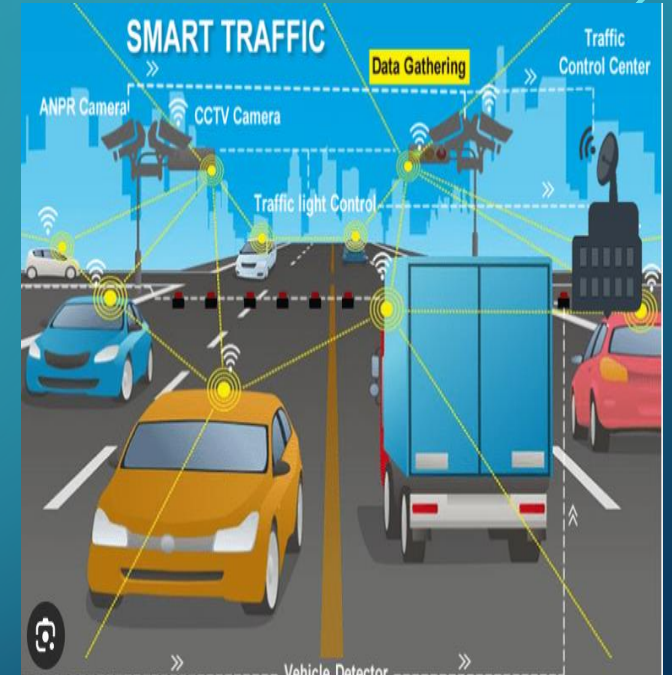


SMART CONTROL TRAFFIC USING IOT: KEY FEATURES.



- **Key Contents**
- Role of IoT in Smart City Traffic Management
- Advantages of a Smart Traffic Management System
- Functioning of Traffic Monitoring System Using IoT Capabilities
- Application of IoT in Traffic Management
- Key Features of a Smart Traffic Management System
- Implementation of a Smart Traffic Management System – Key Elements

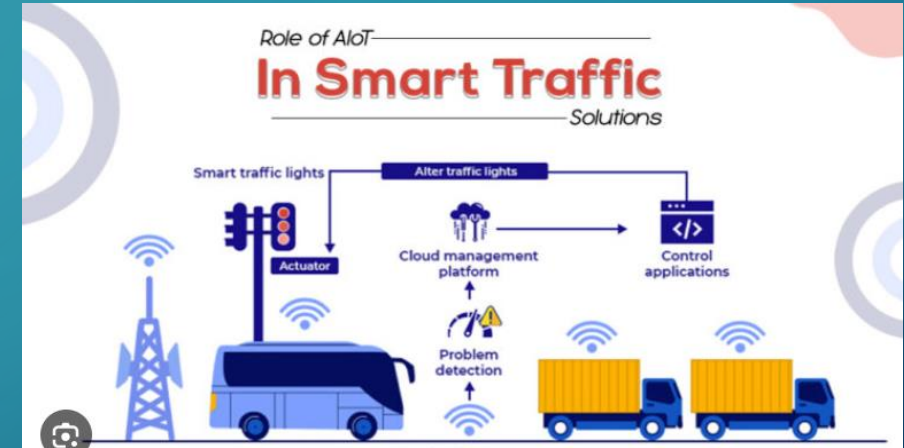


ROLE OF IOT IN SMART CITY TRAFFIC MANAGEMENT:

- Expand the capacity of city streets without having to build new roads.
- Optimize the traffic flow and keep the drivers safe. It would include cameras, sensors, and cellular technologies that automatically adjust traffic lights, expressway lanes, speed limits, and highway exit counters.
- Transmit accurate information about available parking spaces to citizens in real-time
- Collect data on congestion and improve traffic signaling to reduce blockages and optimize commute
- Locate incidents and report them to emergency rooms immediately with road sensors and video surveillance
- Employ real-time data feeds to ensure the streetlights turn dim or brighten up per the changing weather conditions and the onset of day and night

Advantages of a Smart Traffic Management System

- Cleaner, greener, safer, and more accessible roads are a few benefits of implementing IoT and intelligent technology.
- It helps with the following:
- Reducing traffic jams and accidents on the streets
- Ensuring immediate clearance for emergency vehicles
- Facilitating safer and shorter commute times
- Reducing congestion & energy consumption at intersections
- Offering significant productivity benefits with real-time monitoring of crucial infrastructures
- Reducing operating costs with efficient traffic management processes
- Ensuring compliance with the regulations for reducing the carbon footprint
- Saving billions of gallons of fuel wasted every year
- Accurate tracking & quick recovery of lost and stolen vehicles



FUNCTIONING OF TRAFFIC MONITORING SYSTEM USING IOT CAPABILITIES

City governments can improve their operations & infrastructure by placing IoT sensors and tracking devices on roads and highways for recording, analyzing, and sharing data in real-time.



