Parshvanath Charitable Trust's
A. P. SHAH INSTITUTE OF TECHNOLOGY, THANE
(All Programs Accredited by NBA)
Department of Information Technology

Project Title
Smart Parking System

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Contents

1. Introduction

- Problem Identified :
  - Difficulty in finding available parking spots leads to increased congestion and wasted time for drivers.
  - Unauthorized parking in designated spots can disrupt operations and frustrate users.
- Solution Proposed :
  - Implement IoT sensors that detect parking spot occupancy and provide real-time data to a mobile application, guiding users to available spaces.

2. Problem Statement

- Limited Parking Availability: Urban areas face a significant challenge with limited parking spaces, resulting in drivers circling around in search of a spot. This not only wastes time but also contributes to increased traffic congestion and pollution.
- Inefficient Space Utilization: Many parking lots operate without real-time monitoring, leading to inefficient use of available spaces. Often, spaces remain unutilized while drivers are unaware of their availability, exacerbating the problem of parking shortages.
- Lack of Real-Time Data: Drivers often lack access to real-time data about parking space availability, leading to guesswork and uncertainty. Without this information, users face unnecessary delays and inconvenience, reducing the overall efficiency of urban mobility.

3. Objectives

1. To provide real-time information about available parking spaces to reduce the time spent searching for a spot.
2. To automate the payment process for parking reservations, making it more convenient for users.
3. To enhance user experience by offering a mobile application that allows for easy reservations and status updates.
4. To decrease traffic congestion in urban areas by optimizing parking space usage.
5. To improve overall parking management through data collection and analysis for better decision-making.

4. Scope

1. Can be applied in urban areas to optimize parking space usage, reducing the time drivers spend searching for spots and minimizing traffic congestion.
2. Can be used in commercial parking lots, shopping malls, and airports to enhance customer experience by providing real-time parking availability and easy payment options through a mobile app.
3. Can be integrated with city traffic management systems to gather data on parking patterns, helping city planners make informed decisions for future infrastructure improvements.
4. Can support electric vehicle charging stations by showing available charging spots alongside traditional parking spaces, promoting sustainable transportation options.

