Adaptive Routing Prediction for Regulating City Traffic

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ABSTRACT: The real time traffic management has become a big problem in daily life because of increasing vehicles, accidents on roads. The failure in traffic management leads to many problems like, delay in transport, not getting help in emergency, etc. The delay in transport also affects the development of city. The main objective of proposed system is to design system which can analyse the traffic and suggest the optimized path as an alternative arrangement. The Application will produce the prior notification about the traffic based on available data. The proposed system finds optimized route during the emergency services such as (e.g. ambulance, VIP, fire brigade) and sends notification to the preceding officer.

KEYWORDS: Traffic Management, Shortest Path, Message Passing System, Optimized route.

I. INTRODUCTION

Now days, there is an urgent need for the robust and reliable traffic assistance system to improve traffic control and management to solve the problem of increasing urban traffic. Vehicle detection technique appears to be the weakest in traffic guidance and control. Many traffic state parameters can be detected through traffic guidance system, including traffic flow density, the length of road, average speed of vehicles and number of vehicles travelled on that road at particular time slot. To get these results there have been many ways proposed for handling the related problems

The major challenge presented in dynamic traffic management is the optimal utilization of all the routes a according to their limitation in number and capacity. In most cases, it is inconvenient to construct new routes or increase roadway capacities. So identifying ways to maximize the utilization of the existing transportation network becomes more important. For this traffic management application, it is particularly important to establish a dynamic model which is based on dynamic network modelling techniques by considering the traffic network. This model should also have a simple structure that can be solved efficiently and quickly so that the optimal solution can be obtained soon after the disaster happens.

This paper is about implementation of the system which gives solution for dynamic traffic management system and message passing system among different traffic officers on duty under different sub or main police stations. The implemented concept helps in finding shortest routes to reach destination, clustered message passing system and hence improved real time traffic management system.

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II. RELATED WORK

The dynamic road traffic management is based on the dynamic vehicle routing during peak hour traffic. In Dynamic Vehicle Navigation System (DVNS), the certain traffic junctions are considered as start point and end point. There are different values assigned as per traffic conditions on that particular route. The selection of road depends on various aspects such as traffic weight, number of vehicle etc. The route selection is executed using the krushkal's algorithm based on different aspects. The user must select the start point and end point and sends the information to our system using Google maps; this system shows the o route to the user based on the dynamic routing table. The traffic officers have to update the traffic status using their mobile. The Dynamic routing table is updated periodically to accomplish the optimal solution.[1]

Recent research has proposed main stream traffic flow control (MTFC), enabled via variable speed limits (VSLs), a demonstrated its efficiency based on sophisticated control methods that face problems during practical field implementations. The MTFC controller uses only real-time values (no online model usage) and is therefore powerful and easy for field execution. The controller is evaluated in simulation and compared with ideal control results. the new controller's performance is shown to approach the optimal control results while assuming many practical and safety restrictions for a number of investigated scenarios. MTFC is a proposed novel control measure for motorway traffic management. A practicable local feedback-based MTFC concept has been presented to address known active bottlenecks by use of VSLs as an actuator [2]

III. PROPOSED SYSTEM

The proposed system uses Application server that receives current data of current location from traffic officer. The traffic officers forward the current status of traffic to application server. The Application server generates notification message to the next traffic officer and assigns some color codes for various levels of traffic. The traffic officer at various sites sends their status to a centralized server and server sends message to the route having considerably high traffic.
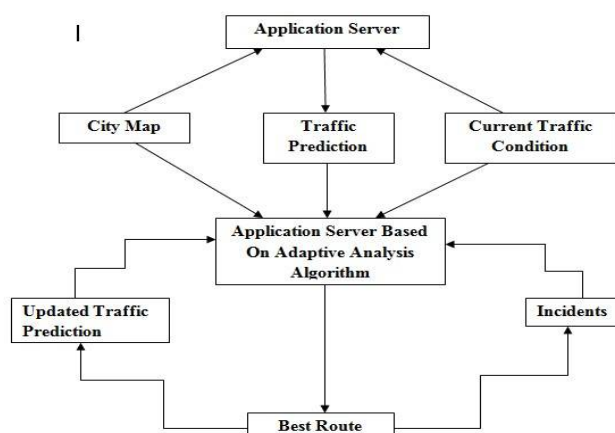

Figure 1 Setup of Proposed System

The figure1 shows the setup of proposed system. The description for the above figure is given below

- Application Server receives data which indicates status of traffic.
- Application server sends alert message to next traffic officer.
- The Application Server analyzes the City map and concludes the current traffic condition.
- The current traffic status is always updated on Application Server. The Application Server selects the best route from present traffic conditions. And also updates the best route on the Application Server.

