Elevator System Using IOT

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ABSTRACT: Elevator has over the time become an important part ofour day to day life. It is used as an everyday transport device useful to move goods as well as persons. In modern world, cities and crowded areas require multi- floor buildings. The main purpose of this project is to operate the elevator by voice command. Therefore, we have decided to come up with a new idea, which is fascinating as well as helpful. We have tried to develop an elevator system that accepts the destination input via bluetooth and taking the elevator to the destination accordingly. Speech recognition is the method by which the elevator can be controlled using voice. Speech recognition is a technology in which the system will understand the words but not the meaning of words. Speech is the best and ideal method to control the elevator. The main objective of the proposed system are: Voice-based command operation of the elevator Voice- based operation of a device in the lift To avoid physical contact with the elevator.

I. INTRODUCTION

Elevator systems are essential for modern infrastructure, and integrating IoT and Bluetooth technology transforms them into smarter, more efficient solutions. IoT enables real-time monitoring, predictive maintenance, and energy optimization, while bluetooth allows users to control elevator via smartphones or wearable devices, enhancing convenience and hygiene.

This integration also offers improved safety through advanced features such as remote fault detection, automatic emergency alerts, and real-time status updates, Bluetooth functionality, on the other hand, enables seamless user identification, allowing personalized access control and touchless operation. As buildings become smarter, Iot and Bluetooth-driven elevators contribute to sustainability, cost-effectiveness, and enhanced user satisfaction.

II. LITERATURE SURVEY

The integration of Internet of Things (IoT) technology in elevator systems has garnered significant attention in recent years [1]. Researchers have explored various aspects, including predictive maintenance [2], [3], energy efficiency optimization [4], and smart destination control [5]. Studies have demonstrated notable improvements in operational efficiency, safety, and user experience [6], [7]. However, challenges persist, particularly regarding data security [8], interoperability [9], and scalability [10]. Notably, AI- powered predictive maintenance has shown promising results [11]. This literature survey synthesizes existing research, identifying gaps and areas for further investigation to advance the development of IoT-enabled elevator systems.

III. PROPOSED SYSTEM

Our IoT-based elevator system uses sensors (for weight, motion, proximity), microcontrollers, and internet connectivity to improve operations. It enables real-time monitoring, predictive maintenance, optimized traffic flow, and safety enhancements. Data is sent to the cloud.

ADVANTAGES OF PROPOSED SYSTEM

- Real-time Monitoring and Alerts:
- Predictive Maintenance:
- Energy Efficiency:
- Enhanced Safety:
- Improved User Experience:
- Traffic Optimization:

IV. METHODOLOGY

The methodology for our IoT-based elevator system starts with analyzing the requirements, such as real-time monitoring and safety features, while identifying the necessary components like sensors, controllers, and cloud platforms. We then design the hardware, integrating sensors and microcontrollers, and establish connectivity using Wi-Fi

or cellular networks. Next, we focus on software development to enable data monitoring and analytics.

After testing the system for functionality and safety, we integrate it with smart building systems. Finally, we deploy the solution and ensure regular maintenance for reliable operation

A. DESIGN

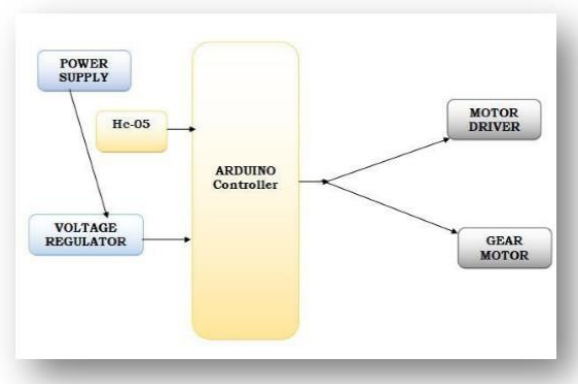

Fig 1. Design

B. HARDWARE IMPLEMENTATION

POWER SUPPLY: All digital circuits require regulated power supply

VOLTAGE REGULATOR: A Voltage regulator is a device which converts varying input voltage into a constant regulated output voltage.

BLUETOOTH(Hc-05): Bluetooth operates at frequencies between 2402 and 2480 MHz, or 2400 and 2483.5 MHz including guard bands 2 MHz wide at the bottom end and 3.5 MHz wide at the top.

ARDUINO CONTROLLER: Arduino is an open source microcontroller which can be easily programmed, erased and reprogrammed at any instant of time

MOTOR DRIVER: L293D is a typical Motor driver or Motor Driver IC which allows DC motor to drive on either direction. L293D is a 16-pin IC which can control a set of two DC motors simultaneously in any direction.

GEAR MOTOR: Gear motors are complete motive force systems consisting of an electric motor and a reduction gear train integrated into one easy-to- mount and -configure package.