5. State Diagram/Workflow

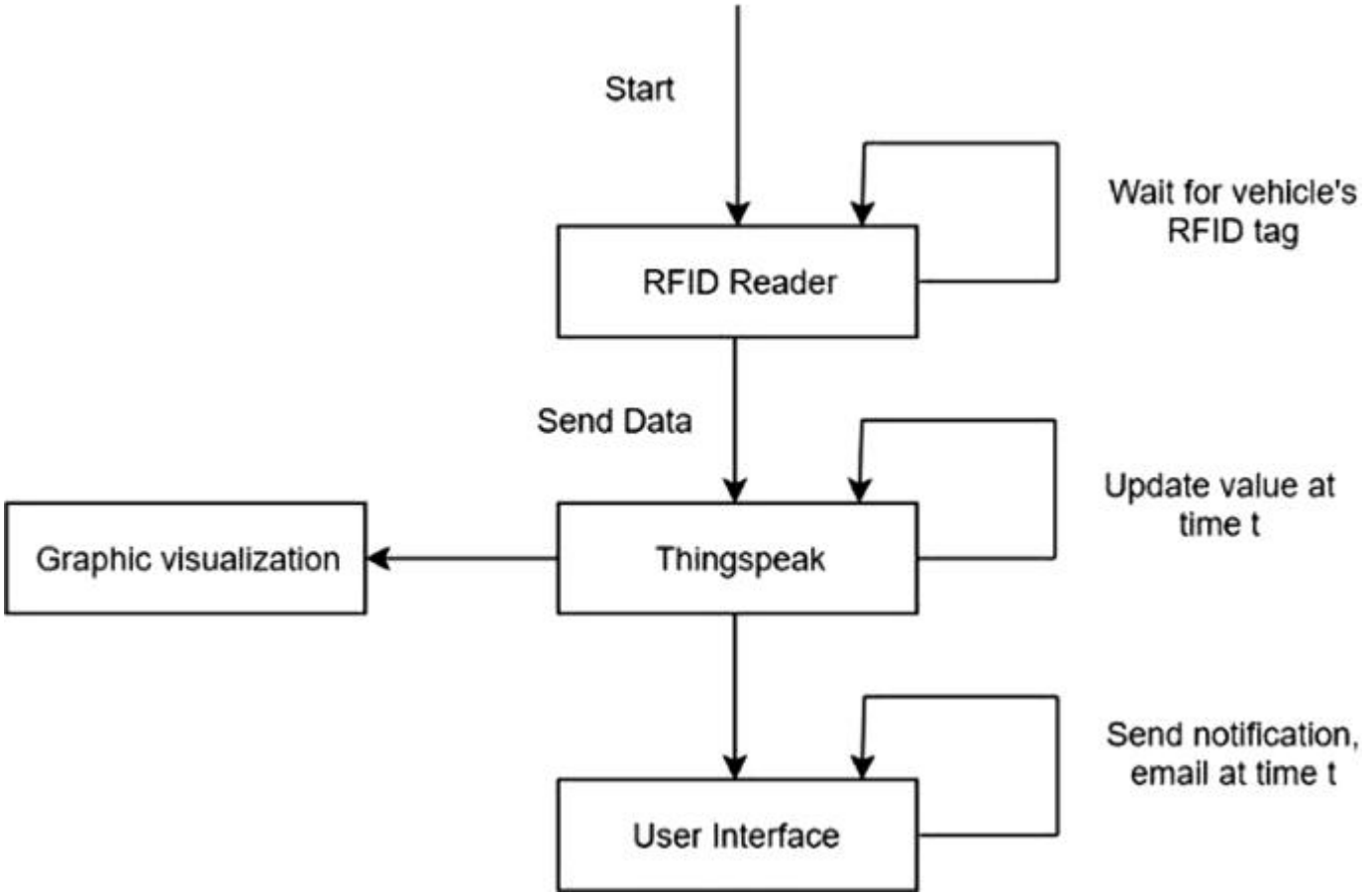

Figure 5.1: Smart Parking System

6. Circuit Diagram

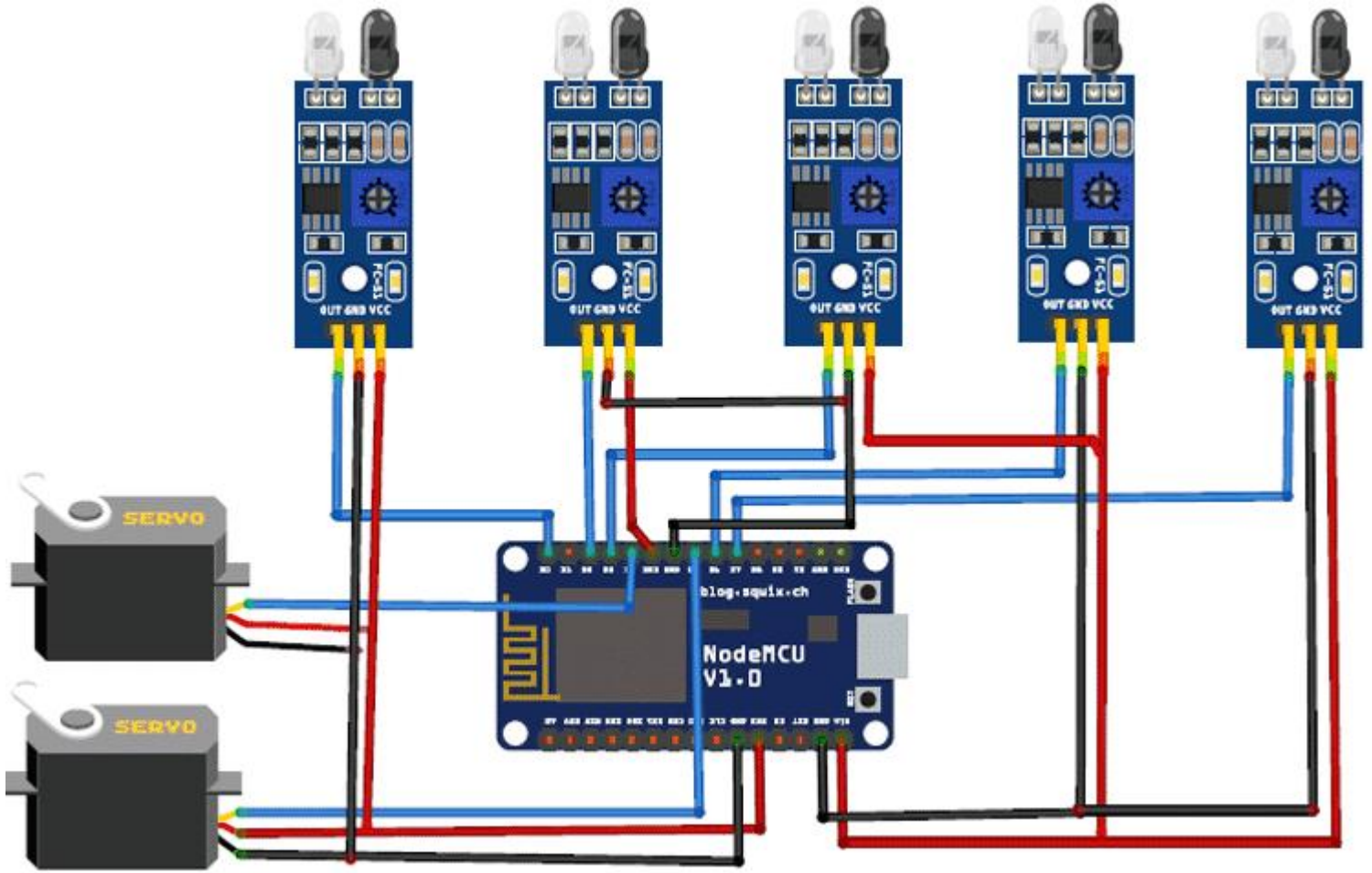

Diagram:6.1-Circuit diagram

7. Hardware and Software Requirement

- Hardware Requirements

NodeMCU ESP8266

IR Sensor (5)

Servo Motor (2)

Breadboard

Male-to-male connectors

- Software Requirements

ThingSpeak

Arduino IDE

8. Project Timeline

Sr no.	Work to be done	Duration
1.	Literature Review and Documentation	10th August to 30th August
2.	Completion of Hardware	1st September to 20th September
3.	Working on dashboard	21st September to 10th October
4.	Integration of IoT model with Website (Through HTML,CSS)	11th October 30th October

9. Conclusion

The IoT-Based Smart Parking System effectively addresses the common challenges associated with traditional parking methods, such as the difficulty in finding available spaces and inefficient payment processes. By leveraging IoT technology, this system provides real-time data on parking availability, allowing users to quickly locate and reserve spots through a mobile application.

The integration of automated payment options enhances user convenience, significantly reducing time spent searching for parking and improving overall satisfaction.

References

1. "Design and Implementation of an IoT-Based Smart Parking System",Emily Johnson, Michael Brown,Springer Journal of Ambient Intelligence and Humanized Computing, vol. 12, no. 3, pp. 345-358, 2021.

2. "A Review of IoT Technologies for Smart Parking Solutions",Sarah Lee, Robert Wang,Elsevier Transportation Research Part C: Emerging Technologies, vol. 128, pp. 12-25, 2023.

3. "Real-Time Parking Management System Using IoT",David Kim, Laura Chen,IEEE Transactions on Intelligent Transportation Systems, vol. 22, no. 4, pp. 678-689, 2022.

Thank You...!!