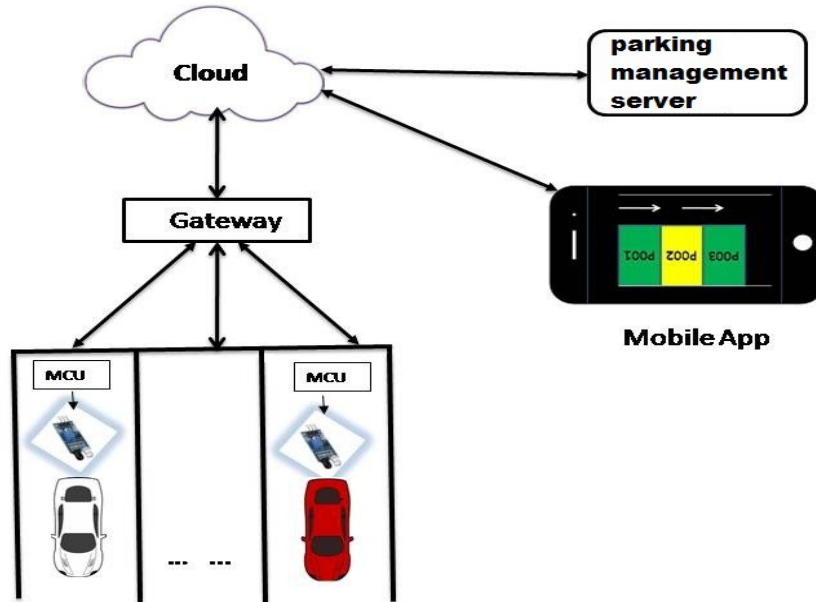
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- Gateway node collects the heterogeneous data from all the wireless sensor nodes and rearranges, normalize the data and will send it to the cloud.
- Apart from this, gateway will read commands from the cloud, and will send those commands to the WSN nodes.
- Parking Management Server (PMS) monitors all the parking spaces and also manages metering and billing for all users.
- Mobile app offers an easy interface to assist the driver to find, reserve a vacant parking space and manages the driver parking usage and billing.

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Block diagram of Smart Parking

Benefits:

Smart parking system offers various benefits to the users, operators and provides a better urban parking environment.

Users:

- ☞ Advance booking and tracking.
- ☞ High security to vehicles.
- ☞ No wastage of time.
- ☞ Fuel consumption is less.
- ☞ Comfort and satisfaction.

Operators:

- ☞ Optimization of parking space usage.
- ☞ Less maintenance cost i.e. lower system cost.
- ☞ Higher profits in business.
- ☞ Long-lasting approach.

Additional benefits:

- ☞ No traffic congestion at parking areas and this in turn reduces city traffic.
- ☞ Provides better urban environment by reducing the emission of CO₂ and other pollutants.

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