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Sharing Visual Traffic Information via Vehicular Cloud

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ABSTRACT: These days, automatically technology is advancing; in automobiles, vehicles are having cameras that are advancing to sense devices. Traffic data can be carried by the vehicles having ability to sense, driving ability can increase by vehicles can convey sensing data and people can be shared. For example, traffic controlling and road safety can be identified in vehicular networking area. Technology that having an impact on traffic controlling and road safety, utilizing vehicular assets, data storing, dealing and decision making is developing by Vehicular Cloud Computing (VCC). This paper clarifies about route scheduling in vehicular cloud, by using the architecture; we can share traffic images to social vehicular navigation. By using the vehicular cloud we can store the images and by using NaviTweets we can share images of traffic information. This paper presents the system architecture and a first execution running on a PC, alongside its evaluation.

KEYWORDS: Google maps, GPS, social sensors, navigation system, vehicular cloud.

I. INTRODUCTION

Technological advancements are making automobiles more intelligent as manufacturers have integrated them with GPS (Global Positioning system), and collision avoidance control systems. Congestion control for improving traffic via smart cars are using information gathered from crowd sourced vehicles with inbuilt GPS systems to identify conditions of traffic and speed. Using this information the navigation systems are used to plan a recommended list of routes for any trips. Push-based and Pull-based are the two such infrastructure-less services used widely. Most of the systems today pull-based GPS location anonymously from mobile devices to show traffic map live. Push-based is not widely used because here the traffic information is reported by the pubic director which is shared to the other drivers.

The traffic violations are mainly reported by the traffic officials and police. Nowadays, live traffic information on congestion of vehicles is widely and easily available via mobiles, online maps and devices with inbuilt GPS tracking systems. The route planning of the drivers is widely influenced by this information so that they can take less congested traffic routes. Based on ETA (Estimated time of arrival) the planning is done by using the suggested alternative routes which are less congested. ETA plays critical role in making route based decisions.

In this project, I've implemented the use of "NaviTweets" which contains the images with Geo-tagging information. This information is provided by vehicular cloud which helps the drivers in route decision and route planning.

Vehicular Navigation

1. In vehicular cloud, a group of vehicles participating in a cloud can share its resources.
2. By using Wi-Fi we can connect to road side unit (RSU) through vehicle-to-infrastructure in vehicular cloud.
3. Internet cloud, several integrated servers can occurred by vehicular cloud.

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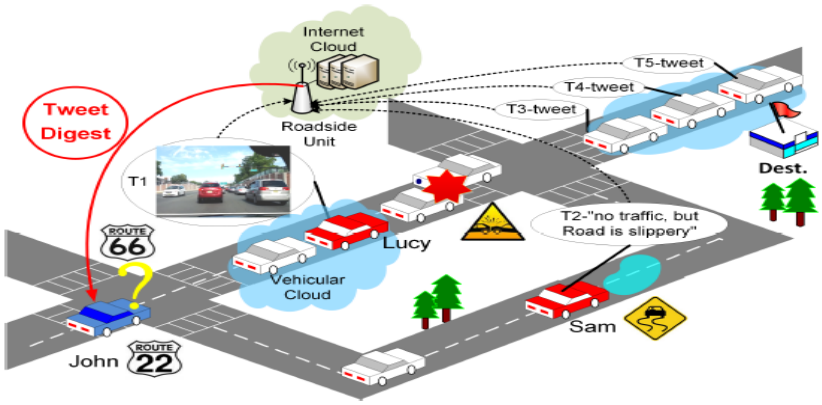

Fig 1: Example scenario

Fig 1 telling that, John is travelling on a route in that route accident occurred. By road side unit and cloud John gets a Tweet. These tweets can be shared by in front and back on that incident happened. John had seen these tweets then he wants to change the route. Then he checked another route in that any tweets are available. In that another car is tweeted like slippery, but there is no traffic. Then he can think about that route and he will choose his best way.

