

Review Paper: Chance and Remonstrance of Cloud Computing in Health Care Services

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Abstract—Cloud computing is another method for conveying services and resources. Many specialists and directors accept that it can improve human health services administrations, advantage social insurance research, and change the substance of health data innovation. However, similarly as with any advancement, cloud computing should be thoroughly assessed before its profound adoption. This paper examines the idea and its present spot in health care, to assess the chances and difficulties of this computing model. Vital arranging that could be utilized by a Health association to decide its strategy, resource allocation and direction.

Keywords—Cloud Computing, Load Balancing, Resource Provisioning, Resource Scheduling, Service Level Agreement (SLA)

I. INTRODUCTION

A. Cloud Computing: A New Economic Computing Model

Cloud computing is a greatest registering paradigm which is engaged by economies of scale. It is a pool of overseen registering power, powerfully adaptable, virtualized, disconnected, stages, pool of capacity and administrations are conveyed on plea of clients through web. Cloud computing is web-based computing, where various administrations as servers, applications are given to an association or individual clients. cloud computing enable their clients to put and get their data and information into cloud. The client got a wide range of administrations from cloud through web.

At the point when clients utilize a cloud service, they saw virtual view. In cloud information and administrations are conveyed at various areas. As the cloud depends on the web administration and web administration depends on the web. Web has its very own security shortcoming. As it is open and it has numerous assaults and dangers. Cloud computing centers around sharing the data and calculations over system of nodes which is versatile [1].

Types of Deployment models:

Open cloud: Public cloud can be gotten to by any endorser with a web association and access to the cloud space.

Private cloud: Private cloud can be set up for a particular gathering or association and limits access to simply that gathering.

Hybrid cloud: In Hybrid cloud condition, association expends assets from both private and open mists.

Network cloud: A people group cloud is shared among at least two associations that have comparative cloud necessities [2].

TYPES OF CLOUD PROVIDERS

- **Software as a Service (SaaS):** - SaaS customers lease use of utilizations running inside the Cloud's supplier framework, for instance Salesforce. The applications are regularly offered to the customers by means of the Internet and are overseen totally by the Cloud supplier. That implies that the organization of these administrations, for example, refreshing and fixing are in the supplier's obligation. One major advantage of SaaS is that all customers are running a similar programming adaptation and new usefulness can be effectively coordinated by the supplier and is in this manner accessible to all customers.
- **Platform as a Service (PaaS):** - PaaS Cloud suppliers offer an application stage as an administration, for instance Google App Engine. This empowers customers to convey custom programming utilizing the apparatuses and programming dialects offered by the supplier. Customers have power over the sent applications and condition related settings. As with SaaS, the administration of the hidden foundation exists in the obligation of the supplier.
- **Infrastructure as a Service (IaaS):** - IaaS conveys equipment assets, for example, CPU, plate space or system parts as an administration. These assets are normally conveyed as a virtualization stage by the Cloud supplier and can be gotten to over the Internet by the customer. The customer has full control of the virtualized stage and isn't in charge of dealing with the hidden framework.

- **Security as an administration (SECaaS):** - is a plan of action where an enormous specialist organization coordinates their security administrations into a corporate framework on a membership premise more expense viably than most people or companies can give individually, when absolute expense of proprietorship is considered. These security benefits frequently incorporate verification, against infection, antimalware/spyware, interruption discovery, and security occasion the executives, among others.
- **Data as an administration, or DaaS:** - is a cousin of programming as an administration. Like all individuals from the "as a Service" (SaaS) family, DaaS depends on the idea that the item, information for this situation, can be given on interest to the client paying little respect to geographic or authoritative partition of supplier and purchaser. Furthermore, the development of administration situated engineering (SOA) has rendered the genuine stage on which the information dwells additionally unimportant. This advancement has empowered the ongoing development of the moderately new idea of DaaS. Information gave as an administration was at first principally utilized in web mashups, however at this point is as a rule progressively utilized both industrially and, less normally, inside associations, for example, the UN

II. CLOUD COMPUTING IN HEALTHCARE SECTOR

Cloud computing in human services is developing by every day and assumes a noteworthy job in the field of medicinal services. Generally, medicinal services part under-innovation particularly in improving the conveyance of patient consideration. Social insurance has entered sixteen years after thousand years, however henceforth in medicinal services, the quantity of frameworks works physically, by and large or transferring on paper, for example, restorative records to advise and settle on choices in a large portion of the conditions still essentially high. Human services industry contrasts extraordinarily from different businesses, and the key contrasts of the social insurance industry with other industry can be arranged into three fragments. Right off the bat, this division is exceedingly managed by administered law including guidelines to shield patients. Besides cost of high-chance blunders to happen in medicinal services are costlier than in other industry, lastly, this segment comprises of various number units, for example, clinic organization staff, labs, and patients.

