Monitoring and Analysing Real Time Traffic Images and Information Via using Database Cloud

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Abstract - *Now-a-days there are many conventional technologies implemented in the vehicles and many people thus using the navigation applications to at a wide range like in the transportations in travelling the navigation application are used the vehicle are using many features like sensing devices and cameras for navigation purpose in this paper it describes the vehicular cloud services. Which will be taking the services to another level. Which will be providing the collaborative traffic management and which will help to notify the users about the real time service of the path also an alternate route to reach their destination here we have presented the architecture for an collaborative image sharing system of the traffic called "collaborative vehicle navigation" which allows the drivers to report an firebase cloud by sharing the real time traffic information. Called traffic event here these events provide the reliable information about roads, real time situation about the road and can predicts the system design and implementation running with smart phones which are working on android platform along with its evaluation.*

Key Words: **Social vehicle navigation, Traffic digest, Vehicular social network, smart route decision, Cellular area, Traffic images.**

1. INTRODUCTION

There is Advancement in technology is making system smarter using Firebase, global positioning systems (GPSs), Geo spatial, GIS, and high definition Mobile cameras. Ongoing attempts to alleviate traffic congestion via smart System use crowd sourced traffic data collected from Firebase technology identify traffic situations traffic speed. to generate and present a list of recommended routes thus the navigation system will be needed which is provided hence, the classification of crowd sourcing services will be into two types can be classified into two types: push-based and pull-based.

In today's systems location information from mobile phone users the important GPS location information is taken or pulled from which live traffic map. The push based approach is depend on the real time participations. In which person who is driving will be uploading the context of the traffic information.(e.g. traffic incident, its location etc.) onto a cloud from where a data will be share to other peoples or drivers. There are many Different ways of reporting traffic Situations have been through the police, and traffic reporting offices. Nowadays, the real-time traffic updates on traffic congestion are becoming widely available and also easily accessible via live maps, cell phones, and devices which are equipped on GPS.

Here in the paper highlights the use of geo-tagged traffic images, which is known as the Traffic post, provided by the vehicular cloud to assist drivers in path planning and selection of route decision . We use a Firebase as the cloud service. Person who is planning a route can use the service and a can also request images with the traffic situation on paths and suggest alternative route to person. Any other drivers whose vehicles are subscribed to the same service collaborates and will share their real time traffic images by uploading traffic post concerning the Real time traffic situations or any sudden events. Firebase cloud computes a Traffic Digest that organizes the traffic reports into a user-friendly format to show the driver and aid the individual in route selection decision.

2. RELATED WORK

2.1 Collaborative Sharing

Drivers can specify their interest in a service, in which other drivers subscribed to the same service can collaborate by sharing necessary information with regard to the request. Described images where images taken from mobile cameras and upload to cloud. Uploaded image is surveillance service in which several vehicles are selected to take photo images of an urban landscape. However, the authors mainly focused on the security and privacy of the data exchange between entities [3]. Unlike traditional navigation systems, Waze [1] is a navigation app that collects traffic data from users to provide traffic reports to a central server, where such information is shared with other drivers to provide real-time traffic and road information, such as the volume of traffic, any road hazards, or accidents affecting traffic. Other navigation apps, such as Inrix Traffic [4], have included user-generated traffic reports, and after Google's acquisition of Waze, Google Maps added similar features in its mapping business.

2.2 Route Planning

Route choice behavior is associated with the decision-making process of route selection in transportation, and much research conducted to understand this complex behavior [8,9]. For route selection previously Studies did not consider traffic images as part of the criteria. Thus, there has been limited work on route selection behavior. However, there are patent proposals [10,11] and studies in the literature [12,13] that apply or identify the usage of traffic photos in route planning. Users have a receiver that displays the images so they can view the route ahead and choices the route. Adam et al. [11] proposed a navigation device that displays a route on map with locations where visual traffic information exists.