A message passing takes place between:
- One to One Message passing:
  One Traffic officer will send traffic related notification to the next route traffic officer.
- Cluster message passing:
  In that Traffic related notification receives only those officers who are login in same sector.
- One to many message passing:
  In that all traffic officers will get traffic related notification who are login with mobile application

IV. SIMULATION RESULTS

The application developed is communicates with user device, a mobile application through Application server. Such that, the implemented concept includes two side of application, a web server accessible by everywhere and majorly used by control room. And a mobile application which is used by officers to pass emergency messages and to find shortest route path
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A. APPLICATION SERVER

Application server is nothing but a web server which maintains communication. The user has login to application server, which here act as control room for traffic management system. The user login to central application server is able to pass messages, assign duty to officers and set route weight according to current traffic status.

The application server also shows the traffic map having traffic density indicated by different color code. The same map also shows the traffic officer on duty in the form of icon.
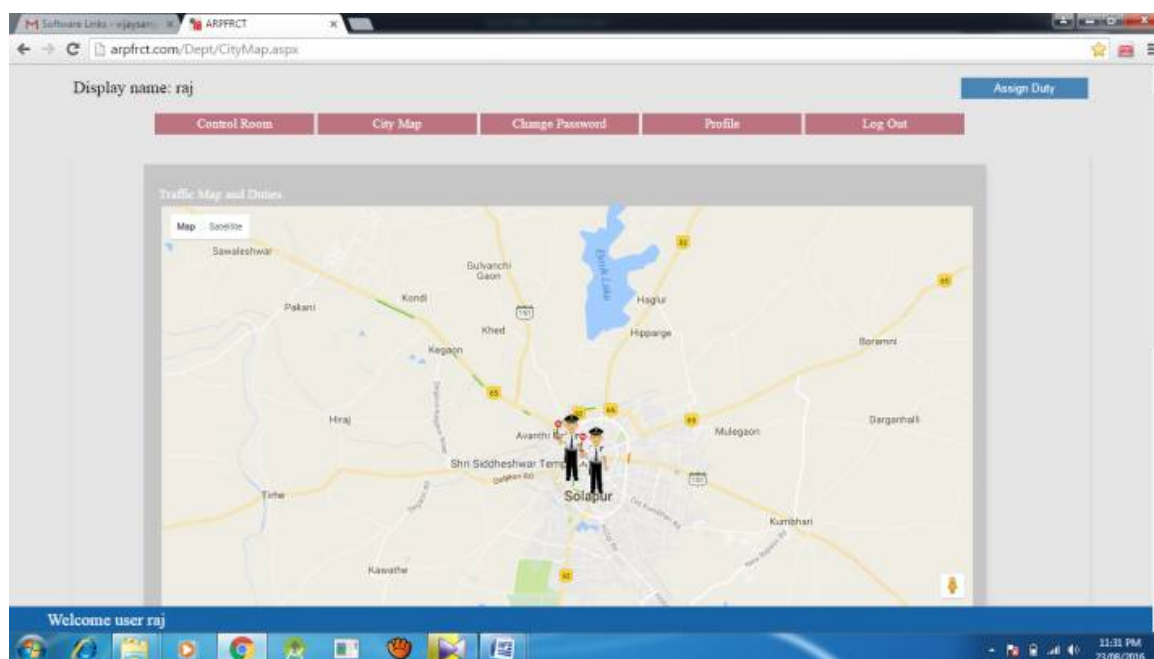