Exceptionality protection of human services and security of patients' information makes the information itself delicate and any criteria deceiving will cause serious effect and may prompt decisive on occasion. Subsequently, the affectability

of information dealing with can result to be unhurried by the selection of new advancements. All around, human services is rearranged, and change causes the medicinal services data advancements [HIT] to be modernized and as a pathway for this course or focus of this change is unquestionably Cloud computing decisively.

Reception of Cloud computing in human services can forebodingly improve the social insurance framework particularly in the safe place of productivity, viability, and unwavering quality. Cloud computing offers a framework that licenses emergency clinics, restorative practices, and insurance agencies including research offices which use registering assets at lesser of beginning capital expenses [6]. By actualizing this Cloud computing in social insurance, get to costs which will normally be in a huge number of dollars every year, particularly in duplication and waste, can be defeated altogether.

There are different appropriate motivations to utilize Cloud computing in social insurance and various issues can be comprehended, for example, confinement limit of capacity, high working expense, and enhancing asset. Movement of social insurance segment towards Cloud computing brings some hazard which emphatically interrelated to the protection and security despite the fact that advantages from this choice is feasible. Thusly, it is important to look after, redesign, and screen the equipment and programming which comprises of social insurance information and are critical so as to keep away from negative results [7]. The engineering of Cloud computing has the capacity to collect, coordinate, dissect the information from different sources either progressively and grants specialists to get to patient records with no obstruction of spot and time. One of the offers that significant in medicinal services that should be possible by Cloud computing is the capacity of recuperation of information in a crisis state, for example, catastrophe recuperation, and reinforcement information excess as it recreates the information in various areas for more weight and openness [8].

III. CURRENT STATE OF CLOUD COMPUTING IN HEALTHCARE

In the course of the most recent couple of years, Cloud computing innovation has slowly picked up consideration in research and quantities of executions have expanded out in the open and private divisions also. As indicated by Economics Commerce and Management of United Kingdom, real organizations were required to contribute over \$150 billion on Cloud computing by 2014 yet anyway the last outcomes demonstrate the last sum is far higher than anticipated before. In addition, examines on worldwide medicinal services IT

patterns, expected overall human services Cloud computing part's income in 2017 will undeniably lift up to \$5.4 billion due to upwelling of this segment. Besides, the prime patron, North America forecasted to affect the piece of the overall industry of this segment up to \$6.5 billion out of 2018 from 1.7 billion out of 2013. Canada is the nation that perceived analytic imaging storehouses the nation over so as to help in patients care and just as cost sparing. In light of study, measurement demonstrates that 37% of medicinal services specialist organizations have vital plans with selection of cloud, 22% are in the arranging stages while 25% are amidst executing in which this can drive the particular business.

Description	Cloud
Latency	High (eventual consistency)
Access	Fixed and wireless
Explicit mobility	NA
Control	Centralized/hierarchical (full control)
Service access	through core
Availability	99.99%
Price per server device	\$1500-3000
Main content	Humans
Content generation	Central location
Content	End devices

IV. MATERIALS AND METHODS

This segment introduces the proposed framework engineering, the product and equipment modules expected to actualize and send the unavoidable checking foundation and furthermore shows the execution of an underlying model that demonstrates the usefulness of the framework.

A. Proposed System Architecture

This segment talks about the proposed IoT based engineering for getting and overseeing sensor information on the Cloud.

The primary parts of the proposed engineering are:

- The wearable and portable sensors that get understanding bio sign, movement and logical data.
- The sensor door that gathers every one of the signs from the sensors and advances them to the Internet. It very well may be a cell phone or a microcontroller stage fit for speaking with the Internet. It likewise advances data about the status of the sensors (e.g., legitimate activity, control source levels, and so on.).

- The correspondence APIs that are given by the

Cloud stage. The last are lightweight interfaces (like REST Web Services) than can be utilized by the sensor passages for sending sensor information and recovering data. The API can likewise be used by outer applications for information preparing, ready administration, charging, and so forth.

