International Journal of MC Square Scientific Research Vol.9, No.4, 2017

Health Observation System Using Cloud Computing

Fuhaid Aldossary
UG Student, Department of Information Technology and Security,
Jazan University, Jazan, Saudi Arabia.
Email: fuhaidfuhaidaldossary@gmail.com

Abstract

Mobile Health Observing systems (MHOS) face additional challenges in personalized health records processing than general medical services provided within hospitals. To achieve custom-made and high - quality health observation, new technologies are developed, such as mobile system along with the cloud based computing system. In this paper, a skeleton of Mobile Health observing system based on a cloud computing (Cloud - MHOS) is considered. Moreover, the elements of the structure, which are Cloud Storage, Healthcare Data explanation Layer, several Tenants Access Control Layer, and Health checkup records Analysis Layer, are conversed. In the layer of data storage, a several tenant access technique is intended to defend patient privacy preserving. In the data clarification layer, linked open data are adopted to augment health records inter-operability semantically. In the records analysis layer, the process mining algorithm and parallel calculating system are implemented to support personalized handling plan selection. These three modules work together in performing the heart functions in the process of health observing, which data are processing, data storage, and information analysis. Finally, that studies the application of our operation in the observing of procedure to display the usability of method in personal health checkup analysis.

Keywords: Hospital information system, Mobile Health Observing system, Interoperability, linked data, cloud computing.

1. Introduction

The elevated procedures of the promising mobile Internet along with Internet of Things (IoT) in manufacturing have altered the method that data is stored, acquired, delivered as well as accessed. It directs to the increase of mobile health (M-Health) systems, which aspire to not only improve the capacity of doctors to observe as well as care for difficult illness at remoteness suitable. But as well trim down the transportation expenditure on the hospital's part as well as the cost on the patient's part efficiently. To authenticate helpful information as well as to develop the capabilities to detect along with follows diseases anytime as well as anywhere. The health

records together by checkup devices, such as blood-glucose measuring devices, sphygmomanometers, as well as portable sensors at house and the public sanatoriums, which replicate people's day by day health conditions. During the earlier period decade, there has been fast development in advanced health observing methods as well as methods to assist.

Categorization of Health Observing Systems (HOS), where Wearable Health Observing Systems (WHOS) is wearable health checkup observing the system, MHOS is mobile health observing the system along with RHOS is a remote health observing system. They can be used in hospital, housing as well as outdoor settings by either Radio Frequency Identification technology (RFID) or global positioning system. Figure 1 shows the types of HOS.

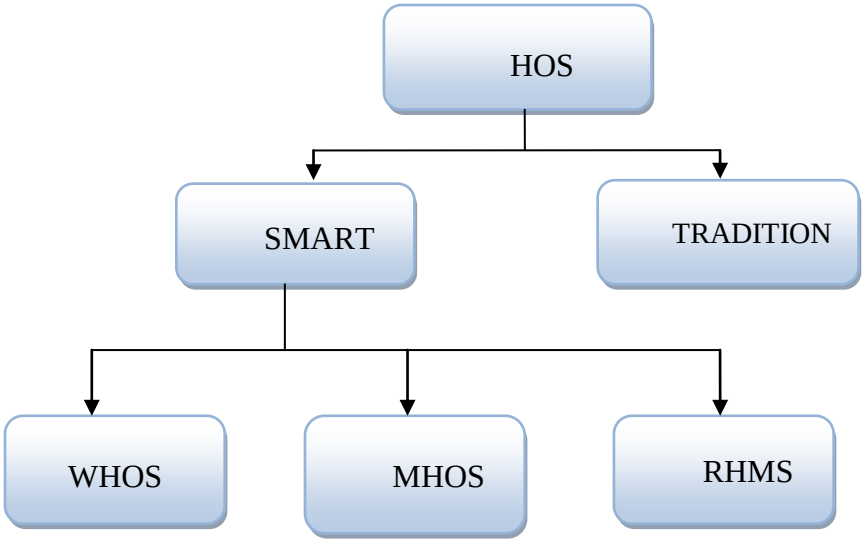

Figure. 1 Types of HOS

1.1 WHOS:

The smart vest device is basically a wearable physical observing system, integrated with a vest. A diversity of sensors included addicted to the garment's stuff concurrently gathers bio-signals in a non - invasive along with inconspicuous system. The constraints considered via the vest contain blood pressure, electrocardiogram, photoplethysmography, cadaver fever and galvanic skin response.

