© 2015 IJSRSET | Volume 1 | Issue 2 | Print ISSN : 2395-1990 | Online ISSN : 2394-4099
Themed Section: Engineering and Technology

Vehicle Management System using Cloud Services in the IoT Environment

Venkatesh M, Vignesh E,Venkatesh Babu A, Devi
Computer Science and Engineering, Dhanalakshmi College of Engineering, Chennai, Tamilnadu, India

ABSTRACT

The progression in cloud computing and internet of things (IoT) have given a guaranteeing chance to determine the difficulties brought about by the expanding transportation issues. We present a new multilayered vehicular data cloud platform by using cloud computing and IoT technologies. Two modern vehicular data cloud services, an intelligent parking cloud facility and a vehicular data mining cloud service, for vehicle monitoring in the IoT environment are also presented and determined using Data Mining models. Challenges and directions for future work are also provided.

Keywords: Modern Vehicles, GPS, mobile devices, Iot, HTTP, TCP/IP, SMTP, WAP, NGTP, ITS, VANET, SOA, PaaS, SaaS, IaaS, MAIL, SMS, MATLAB

I. INTRODUCTION

Modern Vehicles are increasingly equipped with a large amount of Iot devices (mobile devices, GPS devices, and embedded computers).In particular, various vehicles have possessed high sensing, networking, communication, and data processing capabilities, and can communicate with other vehicles or exchange information with the external environments over various protocols, including HTTP, TCP/IP, SMTP, WAP, and Next Generation Telematics Protocol(NGTP).As a result, many innovative telematics services, such as remote security for disabling engine and remote analysis, have been developed to improve drivers safety measures.

The progression in cloud computing and internet of things (IoT) expanding transportation issues, for example, overwhelming movement, blockage, and vehicle security. In the previous few years, specialists have proposed a couple of models that utilization cloud computing for actualizing canny transportation frameworks (ITSs). For instance, another vehicular cloud building design called ITS-Cloud was proposed to enhance vehicle-to-vehicle communication and road safety. A cloud-based urban activity control framework was proposed to enhance traffic control. Based on a service-oriented architecture (SOA) this framework utilizes various software services (SaaS, for example, crossing point control administrations, territory administration, cloud administration revelation administration, and sensor administration, to perform distinctive undertakings. These administrations additionally communicate with each other to trade data and give a strong premise to building a collaborative activity control and transforming framework in a circulated cloud environment. As a rising innovation created by quick advances in cutting edge remote telecom, IoT has gotten a great deal of consideration and is relied upon to convey profits to various application ranges including human services, assembling, and transportation. Presently, the utilization of IoT in transportation is still in its initial stage and most research on ITSs has not utilized the IoT innovation as a solution or an enabling infrastructure. To this end, we propose to utilize both cloud computing and IoT as an empowering base for adding to a vehicular information cloud stage where transportation-related information, such as movement control and administration, cars area following and observing, road condition, cars guarantee, and support data, can be insightfully joined and made accessible to drivers, carmakers, part-producer, vehicle quality controller, wellbeing powers, and territorial transportation division. An examination of utilizing information mining models to investigate vehicular information cloud in the IoT environment was likewise directed to show the practicality of vehicular information mining administration.

II. METHODS AND MATERIAL

A .Vehicular Network System

The first thought is that the roadside framework and the radio-prepared vehicles could communicate utilizing remote systems. To make organizing operations, for example, directing more successful, researchers had built up an inter-vehicular networks between vehicle system called vehicular ad-hoc networks (VANET).Cloud computing has been proposed to reshape vehicular programming and administrations in the cars space. As more cars are outfitted with gadgets that can get to the web. Existing vehicular systems, Different sensors, on-board gadgets in vehicles, and cloud computing to make vehicular cloud. They recommend that vehicular cloud are mechanically doable and will have a huge effect on the general public once they are assembled. Diverse vehicular administrations are regularly joined and used to execute the mapping, exemplification, conglomeration, and piece and permit vehicles to cooperate with different facilitated administrations outside the vehicles. The combination of sensors and correspondence innovations gives an approach to us to track the changing status of an item through the Internet. IoT clarifies a future in which an assortment of physical questions and gadgets around us, for example, different sensors, Radio Frequency ID (RFID) labels, GPS gadgets, and cell phones, will be related to the Internet and permits these items and gadgets to interface, collaborate, and impart inside social, natural, and client connections to achieve regular objectives.