- The overseeing application comprises of an electronic application that is refreshed continuous and gives perception of the sensor information (in diagrams, and so forth.) and significant data about the patient's specific circumstance (like area, movement status, and so forth.).
- The Cloud foundation that has the interfaces and the overseeing application. It gives the basic assets (like CPU, stockpiling and application servers) for conveying the web application and the interfaces that empower the correspondence with the sensors and the different outside frameworks.

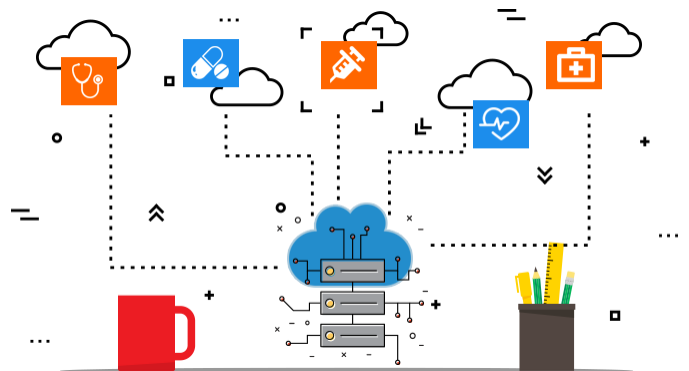


Figure 1. The proposed architecture: Appropriate applications deployed on the Cloud provide the essential communication channels for sensors, caregivers and stakeholders.

Each correspondence that happens between the Cloud foundation and the remainder of the parts is secure by applying fitting verification and information encryption components. Sensors can be validated by novel id and information can be scrambled utilizing symmetric encryption procedures ([19]). Clients and outer applications can be confirmed utilizing progressively complex components like PKI and advanced marks ([20]).

The real highlights of the proposed engineering are its versatility, interoperability and lightweight access. It is adaptable because of the way that it depends on a Cloud framework that gives assets dependent on use and request. More clients, sensors and other information sources can be

included without influencing the usefulness of the framework or without the requirement for further upkeep or development. The webservices based interfaces guarantee the most extreme interoperability with outside applications. The Representational State Transfer (REST) API is lightweight and can be effectively gotten to and actualized by remote sensor and portable stages. REST has additionally been proposed as a correspondence instrument for IoT applications ([25], [26]) and is the essential interfacing innovation behind built up IoT stages like Pachube, Nimbits and ThingSpeak.

V. CLOUD COMPUTING HEALTHCARE REVIEW

Chang et al. [2009] break down cloud medicinal services administrations dependent on the standards of practical environmental frameworks, derive highlevel prerequisites and give a biological system investigation of a few developing social insurance biological systems, e.g., radiology picture information organize, electronic therapeutic/wellbeing record [EMR/EHR] and PHR environments.

Wang and Tan [2010] consider a cloud-based stage to furnish social insurance associations with programming administrations, a program improvement condition and equipment and computational assets.

Wang [2010] human services administrations embraced in cloud suppliers coordinate a financially savvy idea where patients and wellbeing associations take points of interest of this new innovation by improving patient's nature of administration through a circulated high-incorporated stage organizing of therapeutic procedure just as lessening IT framework speculation or support costs which prompts a superior medicinal services condition.

Wang X [2010] proclaimed a human life is valuable, and the offices of the medicinal assets are confined. Thusly, human administrations organizations grasped in cloud providers facilitate a down to earth thought where patient's prosperity related adventure this development by improving persevering nature of organization through a coursed high joined stage which planning of medicinal procedure and moreover diminishing IT base of endeavor or upkeep cost which prompts a prevalent human administrations condition.

Huang et al. [2011] propose cloud-based PACS [Picture Archiving and Communication System] to disentangle the trading of DICOM pictures between human services suppliers.

Kuo [2011] HIPAA consistence is the most crucial necessity when moving therapeutic records to the cloud. Relocating whole information stockpiles to an outsider association isn't a simple errand to do, particularly when moving touchy data, for example, social insurance information. Considerably progressively vigorous security ought to be guaranteed in light of the fact that more concerns will emerge with access controls, review controls, confirmation, approval, transmission security and capacity security so as to abstain from presenting the data to unapproved substances. These issues are a snag that have hindered the cloud appropriation and ought to be tended to so as to empower the reliability of cloud frameworks. Luckily, huge numbers of the greatest cloud suppliers in the market, for example, Microsoft, Google, and Amazon have duties to build up the best approaches and practices to verify a client's information and protection.