1.2 Remote Health observing system (RHOS):

RHOS is defined as utilize of electronic data along with message equipment to maintain as well as improve the excellence of health checkup when remoteness divides the health checkup professionals as well as patients. RHOS regularly convey the vital patient information as of a distant position to the clinicians in real - time by means of complex data along with message technology.

1.3 Mobile health observing system:

A multi-agent structural design containing of clever agents for cardio along with load observing, supported on portable equipment, has been urbanized to collect patient records. Intellectual managers together fling analytical data along with suggesting checkup interference in a compact location.

2. Related Works

In [1], elegant fitness monitoring systems through the contact tools are explained, the largest part of these systems utilize like Behavioral models among various adjustments to the software as well as equipment. The replica can be second-hand for special setting among various adjustments along with has proved pretty capable for most portable fitness monitoring systems. In [2] our successive evaluation revealed that for applications such as epidemiological observation, our III framework provides numerous benefits relative to the client-server EHR systems, as well as better scalability, quicker development, with lower cost. In [3], the clever consumption of individual mobile information is standard fitness services described modified m-Health method includes primary the patient's health check sensor system (HSN). To maintain the check intellect, then utilizes the pattern of the elegant place through its leading knowledge's accepted since the Internet of Things as well as Semantic Web.

In [4] Mobile Cloud based multifarious source portion replica (MC-HSPM), which is planned to reduce the implementation instance. The primary rules used in dynamic assorted Task coursework algorithm. Our new assessment has shown that our planned scheme has a benefit of economy implementation time. In [5] Enhanced m-Health Services has discussed structural design supported on cloud computing system paradigms to authorize fresh m-Health functions to improve their consequences by provided that protected permission to customer records. In [6] Ad Hoc Mobile Cloud Computing knows how to preserve position isolation for the portable procedure even as given that useful services through small configuration operating cost.

In [7] Cloud-Based Smart Health observe System platform supported the medical conclusion by dispensation Tele - checked records along with provided that a speedy and exact risk assessment of vascular measures along with cascade. In [8] these design enhanced reserve allotment in the MCC atmosphere throughout resourceful assignment allocation as well as offloading, safety along with isolation. In [9], this method implements predictable computerized mechanisms, is defined Filtered Wall (FW), to sift disposed of communication from OSN client satisfied. In [10] Data mining process approaches are used to take out the existing data from DNA microarray with the assist of the multi-statement analysis device. Dual-Tree M - group Wavelet convert is working for the taking out of facial appearance from the known dataset at the 2nd stage of corrosion. In [11], the result indicates that members who were small on impulsivity fared most terrible on IGT task evaluated to the participants who were elevated on impulsivity. The same outcome was established for character traits and information dealing out styles. In [12] to show that our structure holds these properties based on the calculation Diffie–Hellman

supposition as well as the rewindable black-box information extractor. A well-organized method resting on probabilistic questions as well as episodic authentication is planned to decrease the inspection expenses per authentication as well as implement irregular detection timely. In [13] the machine aspires to get better the worth of time for the sightless as well as visually impair citizens and makes they know their environment in an apparent method as close as to a usual person at a reasonable cost. In [14] after segmentation calculate to diagnose glaucoma. The structure is applied to a total of 45 images, and the results indicate the ability of the method for automatic mass screening to analyze glaucoma at the earliest. In [15] Results show that the glaucoma diagnosis method has 92% specificity, 96% sensitivity, and 94% correctness using 100 fundus images of usual and glaucoma cases.

3. Proposed method

Mobile Health observing methods are urbanized as a synergy of promising movable medical services, portable message devices along with mobile technologies. The IoT - based technologies, jointly among mobile devices as well as their applications, have been rising gradually in a lot of areas, together within health check services. The proposed method of the cloud computing based Mobile Health Observing System (Cloud-based - MHOS) is separated into three layers, that is the Cloud-based Storage along with several Tenants Authentication Control Layer, Health checkup record explanation Layer, along with Health checkup records Analysis Layer.

The Cloud Storage system, along with several Tenants Authentication manage Layer supplies health checkup records calculated through elegant devices such as blood-glucose measuring devices, sphygmomanometers, etc. in patients' day by day actions. To every one of above authentication these reports for inaccessible health checkup observing, the cloud structure is accepted in our explored to gather along with organizing patients' connected record. Health checks up records can be moved to the cloud system part via the Internet. Toward assurance protection and secure the privacy of patients' records, several tenant access control is intended to realize records separation and distribution. Figure 2 shows the process of MHOS.

