ADVANCED SPEED CONTROL OF DC MOTOR USING IOT

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Abstract : Advanced speed control of DC motor using IOT these project is remote motor monitoring system which controls the speed of motor and change the direction of motor. This project is presented by using Internet Of Things (IOT) Technology. And IOT platform (Blank IOT application). System consists of ESP 8266 microcontroller which is WIFI enabled with pulse width modulation (PWM). These system improves automation, efficiency and flexibility.
DC motor plays an important role in automation. Advanced speed control of dc motor using IOT project presents an concept of remotely speed control of DC motor using IOT system from any remote location. These system consists a microcontroller NodeMCU (ESP8266), motor driver(L298), DC motor,Battery (7-12 Volt),Blynk IOT application.This IoT-based system improves flexibility, reduced physical presence of human and also improves efficiency. This project is useful in industrial automation, robotics. The system controls speed and direction of motor using mobile application or web interface.

IndexTerms **- IOT technology , speed control, real time monitoring, automation**

INTRODUCTION

Speed control of motor is important in electrical engineering and automation. With the help of the Internet of Things, traditional control methods are replaced by automatic control system that offer remote access and real-time monitoring.In these 21st century , internet, Mobile plays an vital role and to control speed of motor and direction from remote locations has become desirable. These technology with the Blynk mobile application enabling users to monitor and adjust the speed and direction of DC motors from remote location. This system is real time monitoring to avoid traditional methods Advanced speed control of DC motors using the IOT is useful system to reduce physical presence of human and to control the speed of motor from remote location. By using IoT concept withPulse Width Modulation (PWM) techniques, these systems is real-time monitoring and speed regulation of motors from any remote location.

II. LITERATURE REVIEW

Speed control of motor plays vital role in electrical areas, specially with advanced and automatic systems. Traditional motor control systems requires physical presence of user which lacked flexibility and real-time monitoring capabilities. Actually GSM based systems are available for remote location operation. But these system suffers communication delays for some time . So GSM based system shifted to Internet Of Things (IOT) based speed control system. These systems provide advantages such as continuous data transmission, and user-friendly interfaces via mobile or web applications.These system improves reliability, efficiency, it is real time monitoring system, and it reduces physical presence of human.

III. RESEARCH METHODOLOGY

The methodology for advanced speed control of a DC motor using IoT involes DC motor, motor driver, microcontroller, if I module and IOT platform for adjustmentof speed from remote location.Advanced systems use Pulse Width Modulation (PWM) for real-time speed regulation by using Blynk IOT mobile application.
When command is given through mobile application by user it send to microcontroller through IOT platform. Microcontroller processes and generates PWM signal. And sends it to motor driver circuit. The DC motor is connected to an L298N motor driver. The driver interfaces with the ESP8266, which generates PWM signals to control speed and change the motor direction.

System Design :
Design an IoT-based system using ESP8266, motor driver, and sensors.
Define input (user command) and output (motor speed).

Hardware Setup :
Connect microcontroller to motor driver (L298N).
Connect DC motor to driver.

Interface speed sensor (IR/Hall sensor).
Ensure proper power supply and common ground.

Software Development :
Program ESP8266 using Arduino.
Implement PWM signal generation for speed control.
Configure Wi-Fi connectivity.
Integrate IoT platform (Blynk IOT application).

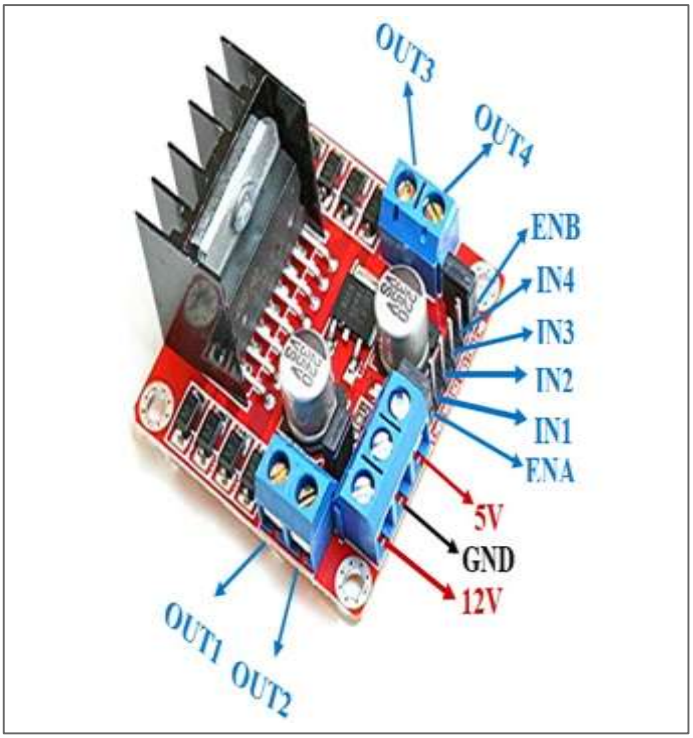
IoT Integration :
Create dashboard on IoT platform.
Add controls (slider for speed, ON/OFF button).
Connect ESP8266 to cloud server.