Deng et al. [2011] center around home human services applications, especially to help discouraged patients, and present a cloud-based framework structure for home social insurance giving medication treatments, rest and light, and physical action the board and different administrations. The creators determine security and protection prerequisites applying business rationale and design driven methodologies, sketch out an arrangement to incorporate the proposed engineering into a cloud, and give primer proposals for wellbeing information insurance.

Deng et al. [2012] represent the home checking and prosperity gateway applications observing the patient's information transferred by means of a cell phone to the cloud and offering it to restorative laborers for further directions on need or request.

Al Masud and Rashid S. M. [2012] as indicated by him moving towards distributed computing in the social insurance framework is the superlative development because of the emanant number of the electronic document which adds to raising of a few unsolvable issues.

Sanjay P. A., Sindhu M., and Jesus Z. [2012] referenced IT cost which generally exposed vigorously by social insurance area can be decreased fundamentally when moving towards distributed computing which can be seen right away. Moreover, receiving to cloud model will cause movement of all the IT procedures to the framework of distributed computing where the procedures will be put away and performed all the more adequately and absolutely. Fundamentally, the most recent model which referred to as "pay-as-you-move" enables associations to pay just for what they use or actualize. To put as such, the affiliations won't have a specific clarification behind getting exorbitant gear

foundation, programming warrants or to keeping site staff for upkeep, security, and replications. This is as the cloud offers bundles which take care the reasons which might be faulty from the individual associations.

Berndt et al. [2012] present the FEARLESS [Fear Elimination as Resolution for Loosing Elderly's Substantial Sorrows] task to help older individuals in their self-serve exercises by identifying a wide scope of dangers with a sensor [e.g., fall]; the versatile diabetes [M-Diab] and portable skin [M-Skin] frameworks to help the treatment and aftercare of patients experiencing diabetes and skin illnesses, separately; and the eHealth-MV [eHealth-Mecklenburg Vorpommern] venture to gauge and screen the pressure and wellness level dependent on physiological sign accumulated through remote sensors.

Vazhenin [2012] presents the engineering of a cloud-based data recovery administration [e.g., DICOM] for a wide scope of gadgets and gives execution proportions of the actualized arrangement.

Basu et al. [2012] present a cloud-based Fusion stage sharing EHRs safely and amassing de-recognized information to help examination applications.

Fernández-Cardeñosa et al. [2012] examine the utilization of an EHR the executive's framework for an enormous emergency clinic and a system of essential human services focuses and infer the plausibility of a half and half arrangement suggesting the capacity of the EHRs with pictures in medical clinic servers and the rest in the cloud.

S. Duty [2012] The EMR can be put away in a CD and downloaded onto a PC. On the off chance that the EMR is cloud-based, it very well may be gotten to from a PC at some other geographic area. For instance, amidst disastrous occasions, numerous human services suppliers can proceed with indispensable patient consideration and keep fundamental correspondence utilizing the EMR cloud. Shockingly, during a storm, doctors could at present utilize the EMR cloud for charging, composing and transmitting medicines, checking persistent drug records, and counseling with the patient pretty much the entirety of their ailments.

Jaswanthi et al. [2013] Recent security assurance courses in social insurance distributed computing incorporates into Hybrid Execution Model, Vehicular Cloud Computing [VCC] Service-situated Security Framework [VCC-SSF], sHype

Hypervisor Security Architecture, Identity Management, and Resource Isolation approaches. Another execution model for security insurance in distributed computing is the Hybrid Execution model. This model gives a brought together path to an association to use their own framework for delicate, private information and calculation.

J. Rajendran [2013] When patient data is put away in the cloud, therapeutic suppliers can get to lab and radiology results just as some other relevant test results during whenever outline and at any area. For home wellbeing medical caretakers, the cloud attempts to further their potential benefit, giving them prompt access to continuous information, empowering them to report visits and outline refreshes progressively also, discharging them from the tedious every day synchronization schedule. Distributed computing offers data which is all the more promptly open to the supplier and supports clients with the goal that the crisis room [ER], emergency unit, different medicinal nursing units, auxiliary divisions, for example, lab and radiology, and different offices, for example, an appended nursing home for instance, etc, approach a similar sort and measure of data. This continuous access and promptly open data results in quicker reaction for data demands, improved consideration coordination, better basic leadership, and a higher quality patient consideration.

