ISSN No:-2456-2165

Adaptive Traffic Control

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Abstract:- With the rapid rise of the population, monitoring and controlling traffic congestion has become a major concern. Increased vehicle numbers cause numerous issues, including time and fuel waste, air, and sound pollution, and even fatality from trapped emergency vehicles. The Internet of Things (IoT) and data analytics are used in this research to create a real-time traffic management system (TMS). The traffic density is measured using pressure sensors. After evaluating sensor data, the system controller uses a traffic management algorithm to set traffic signal time and uploads data to a cloud server via a Wi-Fi module. The proposed technology may foresee potential traffic congestion at the intersection. If an emergency vehicle is spotted, it will be given precedence, which means it will have a longer signal length to pass through the junction.If an emergency vehicle is spotted, it will be given precedence, which means it will have a longer signal length to pass through the junction. When a car violates a traffic signal, the system may identify it and impose a fine, which can be paid through the Traffic Wallet smartphone app. This proposed solution is cost-effective, easy to install, and maintain.

I. INTRODUCTION

Each person in the current period has a variety of modes of transportation, resulting in an increasing number of automobiles. To avoid traffic bottlenecks and accidents, traffic lights are essential. The primary concept behind the design is to prevent car crashes by sending suitable signals in different directions for a short time, after which the next waiting motorist would be treated similarly. A cycle will be formed to manage the flow in this manner. Traffic control devices are markers, signs, and signaling devices that are used to advise pedestrians, motor vehicle drivers, and motorists about traffic instructions and control. bicycle. These devices are usually found adjacent to, above, or along highways, roads, cars, and other public areas where traffic control is necessary.With inhabitants' rising purchasing capacity and the pleasure, it provides, traffic management is one of the most pressing concerns facing all cities. In 1951, 306 new vehicles were registered in India; in 1975, 2472 were registered; in 2000, 48857 were registered; and in 2011, 141866 were registered. As a result, the number of tanks grows at an exponential rate. To control traffic flow, traffic lights are utilized. Transportation has become as crucial to the logistics sector as it is to ordinary people in recent years. As a result, the number of cars on the road increases. As a result, traffic bottlenecks and accidents are typical in all crowded cities.At traffic intersections where cars may turn in their direction, traffic lights give a simple, inexpensive, automatic, and affordable solution.

II. LITREATURE REVIEW

J.P. Knight, a railway engineer, placed the first traffic lights in front of the British Parliament in London on December 10, 1868. They had semaphore arms and red and green gas lights for nighttime use, like railroad signals at the time. A lever in the base rotates the gas light so that the appropriate light is facing traffic. It was unfortunately commissioned on January 2, 1869, wounding the officer in charge. [1] The current electric traffic signal is a product of the United States. Lester Wire, a police officer in Salt Lake City, Utah, designed the police car in 1912.The first red-green electric light. On the corner of East 105th Street and Euclid Avenue in Cleveland, Ohio, the American Traffic Signal Company constructed a traffic signal system on August 5, 1914. It had two colors, red and green, as well as a buzzer based on James Hoge's design. Provide a color change warning. In the event of an emergency, police and fire stations could manage the signals according to James Hoge's idea. In 1920, police officer William Potts in Detroit [1], Michigan, invented the first four-way, three-color traffic light. Garrett Morgan developed a traffic light device in 1923.Morgan's creation of a traffic signal mechanism was inspired by his experience driving down Cleveland's street. The oldest operating traffic light in the United States is said to be in Ashville, Ohio, where it was utilized at a public

ISSN No:-2456-2165

road intersection until 1982, when it was moved to a local museum. In 1917, Salt Lake City established the first interconnected traffic signal system, with six connected junctions operated concurrently by a manual switch. In Houston, Texas, automatic control of interconnected traffic lights was first used in March 1922. In Wolverhampton, England, the first automatic experimental traffic signals were installed in 1927. Traffic management has been one of the most difficult tasks in modernization during the last few decades. The researchers have arrived.It will take a long time to resolve the traffic problem.

III. PROPOSED MEDTHODOLOGY

A Wi-Fi receiver is required to connect the system to the Internet. In my situation, I utilized a connected ESP8266 with a built-in NodeMCU board to run firmware on the ESP8266.Low-level computer control software is known as firmware. To inform NodeMCU what to do, I want to develop a four-channel relay utilizing the Blynk mobile app and Arduino Integrated Development Environment (IDE).