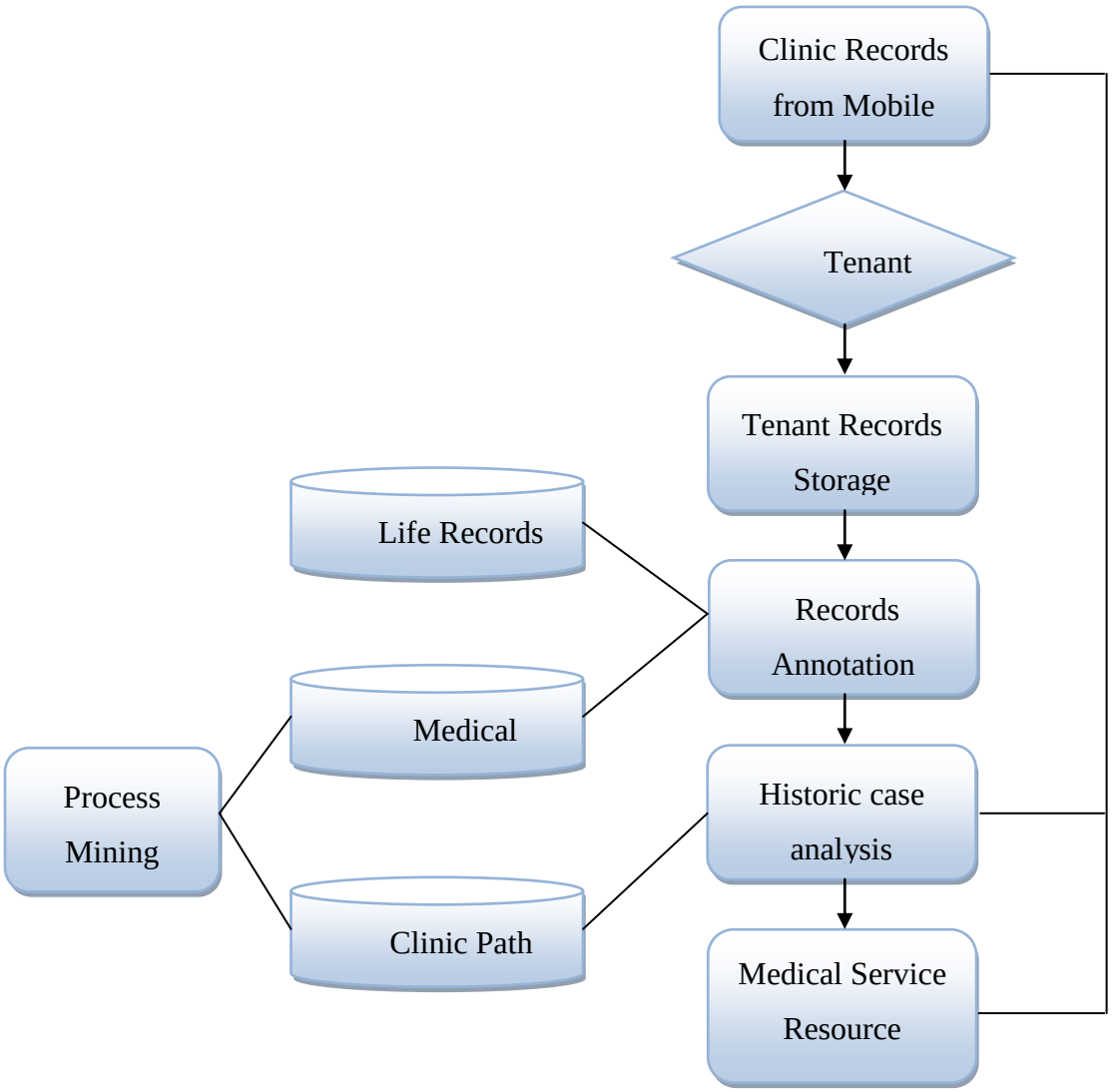

Figure. **2 Process of MHOS**

The Health checkup records Annotation Layer resolves the difficulty of records heterogeneity come across in health checkup records dispensation. Because checkup services are approved out through a variety of hospitals, records produced by HISs are frequently different.