Safa et al., [2015] The social insurance industry is a profoundly trained condition and the idea of distributed computing foundations—sharing programming and servers and conveys by means of Internet—expands worries about protection, security, access and consistence. Sharing restorative and individual data past the safe milieu of the human services association, and getting to it by an accumulation of gadgets and from different locales, prompts numerous consistence issues. Web based virtual framework is an enormous framework with extraordinary potential for data security ruptures. Digital assaults and absence of learning of approved clients are the significant dangers in the human services frameworks. Programmers utilize different strategies to change secrecy, respectability, and data availability, while clients deliberately or through carelessness are a huge peril for data security.

Kang et al., [2015] Vehicular Cloud Computing [VCC] Service-arranged Security Framework [VCC-SSF] to address the constraints and security dangers is the other route for insurance of social insurance distributed computing. This structure considers security for appropriate and productive administrations of VCC and incorporates new client situated installment the executives and dynamic mishap the executives administrations. Besides, it gives validation, encryption, get to control, classification, trustworthiness, and security insurance for client individual medicinal services information.

VI. CONCLUSION AND FUTURE SCOPE

cloud computing is another model of processing that guarantees to give greater adaptability, not so much cost, but rather more proficiency in IT administrations to end clients. It offers potential open doors for improving EHR appropriation, medicinal services administrations, and research. However, as talked about above, there are as yet numerous difficulties to cultivating the new model in social insurance. Maybe the most grounded protection from the selection of cloud computing in wellbeing IT focuses concerns information security and legitimate issues. Luckily, numerous primary suppliers (eg, Microsoft, Google, Amazon) have duties to grow best arrangements and practices to verify client's information and protection [28-30].

VII. REFERENCES

1. Chitra DD, Uthariaraj VR. Load balancing in cloud computing environment using Improved Weighted Round Robin Algorithm for nonpreemptive dependent tasks. *The Scientific World Journal*. 2016; 2016.
2. Bibin K Onankunju, (2013) "Access Control in Cloud Computing", *International Journal of Scientific and Research Publications*, Vol. 3, No. 9.
3. K.shirisha reddy, Dr. M.Balaraju (2012) "An integrated approach of data storage and security in cloud computing" *international journal of application or innovation in engineering & management (IAJEM)* volume 1, Issue 4.
4. WHO Centre for Health Development (Kobe, Japan). (2004). A glossary of terms for community health care and services for older persons. Kobe, Japan : WHO Centre for Health Development. <http://www.who.int/iris/handle/10665/68896>
5. Lingkiswaran D, Sugalia S Sekaran and Rajermani T (2017) CLOUD COMPUTING IN HEALTHCARE *International Journal of Students' Research In Technology & Management* Vol 5, No 1, pp 25-31, ISSN 2321-2543.
6. Bamiah, M., Brohi, S., Chuprat, S., & Ab Manan, J. L. (2012). A study on significance of adopting cloud computing paradigm in healthcare sector. In *Cloud Computing Technologies, Applications and Management (ICCCTAM)*. International Conference on IEEE, pp. 65-68. <https://doi.org/10.1109/iccctam.2012.6488073>
7. Cloud Standards Customer Council, (2012). Impact of Cloud Computing on Healthcare, White Paper. Retrieved from <http://www.cloudcouncil.org/deliverables/CSCC-Impact-of-Cloud-Computing-on-Healthcare.pdf>
8. Rolim, C. O., Koch, F. L., Westphall, C. B., Werner, J., Fracalossi, A., & Salvador, G. S. (2010). A cloud computing solution for patient's data collection in healthcare institutions. In *e-Health, Telemedicine, and Social Medicine, ETELEMED'10, Second International Conference on IEEE*, pp. 95-99.
9. De la Torre-Díez, I., Díaz-Pernas, F. J., Fernández, G., Antón-Rodríguez, M., Martínez-Zarzuela, M., González-Ortega, D., & Boto-Giralda, D. (2012). Analysis of the benefits and constraints for the implementation of Cloud Computing over a EHRs system. In *Proceedings of the 6th Euro American Conference on Telematics and Information Systems*, pp. 151-156. <https://doi.org/10.1145/2261605.2261628>
10. Chang, H. H.; Chou, P. B.; Ramakrishnan, S. (2009) An Ecosystem Approach for Healthcare Services Cloud, in *Proceedings of the IEEE International Conference on e-Business Engineering*.
11. Wang, X.; Tan, Y. (2010) Application of Cloud Computing in the Health Information System, in *Proceedings of the International Conference on Computer Application and System Modeling*.
12. Wang, X. (2010), Application of Cloud Computing in the Health Information System. *Computer Application and System Modeling (ICCASM)*. Retrieved from <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=5619051>
13. Huang, Q.; Ye, L.; Yu, M.; Wu, F.; Liang, R. (2011) Medical Information Integration Based Cloud Computing, in *Proceedings of the International Conference on Network Computing and Information Security*.
14. M.-H. Kuo, A. Kushniruk and E. Borycki, — Can Cloud Computing Benefit Health Services? – A SWOT Analysis || , *User Centred Networked Health*