Layered Architecture Model

1. **Traffic Layer:** By giving source to destination to the route algorithm we can get estimated time of arrival is calculated. Mobile and static sensor data, automobiles can update speed information by using GPS data.
2. **Social traffic Layer:** In this social traffic layer vehicles which are participating in vehicular cloud who subscribed to it. Then predicting algorithm will be used by that alternative route will be shown to that driver.
3. **Presentation Layer:** The presentation layer can follow the instructions of traffic and social traffic layers from their route of interest.

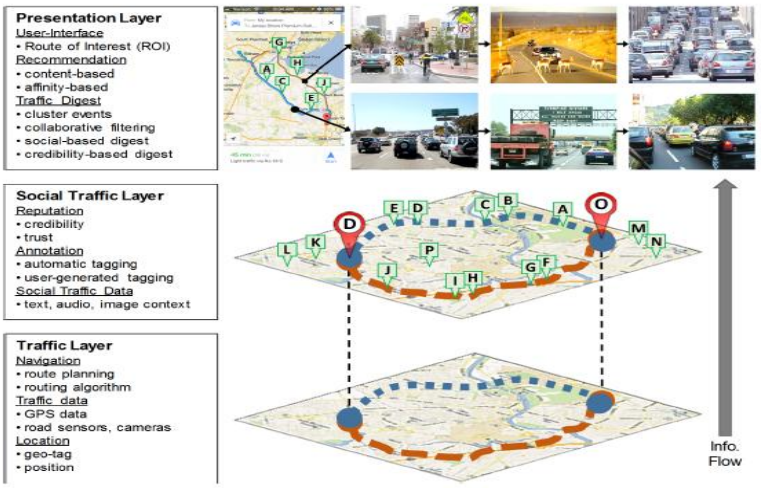

Fig 2: social vehicular navigation models

II. RELATED WORK

In this paper author designed architecture of VCC (Vehicular Cloud Computing) and the required properties that support vehicular cloud. This instrument contrasts and ordinary Cloud Computing (CC) and talks about open research matters and future ways. By exploring and examining writing, the author establishes that VCC is a mechanically doable

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and efficiently suitable innovative moving world view of joining wise vehicular systems towards self-sufficient movement, vehicle control and recognition frameworks [1]. In this paper author proposed a new VANET cloud service called Vehicular Witness as a Service (VWaaS) [2]. In this paper author present a real time detection of traffic-related events from twitter stream analysis. Traffic events can be presented by notify and classify streams of tweets can be fetched by Service oriented architecture (SOA). By determining the actual time of arrival by non-chosen alternative route to given destination by answering such questions in DoppelDriver[3]. Proposed a car navigation system, is the part of advancements of Intelligent Transportation System (ITS), hold up drivers are driving effectively by demonstrating the most brief routes and a few driving in a row, for example, to identified with car influxes and climate report, which are gathered from physical sensors and information given to media. This author exhibits a proposition of a technique to concentrate ongoing driving data utilizing online networking as a kind of 'social sensor'. This is a fresh out of the plastic new way to deal with getting significant data for drivers from online networking. Our strategy is valuable to give driving data in nations where current ITS organization is poor. It additionally gives drivers point by point data identified with the current traffic condition and flow activity circumstance. Our proposed framework can gather tweets alluding to overwhelming movement from Tweets [5].

III. EXISTING SYSTEM

1. Collaborative Sharing has driver can share their view what is the incident happened.
2. Traffic Information via Social Networking Services nowadays, traffic information is shared through Facebook, Twitter, etc.
3. Route Planning is it can send traffic images to the central station and then distributed to users.
4. Vehicular Social Networks travelling on the same roadways can be communicated.

Advantages:

1. We can get alternative route to change their direction.
2. By this, estimated time of arrival will be decreased.

Disadvantages:

1. Capacity of the system is limited because sensor based infrastructure is used mostly by existing systems.
2. By using public cloud cost will be high.
3. Data communication is complex.

IV. SYSTEM ARCHITECTURE

The system architecture of a Sharing Visual Traffic Information via Vehicular Cloud is shown below.