Data Communication :
User sends command via mobile app.
Command transmitted via internet to ESP8266.
ESP8266 processes input and adjusts PWM output.

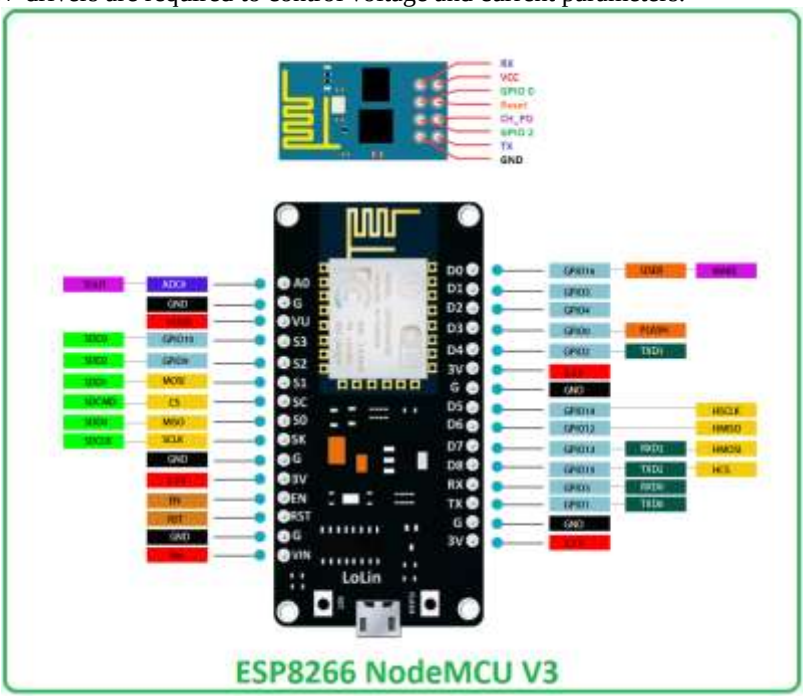
Motor Control :
PWM signal controls motor speed through driver.
Direction control using IN1 and IN2 pins.

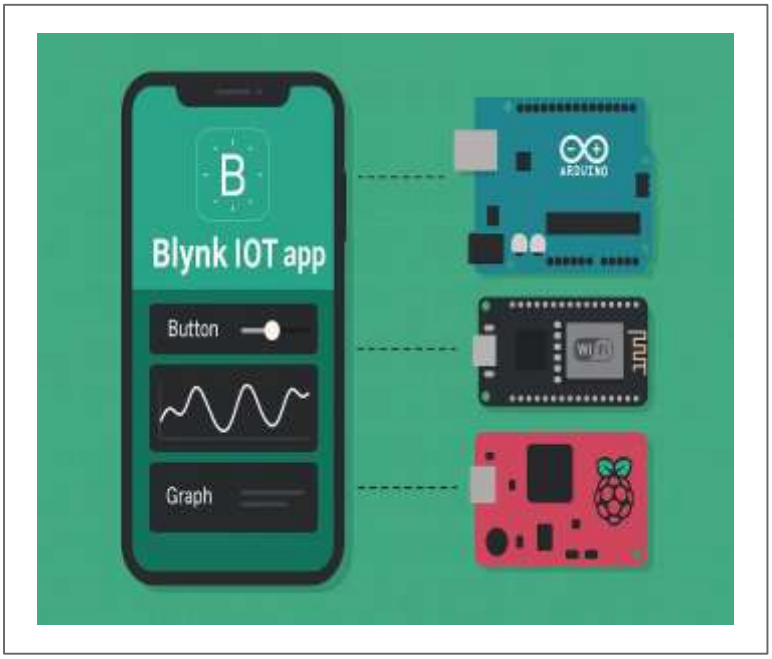
3.1 Main Components of these system :