B. Cloud Computing Services

Cloud computing has been proposed to reshape vehicular software services in the automobile domain. As more and more cars are equipped with gadgets that can get to the internet. They propose that vehicular cloud are mechanically attainable and will have a huge on the general public once they are manufactured. Along these lines, both existing cars programming and a mixture of data assets are being virtualized and bundled as administrations to manufacture vehicular cloud. Distinctive vehicular administrations are regularly consolidated and utilized to execute the mapping, embodiment, and total and permit vehicles to collaborate with different facilitated administrations outside the vehicles. At present, utilizing the secluded approach, multilayer and SOAs to coordinate different vehicular assets and administrations seems, by all accounts, to be the most guaranteeing model what's more, system for building vehicular cloud administration stages. By utilizing the particular way to deteriorate a complex framework into littler subsystems as indicated by their capacities, we can partition a vehicular cloud administration stage into various utilitarian administrations and subsystems, for example, movement organization, administration steering, data handling, vehicle guarantee investigation and mining, and so forth. As cloud computing incorporates three unique administrations stage as an administration (PaaS), base as an administration (IaaS) and in addition the well-known programming as an administration (SaaS), a compound of SaaS, PaaS, and IaaS ought to be utilized for building vehicular cloud administration stages. Moreover, cloud can likewise be separated into private, open, and mixture cloud. In this way, vehicular cloud administration stages can likewise be intended to be a and half cloud where a few administrations, for example, client data inquiry, can be facilitated on open cloud stages and other missing-discriminating administrations, for example, movement organization, ought to be facilitated on private cloud stages .

1. Intelligent Parking Cloud Service:

a. Background subtraction
b. Decision Process
c. Web server process
d. Android application service

a. Background subtraction:

Background Subtraction is a computational vision process of extracting foreground objects in a particular scene. A foreground object can be described as an object of attention which helps in reducing the amount of data to be processed as well as provide important information to the task under consideration. Often, the foreground object can be thought of as a coherently moving object in a scene.

b. Decision Process:

The Car Parking Area, when parked by cars, means it is defined as “Occupied”. The car parking area has a free

space means it is defined as "Vacant". This decision updated to server part. Finally, in decision step, the mixed feature is compared with pre-defined threshold.

c. Web server process:

Al the processes are updated to the web server which receives the value from the DB via MATLAB. We send SMS and MAIL (1 per day) to monitor the delayed car duration (12 hours above) based on the Validated information.

d. Android application service:

Android application collects all information from server through web server, and it calculates total no of slots, encaged and free slots. It shows graphical view for encaged and free slots via apps. It validating information's continuously to the web server.

2. Communication from vanets to cloud:

In this section we will create a registration form for drivers, who have to register in the cloud. Registration of driver is compulsory then only the driver can take car from networking side. Once the registration process is done and updated to cloud, driver will provides his details for verification once the verification forces done successfully, and then the driver chooses the car brand and model and current location. After choosing this system automatically generates the values I he/she wearing seat belt or not and alcoholic or not. And for every few sects he will be keep on moving to some other place in between this the jerk level for that road. All this details we updating in to cloud.

3. Vehicular Data Mining Cloud Service

As vehicular information cloud contain a mixture of heterogeneous information and data assets, successful information mining administration must be created to rapidly identify hazardous roads circumstances, issue early cautioning messages, and help drivers to settle on educated choices to avoid mishaps. Information mining administrations can likewise be utilized to evaluate drivers' conduct or execution of vehicles to discover issues ahead of time. The centre of any information mining administration is the information mining models. In this way, few models were produced and tried for mining vehicular information gathered from vehicular systems or information cloud. The following is a specific information digging administration for cars guarantee early-cautioning analysis. In vehicle assembling procedure, now and then, some quality issues can be covered up for quite a while without being distinguished. Because of an absence of occasions or signs to correspond a few discrete issues, potential issues may Not be researched by any stretch of the imagination. To dodge mishaps, it is vital to grow new methods that uncover these shrouded issues ahead of time. By utilizing the two adjusted information mining models to bunch and arrange the genuine cars guarantee and support information we gathered from a neighbourhood car organization, we exhibited how information mining cloud administration could be utilized to distinguish potential issues that could turn into an issue later. This investigation expects another item that is being worked on and has some potential however obscure issues. As a consequence of applying the two information mining models, we had the capacity procure some preparatory results. We found that the accuracy in section cross dropped drastically.