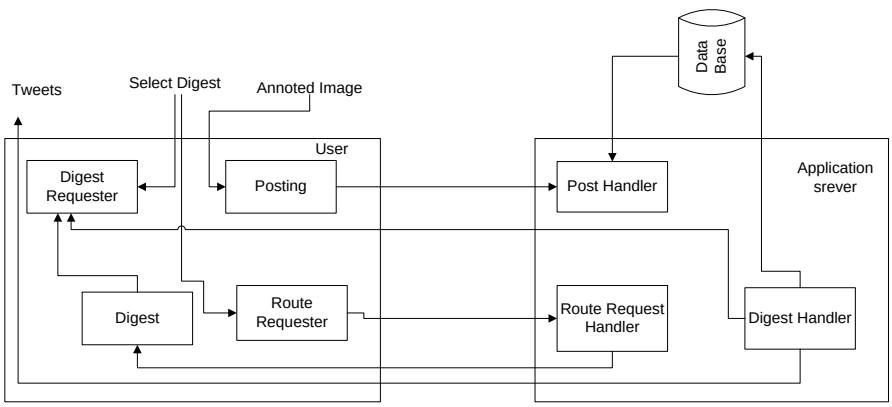

Fig 3: system architecture on Vehicular Cloud

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The system consists of two sub systems:

Device: This system consists of two ways: posting and viewing. In this user can post an image can be posted, these can be stored in server system. Post handler will receive all posts and save it into the data base. Route request handler can send to route requestor then it can be digested. Digest handler send the tweets to the user, that can be viewed from cloud.

Application Server: In this application server we can store the images and also we can resend to vehicles that are near to that area. And predictive route can be send to them by the application server. Application server can send all the information to the users that are near to that location. Digest handler will take data from cloud and send to the digest request.

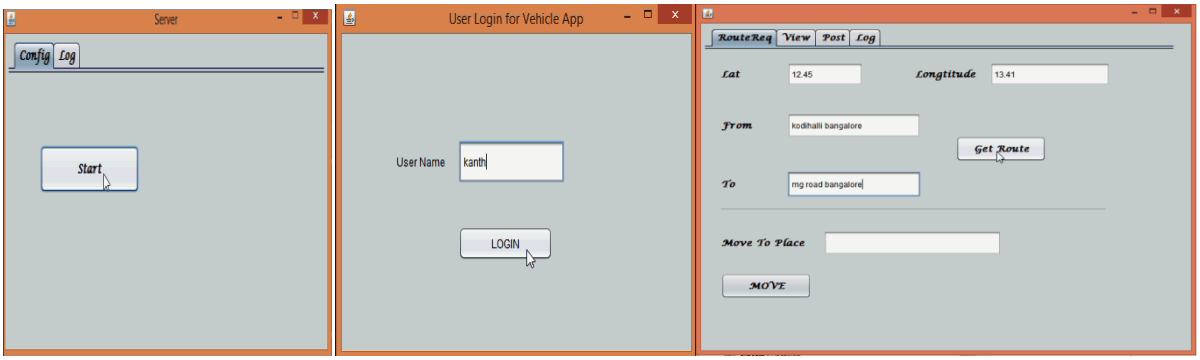
V. PROPOSED SYSTEM

Social Vehicular Navigation can be based on many online services. By using netbeans I designed a GUI server, starting with server. In that config and log will be designed, by clicking start button in config page, one notification can be visible in log. Now we want to run a vehicle, but first they want to login into that vehicle then can enter source to destination that can be stored in Google maps. In this I am using google maps to show the route of source to destination.

This can be run in pc by using application programming interface (API) in this we are using Google maps. After that another vehicle will be login. In that souce to destination will be in same route but different starting and ending point to vehicle-1. Vehicle-1 can send some traffic images either it may be accident, traffic jam, etc. It can be stored in Microsoft azure. Microsoft azure is a cloud that can store data which are posted by the vehicles and also traffic information. These can be visible to remaining vehicles that are near to that area by that condition the next vehicle near to that location will be changed the route to reach the destination. For that vehicle there will be alternative routes will be shown in the map to reach destination very fast they can decide which is the shortest route according to that map they can choose their decision.