Figure 2 Screenshot Shows The Traffic Map And Officer On Duty.
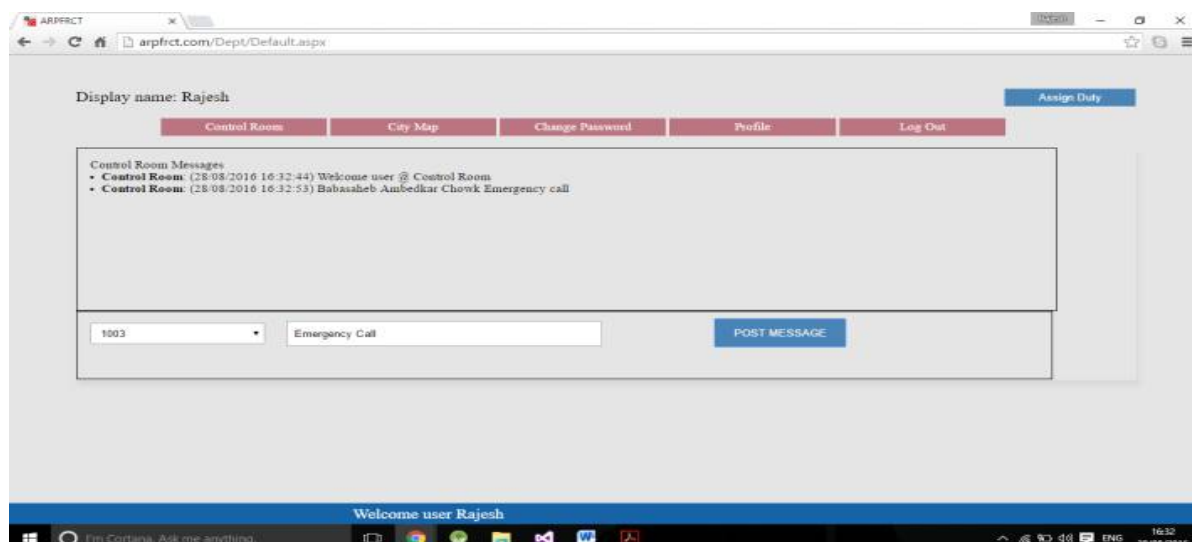
Figure 3 Screenshot the System Output Showing Message Passing System at Central Application Server

The traffic density which is termed as rate for shortest path calculation is updated according to traffic density as shown in above map.

B. Mobile Application

The mobile application is used by officers on duty to pass messaging to concern authority as per message type. The signalR communication is used for message passing system. The mobile application is used by officers on duty to pass messaging to concern authority as per message type. The signalR communication is used for message passing system.
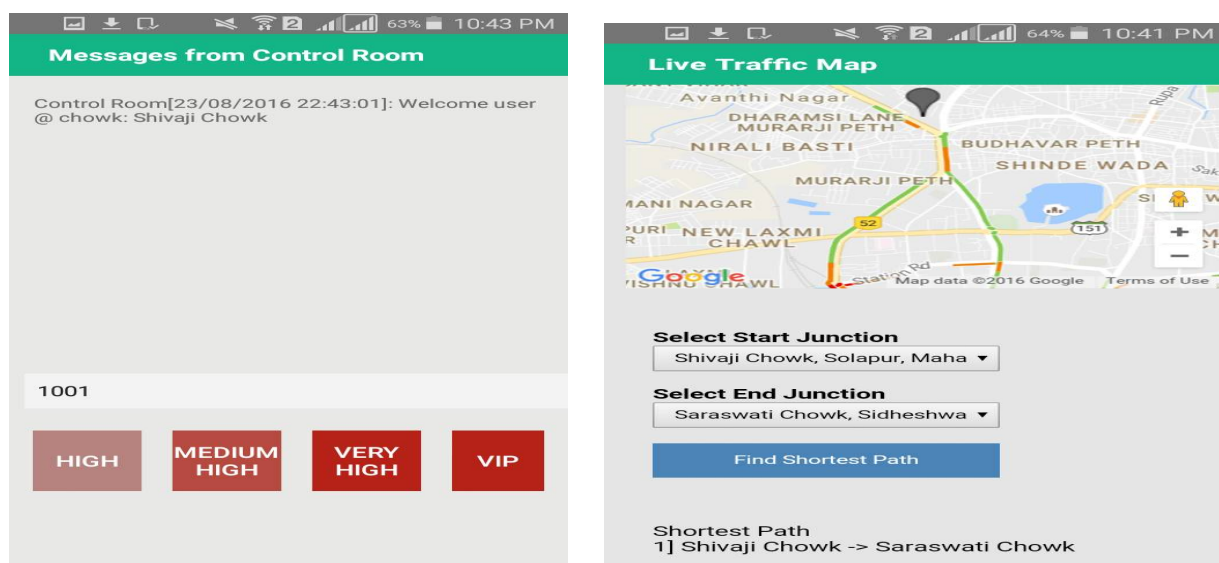

Figure 4 Screenshot Shows Message Passing System And Shortest Distance Route in Mobile Application

V. CONCLUSION AND FUTURE WORK

The current traffic system suffering problems like irrelative message broadcasting, time consuming process to handling traffic congestion. If there is a heavy traffic on a particular route, then the application server will send a notification to the next officer of that route. Having prior knowledge regarding the traffic status. The officer can easily manage traffic of their route. In peak hours the application server suggests shortest route which helpful for citizen and traffic officers to reach destination. The higher officer of traffic department easily watches their lower officers on map during working hours. The traffic control room easily contact to all road traffic officers through this application. In future we can send voice messages and access vehicle information from its registration number.

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