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SMART TRAFFIC MANAGEMENT SYSTEM USING IOT

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Abstract— **The book provides a summary of the ongoing issue of traffic congestion in numerous Indian cities. India's biggest issues with traffic congestion are primarily related to one or more of the following, such as poor traffic management practices, insufficient law enforcement, and signal failures. There shouldn't be any traffic jams because it greatly slows the speed of freight vehicles, lengthens lines at checkpoints and toll booths, costs untold numbers of productive man-hours in lost travel time, and causes physical and emotional exhaustion in people. Aside from that, the vehicles stuck traffic problems results roughly 40% higher pollution than individuals who regularly travel on roadways by way of additional fuel is consumed and therefore causing far to much carbon dioxide emissions, which would necessitate periodic maintenance. Our trials based on current data show that the suggested strategy can shorten the consumer's travel and waiting times. To address the sub risks to humanity, we devised a technical workaround employing IoT.**

Keywords— **Traffic, Congestion, Travel, Waiting time.**

I.INTRODUCTION

Most of the time, there is uneven traffic coming from all directions to a junction. Most countries regulate traffic using fixed-time signals, however some developed countries' largest cities use centralized management systems to manage traffic. Events that are unpredictable but frequently occur, such as accidents, vehicle problems, and ill timed signalized intersections, special occasions like massive social gatherings and political rallies, bad weather, etc. are all variables that contribute to numerous types of traffic capacity problems. On the other hand, macro level factors, such as trends in property use, profiles of employment, trends of income, trends of vehicle ownership, designs of infrastructure investment, trends of regional economic factors, etc., may indeed lead to congestion. Traffic management systems have used the Internet of Things (IoT) concept. In this framework, we are putting forth a potent method by which radio wave flagging tactic can be used to identify these cars. The crisis cars will be identified and incorporated in a system that emits a Sensor Observation Service (SOS) signal. A sign detection unit can detect this signal, and it will then send a crisis trigger to the traffic executive's system. The criticism and the methodology presented could be handy for analogous developing nations.

II.LITERATURE SURVEY

In [1] the Authors Gustav Nilsson, Giacomo Como presented a system in which the use of Advanced Traffic Management System (ATMS) can minimize traffic congestion, with the issues on the research route being identified after data collection and the execution of a roadside discussion, a spot speed analysis, and a vehicular traffic study. The volume/capacity ratio can be calculated using traffic volume studies at intersections, and roadside interviews throughout the study route provided information on the actual traffic-related issues. By implementing an Advanced Traffic Management System, an intersection's Quality of service and ability (LOS) can be improved (ATMS).Mudassar Khalil and Abida Sharif outlines a low-cost future STS that would use traffic rapid updates to deliver better service. The Internet of Things (IOT) is used to instantly collect and distribute public traffic data for data processing. Predictive analytics can be used to monitor traffic density and offer remedies utilizing a variety of analytical texts.

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In [2] The authors M.N.V.M. Sai Teja, N. LasyaSree, Lasya Harshitha, and P. Venkata Bhargav have suggested a system in which the green signal is typically triggered for a comparable time span on two lines without taking traffic load into consideration, stretching the wait for vehicles in other lanes. In order to solve many of these issues caused by traffic congestion, we developed an algorithm that can shorten wait times by anticipating the amount of vehicles and adjusting the signal accordingly.

In [3] Authors P Indhiradevi, P Saravana kumar, R Varsha, S Sahithya have suggested a system where the area's traffic flow is governed by sensors and centrally controlled traffic signals. CCTV cameras have been installed for surveillance purposes to record the movement of vehicles on the road. CCTV cameras can help with image processing, making it successful. The specific data regarding the quantity of passing vehicles is provided through image processing. This enables prompt and accurate vehicle monitoring. Using a sensor, a modified image is sent to VMS (variable message sign) displays. Transportation users will be able to discover the path that is void of traffic and change their direction accordingly.

In [4] Rizwan and Suresh proposes a network that makes use of the Internet of Things (IoT) to deliver and directly collect traffic information for analysis. To do Real-time streaming data is provided, along with big data analyses. There are many analytical methods which could be used to examine the vehicle density and propose solutions. A mobile application is developed as a user interface which offers an innovative technique of traffic management and permits consumers to gain insight into the traffic density at multiple places.

In [5] The Author Septia Redisa Sriratnasari suggested the use of ITS in the form of Bus Rapid Transit (BRT), the Bus Information Management System (BIMS), which is disseminating authentic bus arrival statistics Agency (BPTJ), the Advanced Traffic Signal Control Systems (ATSCS), a device that controls dynamic traffic indicators in real time, the Electronic Toll Collecting System (ETCS), specifically the implementation of toll bills using a special On-Board Unit (OBU) device, and the Relocate it and Traffic, specifically an integrated public delivery statistics software in Jabodetabek.