VI. EXPERIMENTAL RESULTS

The running snapshots describe the results that we will get after very much requested execution of the impressive number of modules of the system.



(a) (b) (c)

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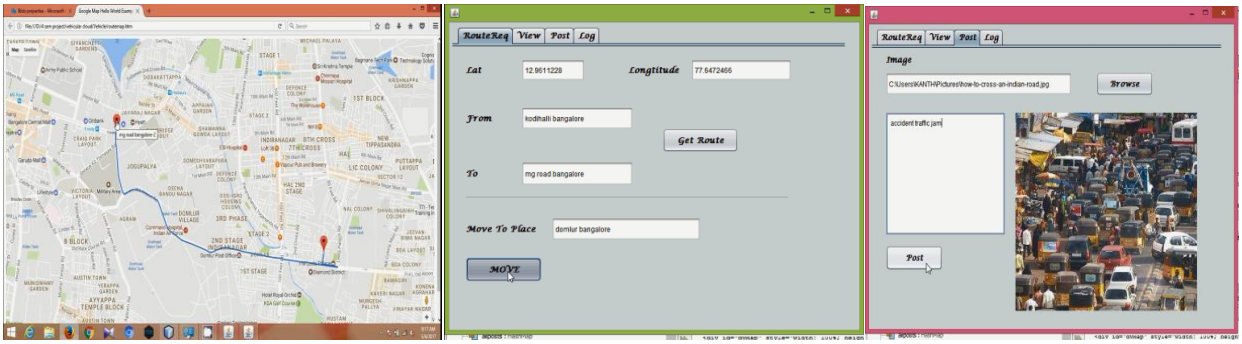
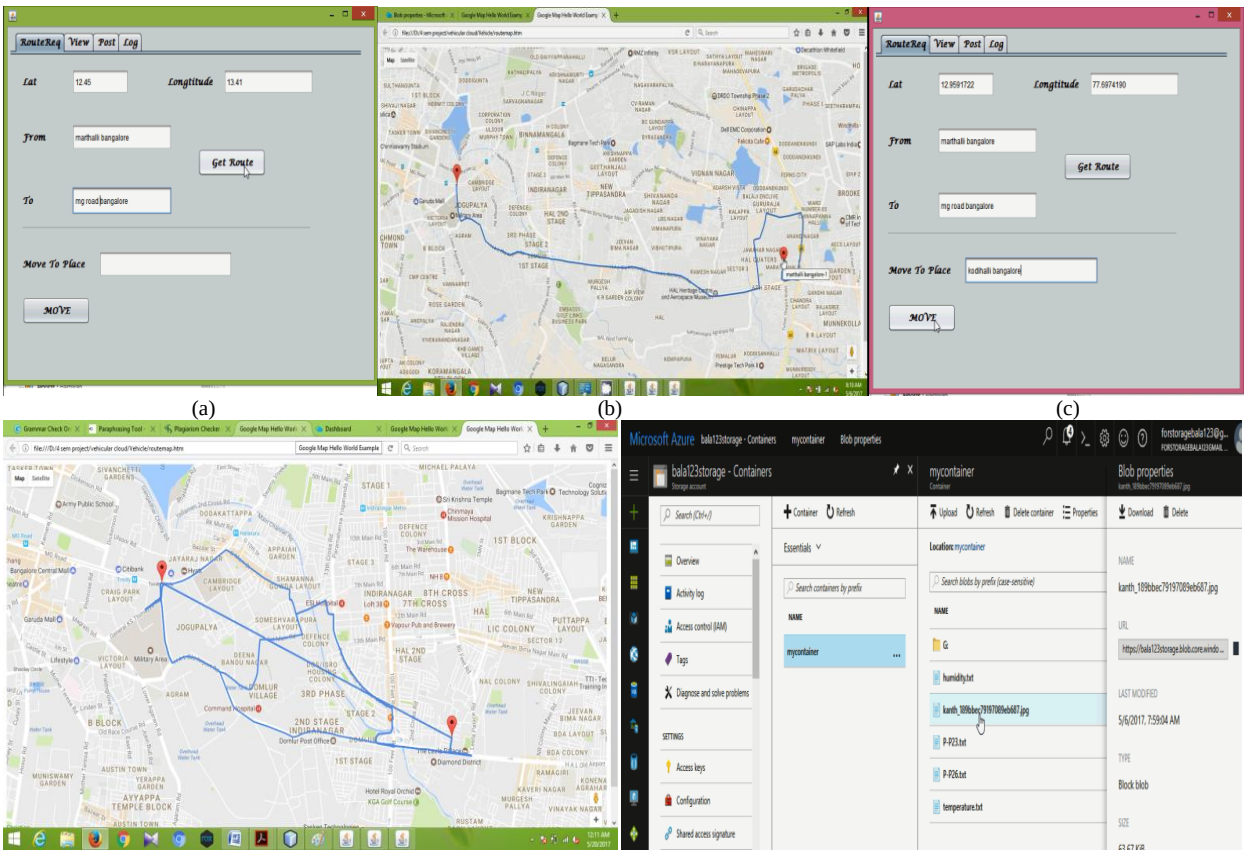