3.1.1 Microcontroller : ESP8266 or NodeMCU is used to receive control signals using WiFi module.



3.1.2 Motor Driver: L298N drivers are required to control voltage and current parameters.

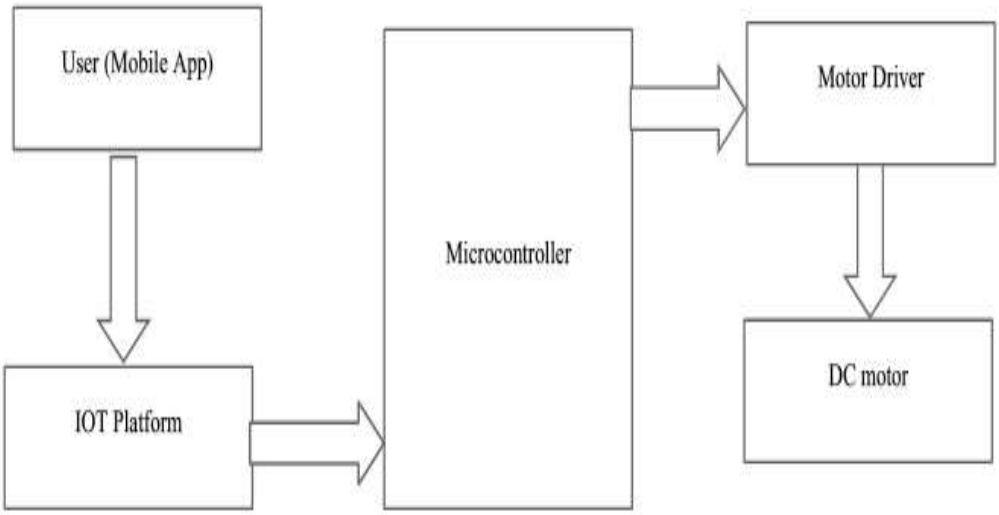




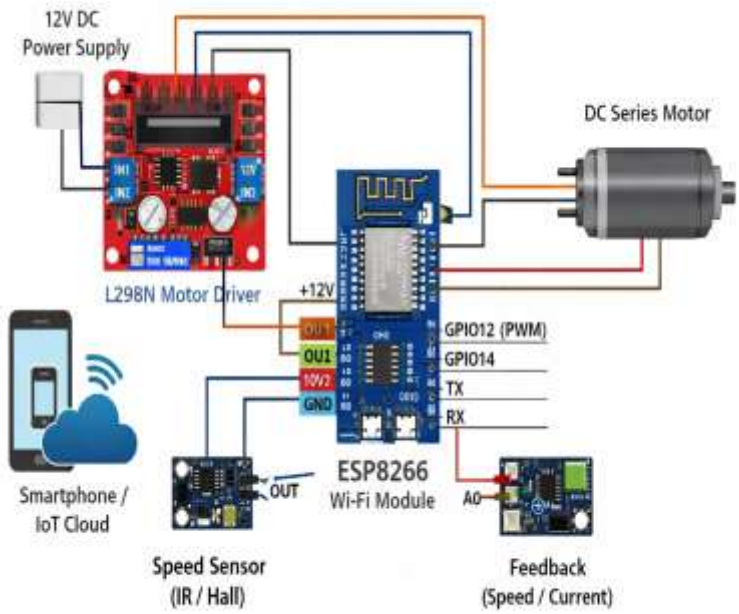
3.1.3 IoT Platform: Blynk application is commonly used for sending commands to control speed of motor.

3.1.4 DC motor :

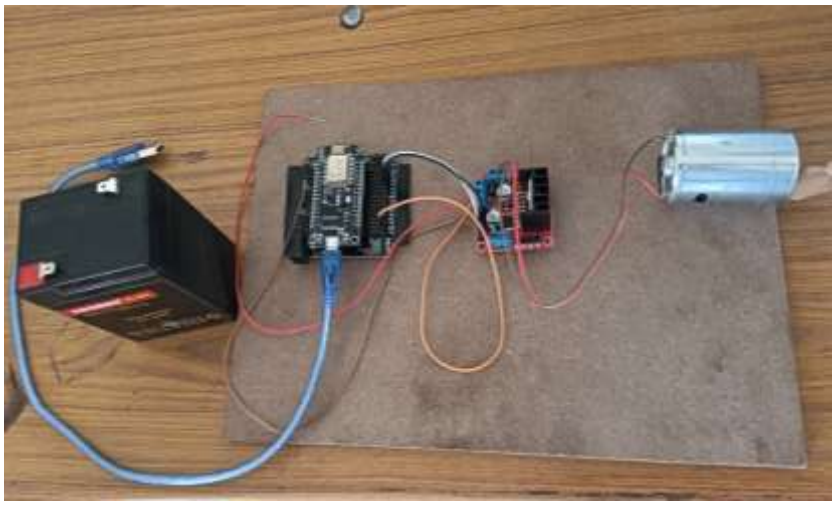
3.1.5 Battery :



3.2 Block Diagram :



3.3 Circuit Diagram :



3.4 Working Model

IV. APPLICATIONS

[1] Industrial automation
[2] Smart irrigation
[3] Electric vehicles
[4] Home automation
[5] Robotics
[6] HVAC systems

V. CONCLUSION AND FUTURE SCOPE

5.1 Future Scope

Using speed control of DC motor using IOT technique we can control simple remote operation to autonomous, intelligent systems.
[1] Integration with Al and Machine Learning
[2] Cloud-based analytics
[3] Fully autonomous motor control systems
[4] Integration with smart grids

5.2 Conclusion

The Advanced speed control of DC motor s an efficient method for controlling the speed of a DC motor using IoT . By using Wi-Fi-enabled microcontroller and motor driver circuit. Tese system is real time monitoring and efficient system compared to traditional systemIOT based system is flexible, efficient and easy to operate. There is no need to present physically to operate the motor. Overall, this system is user friendly, easy to operate, flexible, cost effective

VI. REFERENCES

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