- Care, A. Moen et al. (Eds.), IOS Press, pp.379-383, 2011.
15. Deng, M.; Petković, M.; Nalin, M.; Baroni, I. (2011) A Home Healthcare System in the Cloud - Addressing Security and Privacy Challenges, in Proceedings of the IEEE 4th International Conference on Cloud Computing.
 16. Deng, M.; Nalin, M.; Petković, M.; Baroni, I.; Marco, A. (2012) Towards Trustworthy Health Platform Cloud, Secure Data Management, Lecture Notes in Computer Science, 7482, 162-175.
 17. Al Masud, & Rashid, S. M. (2012). A Novel Approach to Introduce Cloud Services in Healthcare Sectors for the Medically Underserved Populations in South Asia. *International Journal of Engineering Research and Applications*, 2(3), pp. 1337-1346.
 18. Sanjay, P. A., Sindhu M., & Jesus Z. (2012). A Survey of the State of Cloud Computing in Healthcare, *Network and Communication Technologies*, 1(2).
 19. Berndt, R-D.; Takenga, M. C.; Kuehn, S.; Preik, P.; Sommer, G.; Berndt, S. (2012) SaaS-Platform for Mobile Health Application, in Proceedings of the 9th International Multi-Conference on Systems, Signals and Devices
 20. Vazhenin, D. (2012) Cloud-Based Web-Service for Health 2.0., in Proceedings of the Joint International Conference on Human-Centered Computer Environments.
 21. Basu, S.; Karp, A.; Li, J.; Pruyne, J.; Rolia, J.; Singhal, S.; Suermondt, J.; Swaminathan, R. (2012) Fusion: Managing Healthcare Records at Cloud Scale. *IEEE Computer Special Issue on Move Toward Electronic Health Records*.
 22. Fernández-Cardenosa, G.; de la Torre-Díez, I.; López-Coronado, M.; Rodrigues, J. J. P. C. (2012) Analysis of Cloud-Based Solutions on EHRs Systems in Different Scenarios. *Journal of Medical Systems*, 6.
 23. S. Levy, — Healthcare Clouds Have a Silver Lining...Even in a Hurricane || , *Hudson Valley Business Journal*, pp. 3-4, November, 2012.
 24. Jaswanthi, B., & NaliniSri, M. (2013). Confidentiality and Privacy in Cloud Computing using Hybrid Execution Method. *International Journal of Science and Modern Engineering*, 1(5), 84-89.
 25. J. Rajendran, — What CFOs should know before venturing into the cloud || , *Healthcare Financial Management*, pp. 40-43, May 2013.
 26. Safa, N. S., Sookhak, M., Solms, R. V., et al. (2015). Information security conscious care behaviour formation in organizations. *Computers & Security*, 53, 65-78. <http://dx.doi.org/10.1016/j.cose.2015.05.012>
 27. Kang, W. M., Lee, J. D., Jeong, Y. S., & Park, J. H. (2015). VCC-SSF: Service-Oriented Security Framework for Vehicular Cloud Computing. *Sustainability*, 7, 2028-2044. <http://dx.doi.org/10.3390/su7022028>
 28. Microsoft Corp. 2010 Nov. Privacy in the Cloud: A Microsoft Perspective URL: <http://www.microsoft.com/privacy/cloudcomputing.aspx> [accessed 2011-09-07] [WebCite Cache ID 61WdQxiyd]
 29. Google Privacy Center. Google. 2010 Oct 3. Privacy Policy [accessed 2011-08-06] [WebCite Cache ID60kO3Cyfl]
 30. Amazon Web Services. 2008 Oct 01. AWS Privacy Notice URL:<http://aws.amazon.com/privacy/> [accessed 2011-08-05] [WebCite Cache ID 60kO4Fxhu]