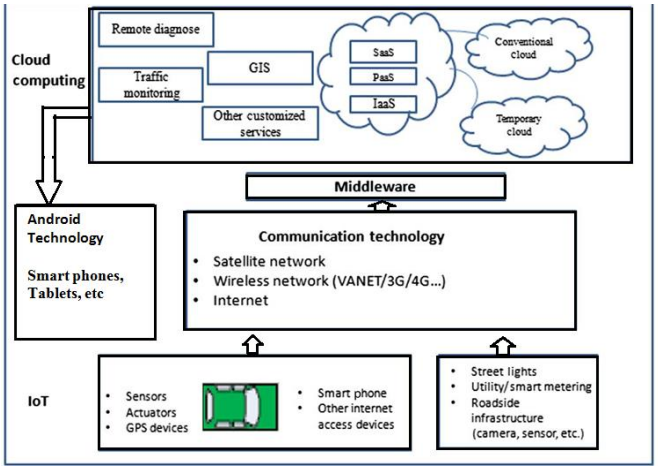

Figure1: Architecture

III. RESULTS AND DISCUSSION

IoT-based vehicular information clouds must be productive, versatile, secure, and dependable before they could be conveyed at an extensive scale. Existing calculations and instruments are unacceptable to meet all these prerequisites in the meantime. The following is a depiction of some of these difficulties.

1) **Scalability and Integration**

The viability of a vehicular cloud relies on upon its versatility to handle a progressively changing number of vehicles. Notwithstanding taking care of standard activity, vehicular clouds must have the capacity to handle movement spikes or sudden requests brought about by exceptional occasions or circumstances, for example, game diversions or crises. More improvement on enhancement calculations that facilitate virtual machines, storage room, and system data transmission to adjust server workload and enhance processing asset usage on the vehicular clouds is required As new gadgets and advancements are turning out every year, creating powerful IoT Middleware that backings reconciliation of these new advancements and gadgets with existing in-vehicle innovations from cars producers will be a test.

2) **Security and protection**

There are some security and protection concerns with vehicular information clouds because of an absence of built framework for validation and approval a low security level of vehicular information clouds is unsuitable for vehicular administrations with respect to transportation security. Case in point, roadside aggressors might malevolently send numerous fake appeals to the stopping cloud administration and store numerous parking spots. They can likewise send deceiving stopping accessibility data or off-base area data to the stopping cloud administration to cause tumult. Trust connections are difficult to be inherent vehicular clouds in view of the expansive and alertly evolving number of vehicles out and about. Adjusted efforts to establish safety are expected to upgrade the security and trust of cloud administrations without constraining the adaptability of the framework. In expansion, numerous drivers don't need their vehicle areas to be followed or observed because of the stresses over their security. Sensible endeavours in innovation, law, and regulation are expected to secure the vehicular information clouds furthermore, anticipate unapproved access to or divulgence of the protection information. Case in point, actualizing security verification in vehicular information clouds is obliged security countermeasure.

IV. CONCLUSION

In this paper, we show a novel measured and multi layered vehicular information cloud stage taking into account cloud computing and IoT innovations. We likewise talk about how cloud administrations could be created to make the vehicular information clouds helpful. This study makes commitments by proposing a novel programming construction modelling for the vehicular information clouds in the IoT environment, which has the abilities to coordinate various gadget s accessible inside vehicles and gadget s in the street framework. IoT-based vehicular information clouds are relied upon to be the foundation of future ITSs with a definitive objective of making driving more secure what's more, more agreeable. However, inquire about on coordinating IoT with the vehicular information clouds is still in its earliest stages and existing study on this point is profoundly lacking. To make vehicular information clouds valuable, various administrations, for example, street route, activity management, remote monitoring, urban surveillance, information and entertainment, and business discernment, need to be developed and send on vehicular information clouds. A number of challenges, for example, security, protection, versatility, reliability, quality of service, and absence of worldwide standards still exist. Because of the complexity involved in implementing vehicular clouds and integrin ding various gadgets and frameworks with vehicular clouds, a systematic approach and collaboration Among academia, the cars mobile companies, law enforcement, Government authorities, standardization bunches, and cloud administration suppliers are expected to address these challenges. In spite of the fact that with numerous difficulties, IoT and cloud computing provides enormous support solidarities for technology innovation in the cars indus attempt and will serve as enabling infrastructures for developing vehicular information.

V. REFERENCES

[1] A. Iwai and M. Aoyama, "Carsmotive cloud service systems based on service-oriented architecture and its evaluation," in Proc. IEEE Int. Conf. Cloud Comput., Washington, DC, USA, 2011, pp. 638–645.