DATA COLLECTION AND SENSORS:

- Set up IoT sensors and devices for data collection (e.g., temperature, humidity, air quality, traffic flow).
- Use Python to interface with these devices and collect data.

Example Python code for data collection from a temperature sensor

```
import random
```

```
def get_temperature():
```

```
    # Simulate data from a temperature sensor
```

```
    return random.uniform(20, 30)
```

DATA STORAGE:

- Choose a database system to store collected data (e.g., MySQL, PostgreSQL, or NoSQL databases).

```
import psycopg2
```

```
def store_data_in_database(data):
```

```
    connection = psycopg2.connect("dbname=smart_city user=your_user  
password=your_password")
```

```
    cursor = connection.cursor()
```

```
    cursor.execute("INSERT INTO sensor_data (timestamp, temperature) VALUES  
(NOW(), %s)", (data,))
```

```
    connection.commit()
```

```
    cursor.close()
```

```
    connection.close()
```

```
base.
```

WEB APPLICATION:

- Build a web-based user interface for city administrators and citizens using a Python web framework like Flask or Django.

Example Python code for a Flask web application
from flask import Flask, render_template

```
app = Flask(__name)
```

```
@app.route('/')  
def index():
```

```
    # Retrieve and display smart city data on a web page
```

```
    temperature_data = get_temperature()
```

```
    return render_template('index.html', temperature=temperature_data)
```

```
if __name__ == '__main__':
```

```
    app.run(debug=True)
```


IOT-BASED LITTER FINE TICKET MOBILE APP:

Challenges:

- Poor visibility into operations with the Fixed Penalty Notice being issued based on employee number, location & details of the offender
- No mechanism for issuing receipts on the move for field officers
- No encryption in the payment gateway

Our Approach:

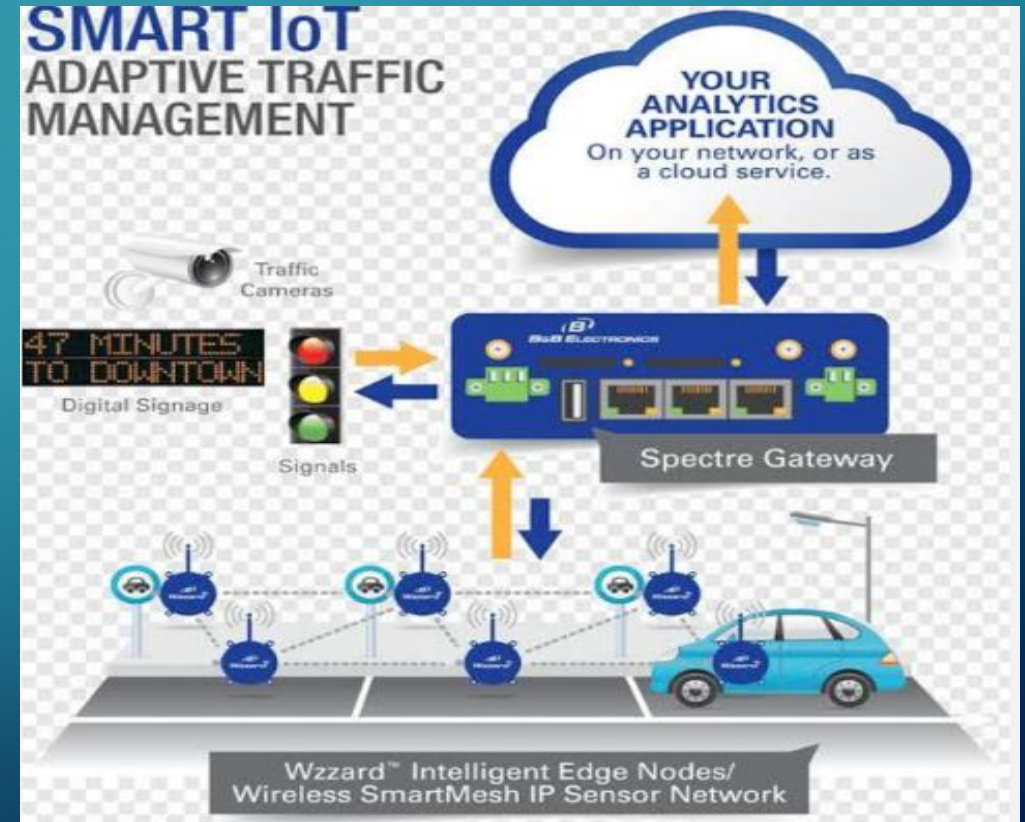
- Our team designed an Android app that allows officials to record, submit & manage offenses
- It integrates the payment gateway and allows corrections on a unified system
- We optimized the user interface for their online portal and enabled online and offline synchronization
- We helped optimize & secure employee logins & authentication for extracting the details of offenses & penalties

