**Smart Parking using IOT SYSTEM**

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**Phase-5 DOCUMENT SUBMISSION (FINAL)**

## Project : Smart Parking

## IoT based smart parking system

**OBJECTIVE:**

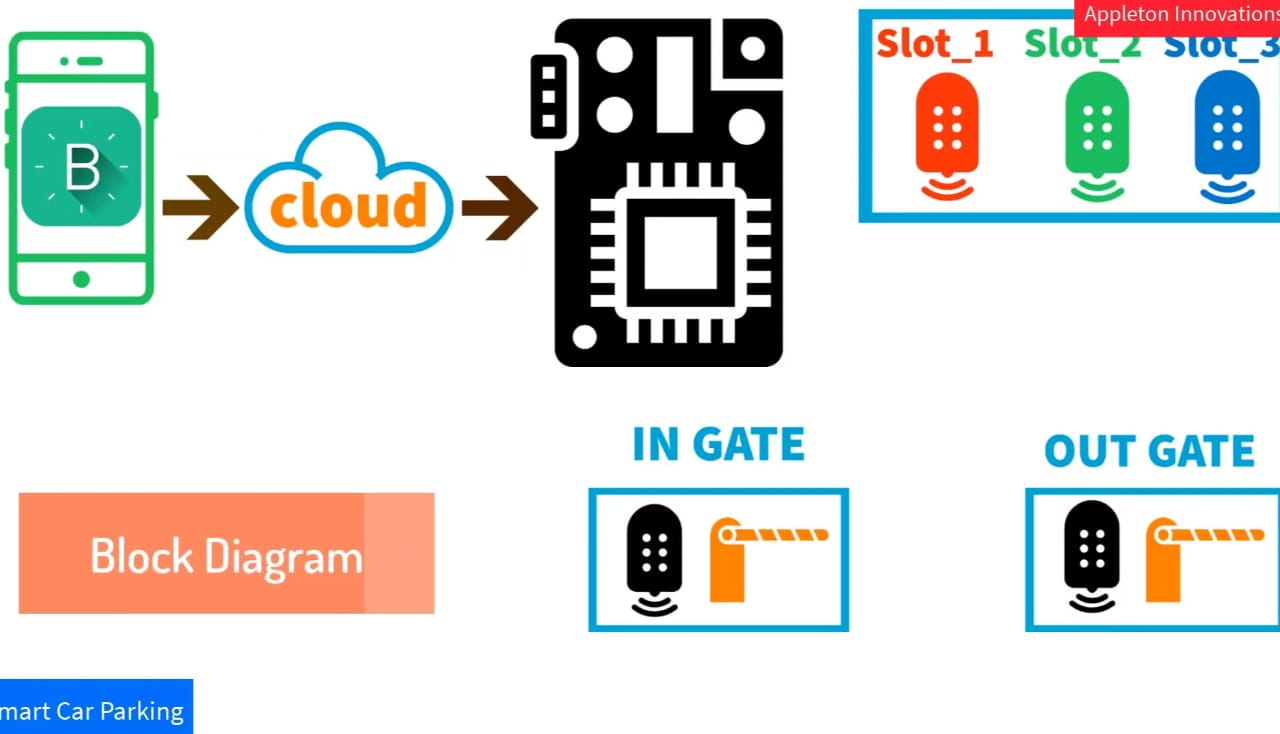
According to phase-5 guidelines, In this section you will document the complete project and prepare it for submission.

**Introduction to Smart Parking :**



Smart Parking Refers To The Use Of Advanced Technologies And Innovative Solutions To Optimize The Process Of Finding, Reserving And Paying For Parking Spaces. As Urban Areas Continue To Grow, The Demand For Parking Spaces Has Increased Significantly, Leading To Traffic Congestion ,Environmental Pollution And Over All Inefficiency In Urban Transportation Systems. Smart Parking Systems Aim To Address These Challenges By Leveraging Various Technologies To Make Parking Easier, Faster And More Convenient For Both Drivers And Parking Facility Operators.

