# Abstract

**College name:**

**KET's V. G. Vaze College.**

**Problem Selection:**

FINDING A CAR PARKING SPOT AT MASTEK.

# Kindly elaborate on your understanding of the problem chosen?

## a. Understanding of the Problem:

The universal challenge of finding parking, prevalent in urban areas globally, extends beyond quiet streets to complex environments like malls and IT hubs. Conventional methods involve aimless circling, causing time and fuel wastage due to uncertain space availability. The core issue lies in the intricate puzzle of navigating sprawling, multi-tiered facilities.

## b. Most Challenging Aspect of the Problem:

The most challenging aspect is the sheer scale and uncertainty of parking availability in densely populated urban settings. Factors like the number of vehicles and specific events contribute to a constantly shifting landscape. Locating a spot involves navigating through a maze of structures, where the destination remains unknown until an open space is encountered, leading to traffic congestion and environmental impact.

## c. Reason for Choosing this Problem:

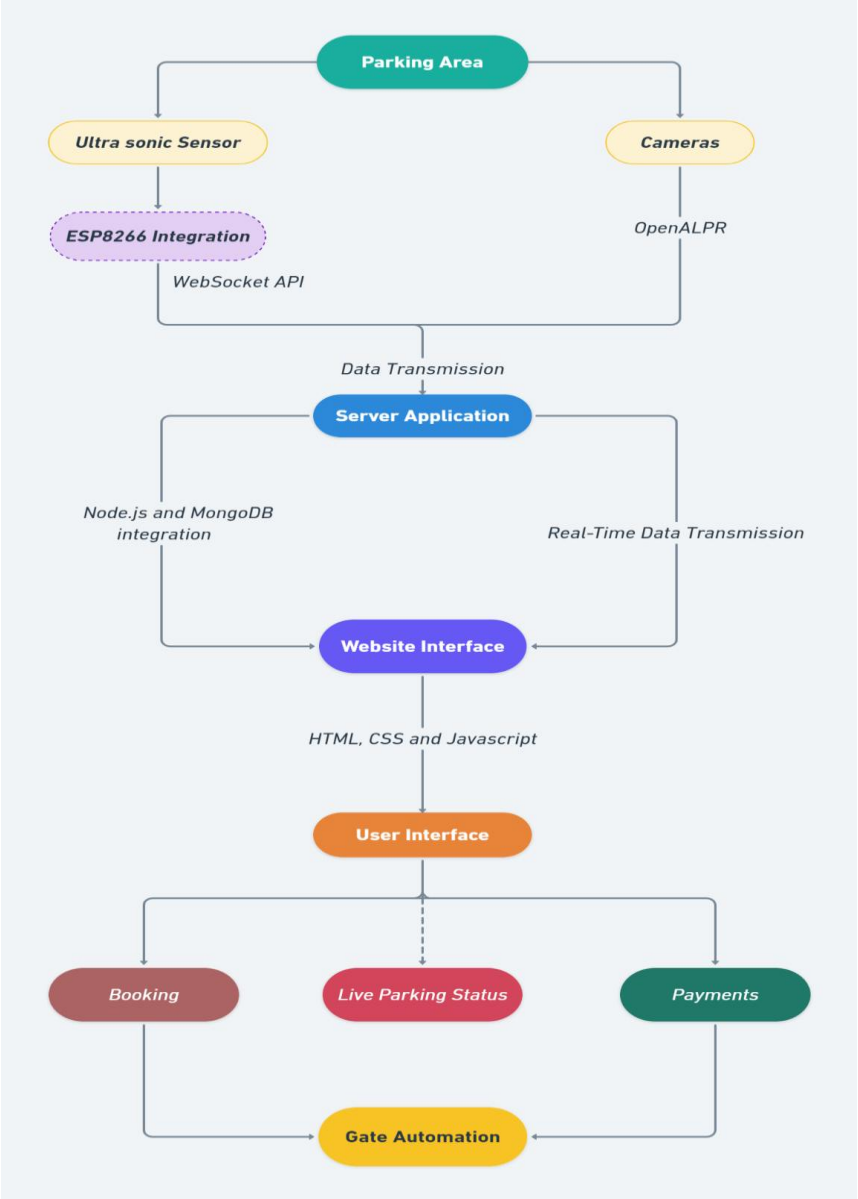
The choice to address this problem is rooted in its universal relevance and the profound impact it has on urban living. The implications stretch beyond geographical borders, affecting individuals worldwide. This issue is not just about convenience but also about resource conservation and pollution reduction. In an era where urbanization is on the rise, and environmental sustainability is paramount, resolving the parking puzzle holds the key to more efficient, less stressful urban experiences and a greener, more eco-friendly future.

