

# **TOPIC: SMART PARKING**

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### **1.Project Definition:**

The project involves integrating IoT sensors into public transportation vehicles to monitor ridership, track locations, and predict arrival times. The goal is to provide real-time transit information to the public through a public platform, enhancing the efficiency and quality of public transportation services. This project includes defining objectives, designing the IoT sensor system, developing the real-time transit information platform, and integrating them using IoT technology and Python.

### **2.Design Thinking:**

A smart parking system is a system that utilizes the IoT concept to manage the parking area. It can automate the parking gate, record the transaction, validate or authorize the parking user, or even send

information about available parking slots. In this study, we describe the design of a smart parking system using the IoT concept to enhance the parking system by automating parking records and improving the security system by utilizing a smart card. The smart parking system will provide fully automatic with secure control and the ability to monitor the system using an online monitoring system. It is also designed to minimize the use of the internet on the part of users. The smart parking system was also brought in to manage the multiple numbers of a parking lot, allowing it to maximize the parking lot's utility. This study aims to understand the architecture and communication between various hardware, software, and communication protocols to develop an ideal smart parking system.

## 1. Project Objectives:

In this study, we focused on applied research. We focus on the application of smart cards and the internet of things (IoT) to the smart parking system. This study was done by implementing, testing, and evaluating the ability of smart card and IoT concepts to solve a practical problem in the parking management system.

## 2. IoT Sensor Designs:

Internet of Things has witnessed a significant and significant development in many sectors. Internet of Things addressed technological constraints such as storage, processing and energy. Internet of Things is able to use devices heterogeneous in nature and allows different devices to communicate and exchange data in an acceptable format. The Internet of Things consists of a large number of information sources.

The proposed system consists of smart parking using the Internet of things to monitor any nearby parking and reference to parking. There will be an application for phones allows the user to search and check the availability of parking and reserve parking for a limited time without loss of time and effort.

### 3. Real-Time Transit Information Platform:

An IoT-based parking system is a centralized management that enables drivers to search for and reserve a parking spot remotely through their smartphones. It offers a convenient arrangement for drivers to park their cars when they are looking to avoid potential traffic congestion. The system's hardware sensors detect available slots and communicate the information to the drivers in that area in real-time. IoT technology ensures that they do not have to worry about finding an available space again – allowing them to travel conveniently.

Besides, the connected device sends alerts about peak times and surcharges. No one wants to struggle to find a parking slot or pay more at any given point. Using smart parking technology will help maximize the consumption of existing parking space, increase the effectiveness of parking operations, and facilitate easier traffic flow with just a few taps on a mobile app. Smart parking solutions are intended to give drivers complete control of their journey - from start to finish - without having to hunt for parking. The IoT technology helps save costs and minimize travel time. IoT forms the foundation for real-time data collection and analysis.

### 4. Integration Approach:

IoT devices equipped with smart parking sensors collect data, which is then preprocessed, encoded, and transmitted to the data-sharing platform through various communication protocols such as Wi-Fi, cellular networks, or LPWAN. Secure data transmission and validation measures ensure data integrity and confidentiality.

The platform, equipped with APIs or MQTT, receives and stores the data, making it accessible for real-time display to the public. This seamless process enables the public and relevant authorities to access crucial heavy traffic sites information, promoting awareness and informed decision-making regarding safe and secure parking.