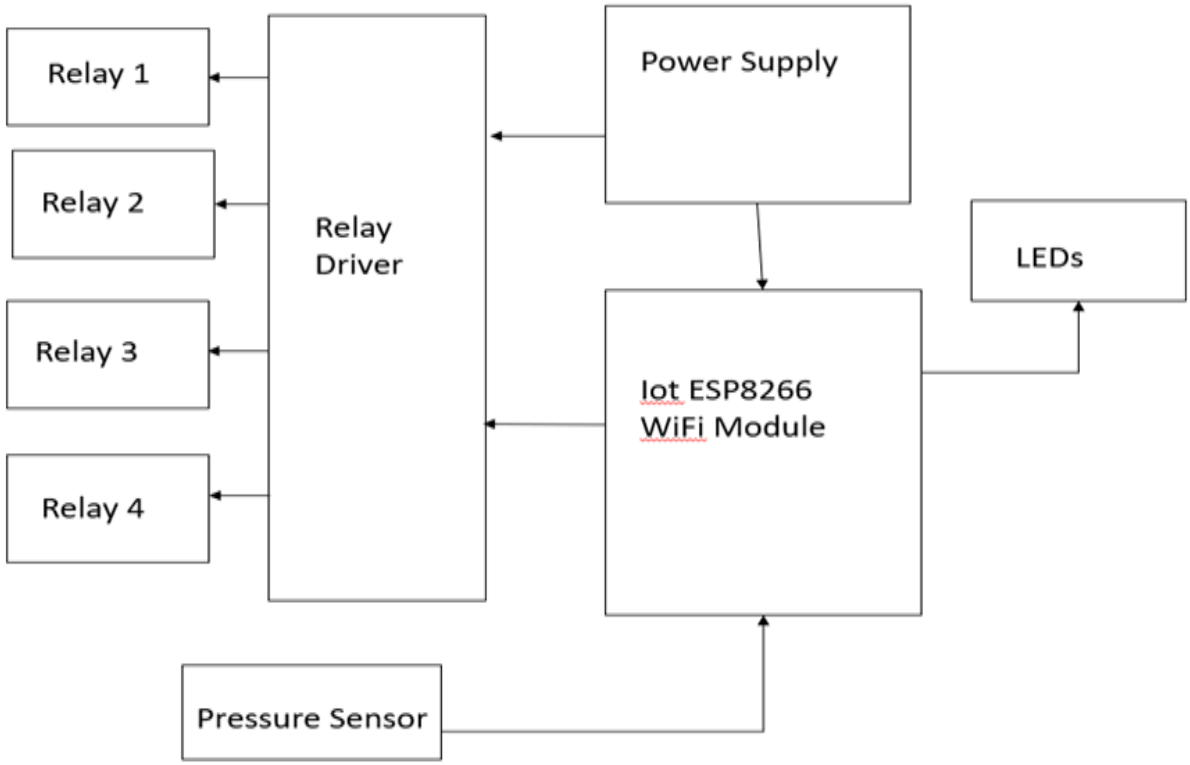

Fig. 3.1 System block diagram

IV. RESULT

Several aspects of IoT hardware components are used to produce adaptive traffic control. Traffic optimization is carried out using an IoT platform to make effective use of variable time allocation for all traffic lights based on the number of vehicles on the road. To efficiently tackle the problem of traffic congestion and perform rerouting at road crossings, an intelligent traffic management system is installed. This research proposes an effective answer to the fast-expanding traffic volume, particularly in large cities, which is increasing day by day, and traditional systems have significant limits in terms of properly handling existing traffic.

Figure 4.1: Red stop light

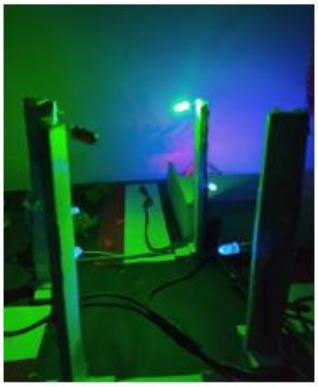

Figure 4.2: Green Light for Go

Figure 4.3: Orange light when VIP passes

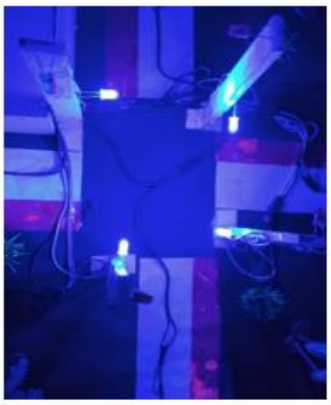

Figure 4.4: Blue Light when amublance passes

V. CONCLUSION

An intelligent traffic management system is presented to regulate road traffic situations more efficiently and effectively, considering the advanced approach of the traffic management system. It dynamically regulates traffic flow and modifies signal timing based on curbside traffic density by interacting with a local server more effectively than ever before. Because the system operates even if the local or centralized server fails, the decentralized approach makes it more optimized and efficient. The system also gives essential data to higher authorities for use in road design, allowing for the most efficient use of resources.

REFERENCES

[1.] Babu, P.R.K.S.M. R. (2016). Real-time intelligent traffic management system for smart cities using internet of things and big data. 2016 International Conference on Emerging Technology Trends (ICETT)
[2.] T.K. A.D. Jadhav, Bhor Madhuri, "Intelligent Traffic Light Control System", 4th IRF
[3.] International Conference, ISBN: 9789382702665
[4.] Takuya Miyazaki, Yukhi Kitazono and Manabu Shimakawa, "Emergency Siren Detector use FFT on dsPIC". Proceedings of the 1st IEEE/IIAE International Conference on Intelligent Systems and Image Processing 2013.
[5.] Griffith, P. (2005, February). Design a switching voltage regulator with the TL494.