# Kindly share how do you plan to approach the problem Chosen?

## a. Approach:

Our innovative solution tackles the global challenge of parking scarcity by introducing a user-friendly website equipped with real-time booking and management capabilities. This solution leverages ultrasonic sensors and IoT technology, employing ESP8266 programmed in C++ via Arduino IDE for efficient data transmission to a central server, facilitated by WebSocket API or Google Firebase. The website not only allows users to check slot availability but also incorporates features such as pre-booking , sending Notification and online payment.

## b. Approach Diagram:



c. **Platform/Coding Language/Framework:**

The website's front-end development involves HTML, CSS, and JavaScript, while Node.js and PHP powers the back-end. Online Payment can achieved using various API's like Paytm, GooglePay etc . The camera sensing functionality can be done using the OpenALPR library in Python. Programming for ESP8266 is conducted in C++ using Arduino IDE or microcontroller software. Real-time communication is facilitated by WebSocket API or Google Firebase, ensuring seamless cross-platform compatibility.

d. **Database:**

A robust database system, such as MongoDB and MYSQL, serves as the repository for critical information, encompassing parking slot status, user reservations, payment records, and vehicle number plate data captured by cameras. This comprehensive database integration enhances the functionality of the system.

e. **External Tools:**

In addition to ultrasonic sensors and ESP8266, a camera system captures vehicle number plates upon entry and exit, facilitating efficient tracking. Servo motors are employed to automate the parking area gate, enhancing security and access control.

f. **Fortnightly Targets:**

1. **Week 1-2:** Sensor setup, ESP8266 programming, and initial data transmission testing.
2. **Week 3-4:** Server application development and integration with MongoDB and MYSQL for seamless data storage.
3. **Week 5-6:** Front-end development with real-time updates, considering ESP8266 integration.
4. **Week 7-8:** Real-time data transmission implementation using WebSocket API or Google Firebase.
5. **Week 9-10:** Integration of a secure payment gateway and camera system for number plate recognition.
6. **Week 11-12:** Servo motor integration for gate automation.
7. **Week 13-14:** Final testing and user feedback.

# Why do you think your team will be able to implement a wining solution?

a. **Previous Projects Undertaken:**

As part of our experience, Our team clinched the top spot in the prestigious Mini Avishkar competition, showcasing our ability for innovative ideas. Additionally, our ongoing project involves crafting an exam committee's website for our college, highlighting our commitment to practical and impactful, solutions. These endeavors underscore our ability to conceptualize and execute inventive projects

b. **Team Strengths:**

We have a diverse team of individuals with diverse strengths. We have members who are proficient in hardware and sensor technology, software and web development, data management and user experience design. With this broad range of skills, we are able to cover all aspects of a project effectively, ensuring that a well-rounded and robust solution is provided.

c. **Team Achievements:**

Our team's collective accomplishments includes successful project executions, notably securing the first prize in the esteemed Mini Avishkar competition for our innovative idea. Additionally, our ongoing initiative in developing an exam committee's website for our college highlights our commitment to continuous learning and growth. These achievements reflect our ability to conceive inventive solutions and transform them into tangible, functional realities.

d. **Personal Motivations:**

Our team is driven by a shared passion for solving real-world problems through innovation and technology. We are motivated by the prospect of contributing meaningfully to society by addressing the challenges faced in urban environments. The desire to create a sustainable, efficient, and user-friendly parking solution fuels our dedication to this project.