3. SOCIAL VEHICLE NEVIGATION

In the proposed system we have introduced a cloud based collaborative traffic management system. All users' data is synchronized to the cloud. As soon as any user create an event that describe problem in the route or any situation that will take longer time to travel, system automatically determines all other vehicles that are travelling to that route and in the range of 10km. To achieve that the vehicular cloud (VC) is used, where a mobile cloud is formed from a group of participating vehicles that collaborate to share its resources, i.e. sensed data from the local environment; each vehicle can opt into the VC and utilize its services;

Figure 1 depicts example scenario to illustrate the SVN architecture. John commutes to work and prefer to consider safety first when deciding between route 66 and route 22. However, the information to access the safety of the roads is not available in current navigators. Therefore, John registers with a vehicular cloud service that allows him to benefit from social feedback shared by other drivers in the VC ahead.

Lucy, driving on Route 66, experiences traffic congestion due to an accident ahead and shares this information by posting an image traffic post(TP1) to the cloud via firebase push message service. Similarly Sam post a description traffic post (TP2) noting that the bridge of Route 22 is slippery, but luckily there is little traffic. Other drivers in the VC along Route 66 have previously posted traffic posts (TP3-TP5) concerning the traffic accident at the same location in front of Lucy. The system recognizes that TP1 and TP3-TP5 refer to the same traffic accent, so it discards the older traffic posts while retaining TP1, which is most up to date. The system the aggregates TP1 and TP2 into traffic digest and send it to querying navigator. John acknowledges both routes' conditions based on a traffic digest and plan is route accordingly, where is decides to take Route 66, despite the slow traffic because he prefers a safe, albeit slow journey By using vehicular cloud services, shared real-time sensed data about the environment becomes a possibility.

Users can either post or receive other users' real-time sensed data about the traffic in more detail. Then, based on the user's perception of the traffic situation, the navigator can include the driver's preference in the route planning.

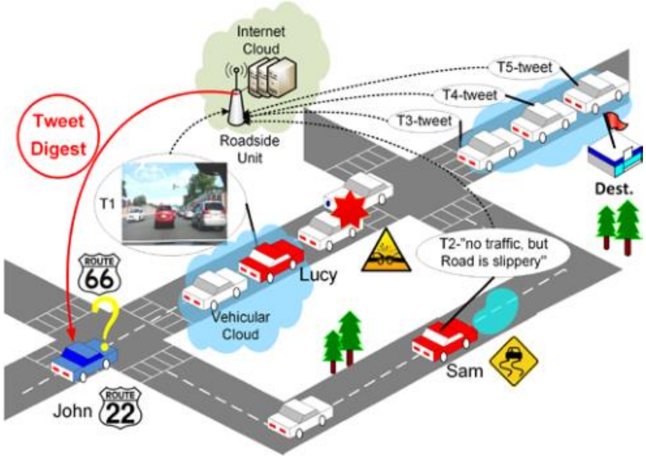

Fig.1. EXAMPLE SCENARIO

4. ARCHITECTURE

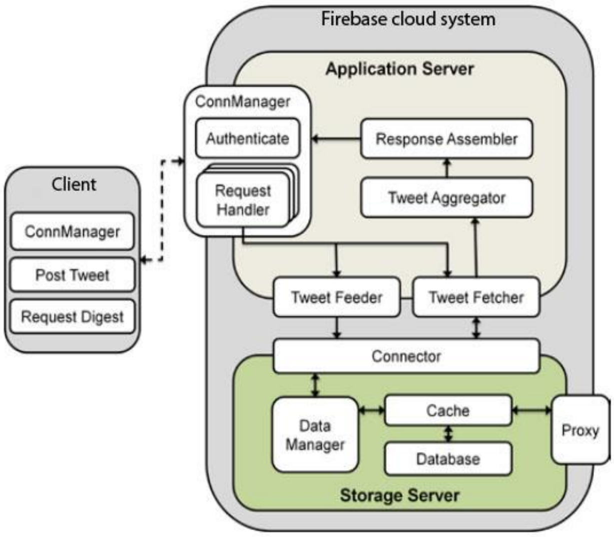

Fig. 2. ARCHITECTURE

System architecture contains mainly two parts.