**Block diagram :**



**Hardware requirements:**

A display board and a computer chip

Description automatically generated with medium confidenceA black circuit board with white text

Description automatically generated

A close-up of a sensor

Description automatically generatedA breadboard with holes

Description automatically generated

A black cable with a white background

Description automatically generatedA wire with wires in it

Description automatically generated with medium confidence

**Building and development of project:**

**Components required:**

1. **Bread board**

A circuit board with a screen and other electronics

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1. **IR sensor**

A person holding a small blue device

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1. **Lcd Display**

A person holding a display

Description automatically generated

1. **Node MCU**

A close up of a circuit board

Description automatically generated

1. **Servo motor**

A close-up of a hand holding a small blue device

Description automatically generated

1. **Connecting wires and USB cable**

**A close up of a cable

Description automatically generated A close-up of several colorful wires

Description automatically generated**

**Placing components on the board:**

**Initial stage**

A circuit board with a screen and other components

Description automatically generated

Take all the components for connecting in the bread board to build our project

1. **First , place the Node MCU**

A circuit board with a black microchip

Description automatically generated

1. **Place the sensors on the board**

A close-up of a circuit board

Description automatically generated

1. **Now ,connect the wires to the corresponding components**

A circuit board with wires on it

Description automatically generated

Close-up of hands working on a circuit board

Description automatically generated

A person connecting wires on a circuit board

Description automatically generated

A person holding a circuit board

Description automatically generated

1. **Finally , everything connected successfully**

A close-up of a circuit board

Description automatically generated

**Connecting NODE MCU to laptop using USB**

Hands holding wires on a circuit board

Description automatically generated

**Now the code is debugged into our Arduino using Arduino ide 1.8.13 software**

A computer screen with a message

Description automatically generated

**Coding used …….**

#define BLYNK\_PRINT Serial

#include <ESP8266WiFi.h>

#include <BlynkSimpleEsp8266.h>

#include <Servo.h>

Servo servo;

Servo servo1;char auth[] = "NvvkkwRRSxhj8LPECPSY35qRgBK1UCEN";

char ssid[] = "APPLETON";

char pass[] = "Gladys@123";

const int gateInIR = D2;

const int gateOutIR = D1;

const int slotoneIR = D4;

const int slotTwoIR = D5;

const int slotThreeIR = D3;

int total = 0;

int IR1 = 1;

int IR2 = 1;

int IR3 = 1;

BlynkTimer timer:

WidgetLCD lcd (V1);

void setup() {

Serial.begin(9600) I

Blynk.begin (auth, ssid, pass);

pinMode (gateInIR, INPUT);

pinMode (gateOutIR, INPUT);

pinMode(slotoneIR, INPUT);

pinMode (slotTwoIR, INPUT);

pinMode(slotThreeIR, INPUT);

servo.attach (D7);

servol.attach (D8);

timer.setInterval (10000L, carParking);

**FINAL OUTPUT:**

A finger pointing at a screen

Description automatically generated

A hand holding a small screen

Description automatically generated with medium confidence

* We made this simple parking system only for 3 cars to be parked.

Here ,initially 3 Slots available which denotes space for parking

A= AVAILABLE

NA=NOT AVAILABLE

Assume each sensor carrying a parking space.