[2] Y. Zhao, "Telematics: Safe and fun driving," IEEE Intell. Syst., vol. 17,no. 1, pp. 10–14, Jan./Feb. 2002.

[3] S. Bitam and A. Mellouk, "ITS-cloud: Cloud computing for intelligent transportation system," in Proc. IEEE Global Commun. Conf.,Anaheim, CA, USA, 2012, pp. 2054–2059.

[4] P. Jaworski, T. Edwards, J. Moore, and K. Burnham, "Cloud computing concept for intelligent transportation systems," in Proc. 14th Int. IEEE Conf. Intell. Transp. Syst., Washington, DC, USA, 2011, pp. 391–936.

[5] Z. Pang, L. Zheng, J. Tian, S. Kao-Walter, E. Dubrova, and Q. Chen, "Design of a terminal solution for integration of in-home health care devices and services towards the internet-of-things,"Enterprise Inf.Syst., to be published, 2014.

[6] L. Xu, "Enterprise systems: State-of-the-art and future trends," IEEE Trans.Ind. Informat., vol. 7, no. 4, pp. 630–640, Nov. 2011.

[7] S. Li, L. Xu, and X. Wang, "Compressed sensing signal and data acquisition in wireless sensor networks and internet of things," IEEE Trans. Ind. Informat., vol. 9, no. 4, pp. 2177–2186, Nov. 2013.

[8] Y. Li, M. Hou, H. Liu, and Y. Liu, "Towards a theoretical framework of strategic decision, supporting capability and information sharing under the context of internet of things," Inf. Technol. Manag., vol. 13, no. 4, pp. 205–216, 2012.

[9] P. Papadimitratos, A. La Fortelle, K. Evenssen, R. Brignolo, andS. Cosenza, "Vehicular communication systems: Enabling technologies,applications, and future outlook on intelligent transportation," IEEE Commun. Mag., vol. 47,11, pp. 84–95, Nov. 2009.

[10] H.Abid,L.T.T.Phuong,J.Wang,S.Lee,andS.Qaisar,"V-Cloud:Vehicular cyber-physical systems and cloud computing," in Proc. 4th Int. Symp. Appl. Sci. Biomed. Commun. Technol., Barcelona, Spain, 2011, p. 165.

[11] S. Olariu, I. Khalil, and M. Abuelela, "Taking VANET to the clouds,"Int. J.Pervasive Comput. Commun., vol. 7, no. 1, pp. 7–21, 2011.

[12] Y. Leng and L. Zhao, "Novel design of intelligent internet-of-vehicles management system based on cloud-computing and internet-of-things," in Proc. Int. Conf. Electron. Mech. Eng. Inf. Technol., Harbin, Heilongjiang, China, 2011, vol. 6, pp. 3190–3193.

[13] R. Hussain, J. Son, H. Eun, S. Kim, and H. Oh, "Rethinking vehicular communications: Merging VANET with cloud computing," in Proc. IEEE 4th Int. Conf. Cloud Comput. Technol. Sci., Taipei,Taiwan,2012,pp.606–609.

[14] R. Mietzner, F. Leymann, and T. Unger, "Horizontal and vertical combination of multi-tenancy patterns in service-oriented application," EnterpriseInf. Syst., vol. 5, no. 1, pp. 59–77,2011.

[15] H. Panetto and J. Cecil, "Information systems for enterprise integration, interoperability and networking: Theory and applications," Enterprise Inf. Syst., vol. 7, no. 1, pp. 1–6, 2013.

[16] S. Hachani, L. Gzara, and H. Verjus, "A service-oriented approach for flexible process support within enterprises: Application on PLM systems," Enterprise Inf. Syst., vol. 7, no. 1, pp. 79–99, 2013.

[17] F. Tao, H. Guo, L. Zhang, and Y. Cheng, "Modelling of combinable relationship-based composition service network and the theoretical proof of its scale-free characteristics," Enterprise Inf. Syst., vol. 6, no. 4, pp. 373–404, 2012.

[18] D. Paulraj, S.Swamynathan, and M. Madhaiyan, "Process model-based atomic service discovery and composition of composite semantic web services using web ontology language for services (OWL-S)," Enterprise Inf. Syst., vol. 6, no. 4, pp. 445–471, 2012.

[19] J. Wang, J. Cho, S. Lee, and T. Ma, "Real time services for future cloud computing enabled vehicle networks," in Proc. Int. Conf. Wireless Commun. Signal Process., Nanjing, China, 2011, pp. 1–5.