In [6] The Author Amudapuram Mohan Rao and Kalaga Ramachandra Rao suggested the various methods that could be used to detect and gauge urban arterial congestion. Based on measurement metrics like speed, travel time/delay, volume, and level of service, a systematic analysis is conducted. The review addresses numerous issues like definition and measurement criteria used by numerous countries and agencies.

STUDY CARRIED OUT ON RELATED WORK

According to the document listed below, the analysis of the current systems in relation to the proposed system is conducted.

Sl. No	Author(s)	Algorithms/Techniques	Performance Measures
1.	Gustav Nilsson, Giacomo	Advance Traffic Management System(ATMS)	Accuracy
2.	N.LasyaSree, LaSya Harshitha, and Venkata Bhargav, M.N.V.M.Sai Teja	Real Time traffic Control Algorithm for congestion	Accuracy
3.	P Indhiradevi, P Saravanakumar, R Varsha, S Sahithya	Image Processing Techniques	Accuracy
4.	Rizwan and Suresh	Big data and IoT Techniques	Accuracy
5.	SeptiaRedisaSriratnasari	ATSCS Technique using IoT	Accuracy

METHODOLOGY

- Step 1: Data Acquisition- The sensor gathers information on the current vehicle density on the route.
- Step 2: Data Storage- The sensors' data is gathered and kept on the cloud.
- Step 3: Data Computation and Processing- The

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microcontroller uses this data to decide how to modify the signal.

- Step 4: Data is delivered immediately to the microcontroller in an emergency, which ends the preceding loop and promptly changes the signal.
- Step 5: Models to generate better predictions, identify items, or comprehend the system to model. Models with clean data and a thorough knowledge of the content.

III.PROPOSED SYSTEM

The high-level architecture of Smart Traffic Management System model is depicted in figure.

The first step is to collect suitable information using Cameras etc in the data Acquisition and Collection Layer. The Collected data is then fed to the Data Computation and Processing Layer. The Computed data in the computation layer outputs the suitable change in the traffic signal using certain congestion control techniques thus causing the changes in an application as shown in the figure.

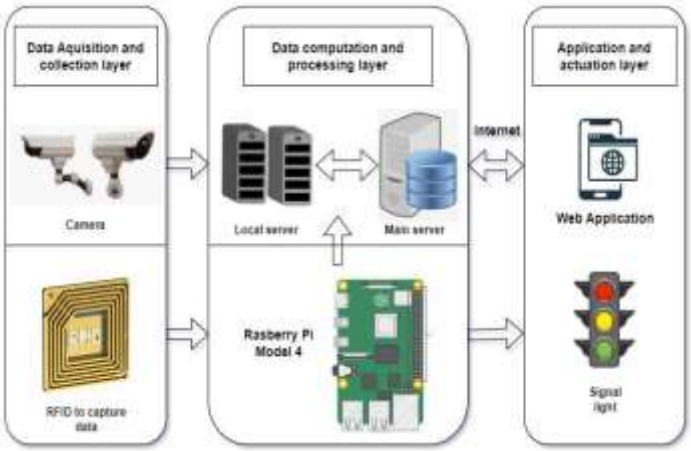

Fig: High Level System Architecture

USER INTERFACE DESIGN

The flowchart of Smart Traffic Management System using IoT. The standard real time for traffic change is taken and suitable signal change is calculated based on congestion in the traffic.

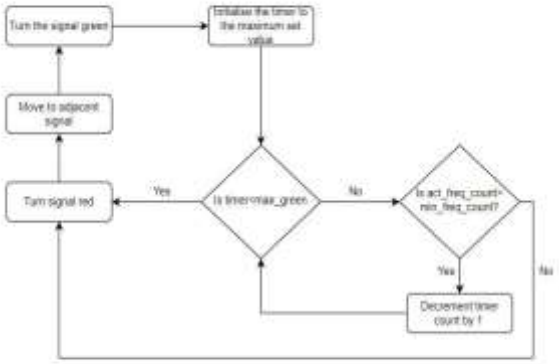

Fig: User Interface Design

IV. CONCLUSION

One of the greatest ways to reduce traffic congestion is to use a smart traffic management system. Our study suggests a real-time traffic information gathering and monitoring system as a solution to the problem of real-time monitoring and managing road vehicles through traffic signals by computing a number of vehicles. Many application and service systems have an equal impact on people's way of life in metropolises with

dense populations. As a result, the majority of cities are currently implementing automated technologies across all industries to transform their cities into smart cities. In light of the aforementioned, we have created an algorithm that minimizes waiting times and traffic to get you where you need to be as quickly as possible. The reasoning and methods shown in the current paper determine the volume of traffic at each signal and decrease the duration of that particular signal to reduce the volume of traffic.

V. FUTURE SCOPE

The goal of the study is to examine the potential benefits of STMS adoption in different countries. This paper also looks into the possible positives of utilizing STMS. Additionally, this section examines the technical barriers to implementing STMS.

VI. REFERENCE

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