**OUTPUT AFTER SOME TESTING:**

A hand holding a phone

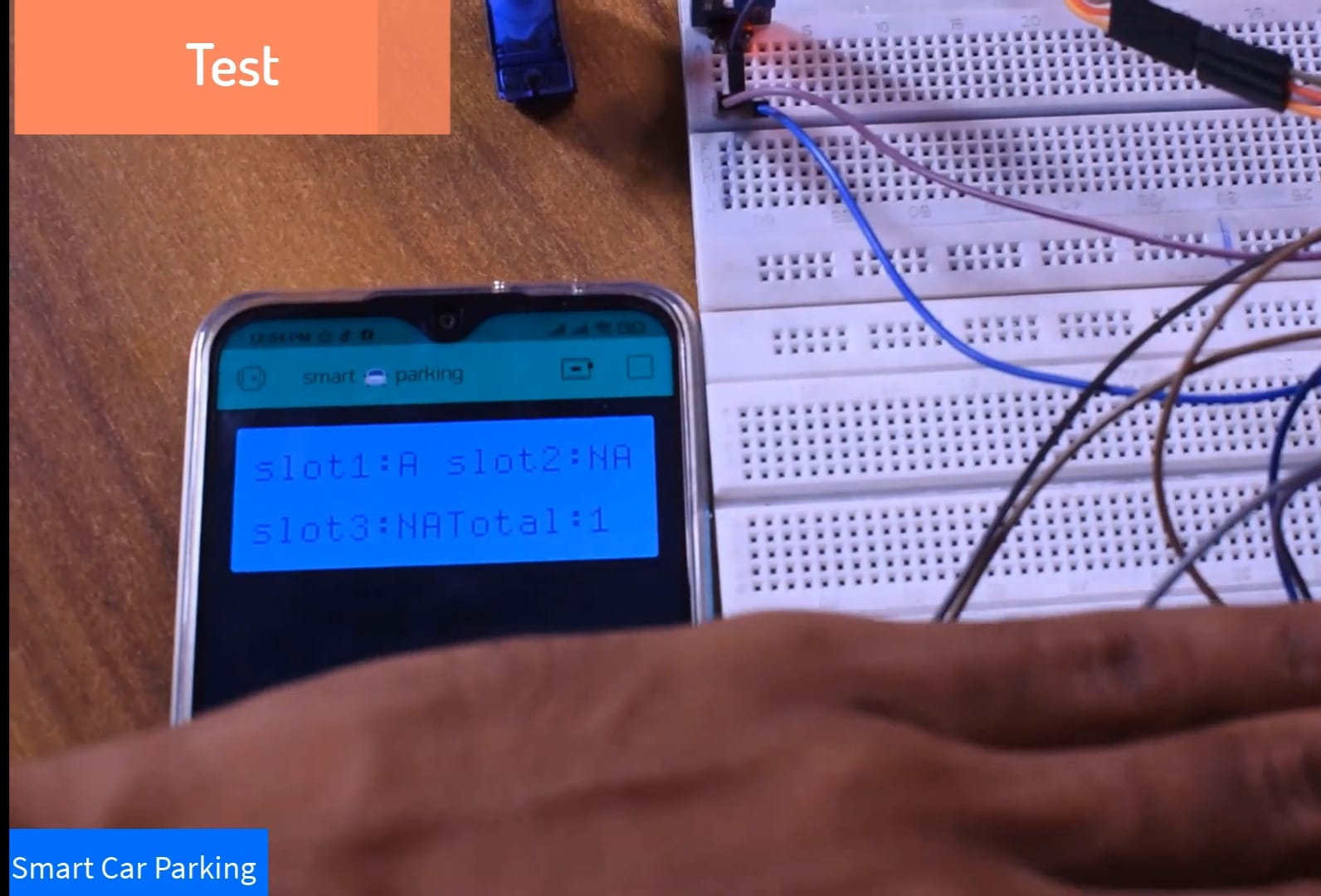
Description automatically generated

**when the car reaches the sensor 3 which is slot C. Now we got an display**

TOTAL SLOTS AVAILABLE :2

SLOT 3 : NA

**when 2 cars came , Our output will be….**



A small electronic device with wires

Description automatically generated

**when 3 cars came , Our output will be….**

A cellphone with a blue screen and wires

Description automatically generated

**Need for smart parking:**

Aerial view of a road with cars and a circular object

Description automatically generated

Aerial view of a parking lot

Description automatically generated

Aerial view of a parking lot

Description automatically generated

**SPECIFICATIONS :**

* Servo motor is provided for automatic gate opening and closing purpose.

A person using a piece of paper to make a robot

Description automatically generated

A hand holding a piece of paper

Description automatically generated

A person holding a small blue object

Description automatically generated

* Sensors are provided for sensing the parking space availability in parking lots and also for sensing cars in gate terminals.

A hand holding a piece of paper

Description automatically generated

* lcd display is provided for displaying the parking space availability

A small electronic device with a screen

Description automatically generated

* Mobile applications are provided for checking the parking space availability from anywhere at anytime.

Several small electronic devices

Description automatically generated with medium confidence

* Screenshot when parking space is full

A cell phone with a screen on it

Description automatically generated

**Advantages of smart parking system :**

* Optimized parking.
* Reduced traffic.
* Reduced pollution.
* Enhanced User Experience.
* Integrated Payments and POS.
* Increased Safety.
* Real-Time Data and Trend Insight.
* Decreased Management Costs.

**Final project:**



**Conclusion:**

By integrating these modules, the Smart Parking system using IoT offers a comprehensive solution to address the challenges of urban parking, leading to improved efficiency, reduced environmental impact, and enhanced user satisfaction.

**Future scope:**

Using the slot allocation method we can book our own cheapest parking slot.