Benefits Delivered:

- Data-driven analytics for on-demand reporting
- End-to-end encryption of data
- Easy access to online & offline data

Technologies Used:

- Android
- Microsoft .NET
- SQLite
- Bluetooth 4.0

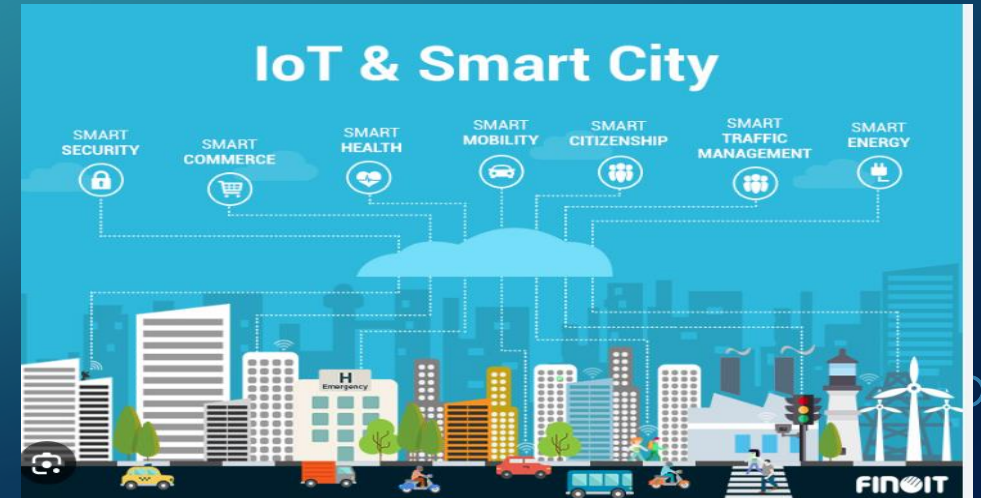


Smart Parking

- IoT sensors can be installed in parking spaces to detect when a spot is occupied and transmit that information to a central server. This data can guide drivers to available parking spots, reducing congestion and search time. The sensors embedded in the ground transmit the data to the cloud, immediately notifying the driver whenever a nearby parking spot is vacant.

Real-life application:

London (UK): The SmartPark project deployed in Westminster allows drivers to locate parking spaces on-the-go. It eliminates the hassles of time-consuming searches for a vacant spot and alleviates congestion.



THE FUTURE OF IOT AND SMART CITIES

- With its wide range of applications and benefits, IoT helps governments efficiently manage transport, infrastructure, and public services. The implementation of smart city projects results in the same outcomes of safer cities, green environments, reduced energy consumption, and optimal use of limited resources. To a great extent, these initiatives are enabled with IoT capabilities, due to which their growth and development will only accelerate in the coming years. And as more and more cities continue to leverage IoT technology globally, the more their citizens and municipalities will benefit from its use.
- We are fully equipped to build smart city initiatives that offer an enhanced experience for all ecosystem partners by harnessing IoT's pervasive connectivity, end-to-end security, and open data.

The background is a blue gradient. In the corners, there are white line art designs resembling circuit boards or neural networks, with lines and small circles.

THANKING YOU!!!