(d) (e) (f)

Fig 4: Start the server (a), Login into vehicle -1 (b), enter source to destination in route request (c) vehicle-1 Google map (d), particular place of moving (e), posting an image and tweet in comment box (f).

In fig 4 we are starting with a server in that server there are two conditions config and log. In config we can start the server that can be shown in log stage. Then we are start with vehicular app. After starting the vehicular app we can move into new page in that page route request is available. In that route request you may give source to destination. That can be shown in google map. While an incident happened in our route at a particular place then we can post a message by taking a picture.



(a) (b) (c)

(d) (e)

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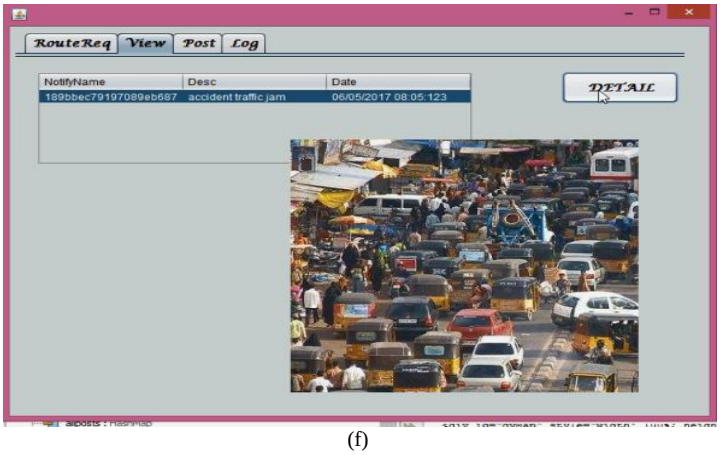

(f)

Fig 5: Enter source to destination in route request for vehicle-2 (a), vehicle-2 Google map (b), In which place vehicle-2 is moving (c), Alternative routed will be in Google map (d), cloud will store all the images (e), vehicle-2 can view the image in detail(f).

In fig 5 first we start the vehicle-2 after started the vehicular app it can repeat the same thing that vehicle-1 had done but in this vehicle-2 will moving in the same route but not same destination or starting point. Vehicle-1 is posted some posts at a particular point but in this vehicle-2 that can be shown before one kilometre itself. Then automatically alternative routes also visible according to that we can choose nearest path. These images can be stored in vehicular cloud. In vehicle-2 these details will be visible in view page.

VII. CONCLUSION

In this paper, drivers are sharing some important things like accident, traffic jam, etc. By this driver having some ability to get sense the route and also prediction route will be given who were located to that area. Here one of the vehicles is sharing some images to the cloud that can be visible to the other vehicle near to that location. In this paper we are not sending the information to the all vehicles only that are near to that area only that can be visible. In future by using bash board computers and also on board cameras, sense the real time traffic information, this can be applicable. This can improve by voice messages.

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