1) Firebase Cloud System
2) Client

Firebase mainly contains application server and storage server. Application server verify user and give permission to post the tweets. These tweets very firstly stored in the firebase cloud storage. Then these stored data broadcasted in the form of tweets i.e. notification to the users who are travelling in the same cellular area created by event generator. When a user posts a NaviTweet, it is important to gather as much information as possible, while also being able to reduce the cognitive burden on the user. We propose two models for posting: active mode and passive mode. To minimize the cognitive load, the entire procedure is completed within three commands, where each command is executed by either voice or gesture. A variable, f, is defined as a threshold where the client device detects potential traffic congestion and takes a picture when f is larger than a predefined value. This value is set by using parameters, such as the current speed, acceleration and deceleration rates, and position. Several car-following models for traffic in stop-and-go conditions can be used to determine a suitable threshold value. Then, the user is prompted to share the image. If agreeing to post the NaviTweet, the user is prompted to annotate it. If agreed to again, a list of recommended tags like e.g. congestion, accident, hazard, construction, and others, is presented for selection via voice command. The only difference from active mode is that whenever the user wants to share a traffic image, the user can voice-activate the camera. Once the picture is taken, the annotating process is the same as active mode.

The application server(AS) sits on top of the storage server (SS) in the Firebase cloud system, where it receives posts from the mobile client subscribed to the VC. The connection manager (ConnManager) authenticates each user and dispatches the job to the handler. Depending on the type of request, the handler updates or retrieves data from the SS. We propose a simple API for communication between the AS and the SS. The SS provides two basic methods to the AS: put () and get (). The AS is designed to handle two types of request: post () and download (). Upon receiving post request T, the AS simply calls put (T). On the other hand, when a client asks to download a Traffic Digest, it sends the route of interest to the AS. Upon receiving the digest download request, the AS performs a process of selection, digestion, and composition to satisfy the request. The SS is the foundation of the Internet cloud, where it is dedicated to provide high-speed, lazy-consistent, and highly available storage services to small media files as well as their metadata. The tweets posted by the clients in the VC will be ultimately stored in the database in the SS. Also, both the metadata used by the Digestion process and the media files used in the Composition process are located in the Database subsystem.

5. SYSTEM DESIGN

We have referred SVN system and made some changes in architecture to improve efficiency and scalability. The problem domain includes unique features, such as short time event, increase in traffic communication in congested areas, cross-platform messaging solution, reliable delivery of messages, etc., which will provide challenges as well as advantages.

Network Performance

Network performance varies according to the commuting traffic volume, and it is expected that the aggregated network data traffic for uploading data is associated with pick rush hours. Network performance can be maintained by using firebase feature versatile message targeting as it helps to distribute messages to single device, to groups of device, or to devices subscribed to topics.

USER STUDY

The motivation for SVN implementation was to share traffic data that provides detailed information using images by developing a platform where users can easily to support drivers for route planning. The best user study approach is to deploy our application for studying the real behavior of tweet posting and the efficiency of the tweet digest. However, there are several limitations to such a user study. There is the lack of a decent number of traffic images that can be crowd sourced. Also, even if there were to be enough images, there needs to be drivers who take the corresponding route to make use of the images taken.

6. DISCUSSION AND FUTURE WORK

Several issues require further research security, privacy, malicious users, and last but not least, passenger safety must also be considered. Issues such as passenger safety and reducing cognitive load must be further examined through an analytical user study. Advancement in the proposed system is that different module could added such a that suppose user upload the accidental event on the system and describes the event as accidental event then automatically event notification will goes to nearest hospital. Along with this different modules like tracking systems, tour guide module can also be add in the system.

7. CONCLUSION

Users collaborate to share traffic images by using their mobile device camera with the use of firebase technology. This paper described a vehicular cloud service for route planning, where user captures the local traffic information from surrounded traffic in real time in contexts like text, images, and short videos. This paper introduced the use of traffic images provided through the firebase to assist drivers in route planning and route decisions. We proposed a social vehicular navigation system where driver-generated geo-tagged traffic reports can assist other drivers in route planning. The traffic reports are called NaviTweets, and summaries are called Traffic Digests, which are composed and sent to drivers on the relevant route.

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