C. FLOWCHART WORKING

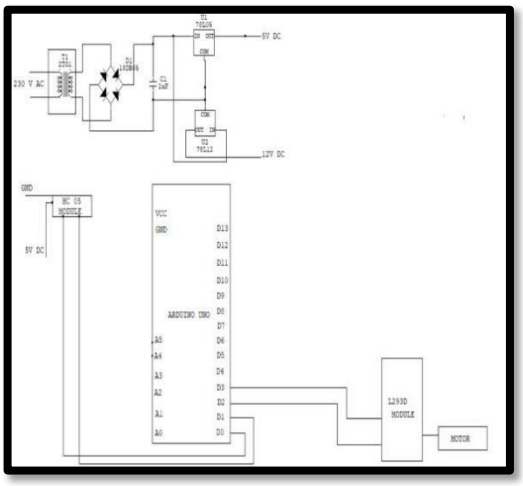

Fig 2. Circuit Diagram

D.SOFTWARE IMPLEMENTATION

These are the steps you need to follow in order to be up and running:

1. Get an Arduino board
2. Download the Arduino environment
3. Install the USB drivers
4. Connect the board
5. Upload a program

SOURCE CODE

```
digitalWrite(MOTOR_IN1, LOW);
digitalWrite(MOTOR_IN2, HIGH);
}
// Simulate elevator movement (adjust delay as needed) delay(1500); // Adjust based on motor speed and distance between
floors
// Stop the motor digitalWrite(MOTOR_IN1, LOW);
digitalWrite(MOTOR_IN2, LOW);
// Update current floor currentFloor = targetFloor;
// Report current floor to Serial monitor (optional)
Serial.print("Current Floor:
");Serial.println(currentFloor);
}#include <SoftwareSerial.h>
// Define Bluetooth pins
#define BT_RX 2 // Bluetooth RX pin #define
BT_TX 3 // Bluetooth TX pin

// Define motor control pins
#define MOTOR_IN1 4 // Motor driver input pin 1
#define MOTOR_IN2 5 // Motor driver input pin 2
// Global variables
int currentFloor = 1; // Current floor initialized to floor 1 void setup() {
// Initialize serial communication Serial.begin(9600);
```

```
BTSerial.begin(9600);
// Motor control pins setup pinMode(MOTOR_IN1,
OUTPUT); pinMode(MOTOR_IN2, OUTPUT);
// Initialize motor stopped
digitalWrite(MOTOR_IN1, LOW);
digitalWrite(MOTOR_IN2, LOW);
}
void loop() {
// Process commands based on Bluetooth input switch
(command) {
case '1':
goToFloor(1); break;
case '2':
goToFloor(2); break;
case '3':
goToFloor(3); break;   default:
break;
}
}
}
void goToFloor(int targetFloor) { if (targetFloor ==
currentFloor) {
// Already at the target floor, do nothing return;
}
// Determine direction to move the motor if
(targetFloor > currentFloor) {
// Move motor up digitalWrite(MOTOR_IN1, HIGH);
digitalWrite(MOTOR_IN2, LOW);
} else {
// Move motor down
```

V. EXPERIMENTAL RESULTS

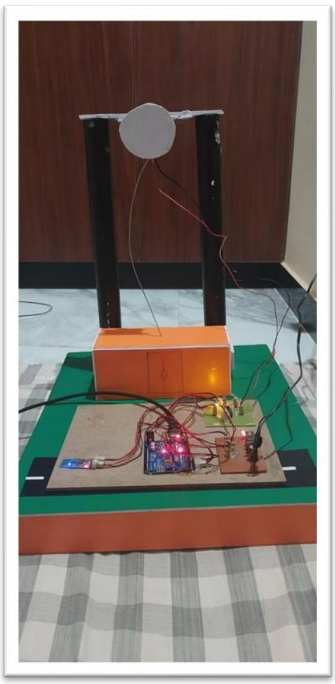

Fig 3. Result

VI. FUTURE SCOPE

The future of elevator systems will be shaped by IoT innovations, enhancing safety, efficiency, and convenience. Predictive maintenance, biometric authentication, and real-time surveillance will ensure secure and reliable operations. Smart destination control, voice assistants, and mobile app integration will streamline user experience. Energy harvesting, smart energy management, and green technologies will minimize environmental impact. Integration with building automation systems, AI, and blockchain will create intelligent, sustainable, and connected buildings. As IoT advancements continue, elevator systems will transform into seamless, efficient, and personalized mobility solutions.

VII. CONCLUSION

In conclusion, the seamless integration of Internet of Things (IoT) technology into elevator systems has unveiled a transformative landscape, markedly enhancing safety, efficiency, convenience, and sustainability. The myriad benefits encompass predictive maintenance, smart destination control, energy optimization, and real-time monitoring, collectively redefining the vertical transportation experience. However, addressing pivotal challenges such as data security, interoperability, and scalability remains imperative to harness the full potential of IoT-enabled elevators. By embracing industry standards, investing in cutting-edge data analytics and artificial intelligence, and prioritizing robust cybersecurity measures, the elevator industry can create a more efficient, secure, and connected future. Ultimately, the advent of IoT-based elevator systems will revolutionize building management, fostering smarter, safer, and more sustainable environments that cater to the evolving needs of occupants

VIII. REFERENCES

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