This guides to the simplicity of automatic health checkup records thoughtful between special health checkup organizations. For occasion, the laboratory result of patients in one sanatorium generally couldn't be unstated by the information systems of additional sanatoriums. If health checkup records couldn't be interoperated among unusual HISs, reduplicated health check assessments force decrease effectiveness as well as amplify the fee of health check service

delivery. Consequently, semantic health checkup records combination is serious for records investigation. In this explore explain, release Linked Data (LD) set is used to explain individual health checkup records to incorporate isolated records in a patient - centric model for more cloud computing applications.

The Health checkup records investigation Layer first analyses all records and health checkup record stored in the cloud storage to maintain individual medical results. In experimental results hold, resembling historical records are valuable knowledge for treatment arrangement collection. The health checkup process mining algorithm used to bring hospital paths from individual health checkup records. The parallel estimate method is planned to balance patients' health checkup records to decide comparable patients as of historical records. Health check services are summarized as well as energetically allocate to carry out health check services if urgent conditions are watched. If irregular records are noticed, patients could be conversant in getting the correct proceedings, as well as checkup, ensure property, such like ambulances and vans, would be send to receive fast reactions to the healthiness observing systems. The proposed structure can be applied to get together different health checkup difficulty leaning on service - oriented structural design as well as cloud computing storage platforms on which health check property could be summarized as configuring Web app services.

4. Result and discussion

The topics apropos IoT, portable technology, with data analysis report supported on cloud computing has concerned a lot of awareness from practitioners as well as researchers in the health checkup business. A variety of Healthcare observation methods have been proposed as well as urbanized to support everyday health observing before developing health check rescuing. Now talk about the presentation of, security, scalability, interoperability, flexibility, mobility, medical decision making support, as well as consumer-oriented in Health checkup systems by evaluating our method, Cloud based-MHOS, with numerous other Health checkup proposals. In Health checkup methods, the result maintains functions are critical to end - users. Many ways have been discovered to expand the medical result maintain capability of Mobile Health checkup systems.

However, with the purpose of IoT technology as well as mobile devices in health check services, rapid records gathering has brought courageous to chance for developing medical result maintain via big data processing technique. Particularly, for elder citizens, otherwise, patients who have the constant disease, many records produced by schedule physical condition observing are further momentous to medical result prediction support. Indifference to the unambiguous knowledge-baseded system and Ontology Model-based System, our system, Cloud - MHOS, tries to extract along with share understood know-how experiences concealed in momentous health cases, which are more spontaneous for decision - makers. Table 1 shows the comparison with other methods in HOS.

Table 1 Comparison with observation of other methods

Benefits	**Cloud - MHMS**	**Knowledge - based method**	**Ontology Model-based method**
Flexibility	Service-Oriented structural design, High flexibility	module based structure, Medium flexibility	Embedded System Devices, Low flexibility
Security	Tenant Isolation, Medium level security	Not Discussed	Low-level security
Scalability	Cloud Computing, High scalability	Component-based A framework, Medium scalability	Embedded System, Low scalability
Mobility	Cloud Computing, High mobility	portable Devices along with with Wireless Network, High mobility	High mobility, RFID
Users Oriented	Associated Healthcare organizations	Individual Hospitals by elegant health Devices	Smart Home-based Healthcare organization
Clinical result maintain	Process Mining as well as Case-baseded analysis, High level	Rule-based analysis, Medium level	Low level, Ontology as well as Context Management
Interoperability	Open Linked information, High	Component-baseded Framework, Low	Embedded based System, Low

.

6. Conclusion

To bring away health check services in an urgent situation before to fast react to the relocating of patients as of one sanatorium to a new at any time, strange health situations are noticed. Available health check property is presented in the planned Cloud-MHOS structure to direct health groups to assign medical resources energetically. The case study of health checkup observes antimicrobial medicine habits observing of the planned method reveal that it offers important litheness to get together the supplies of on-demand, out hospital healthcare observing. It moreover provides move toward to support medical management above a big data setting caused through the use of IoT as well as portable Internet technology.

References

1. Baig, Mirza Mansoor, and Hamid Gholamhosseini. "Smart health monitoring systems: an overview of design and modelling." Journal of medical systems 37, no. 2 (2013): 9898.
2. Bahga, Arshdeep, and Vijay K. Madisetti. "Healthcare data integration and informatics in the cloud." Computer 48, no. 2 (2015): 50-57.
3. Korzun, Dmitry G., Ilya Nikolaevskiy, and Andrei Gurtov. "Service intelligence support for medical sensor networks in personalized mobile health systems." In the Internet of things, smart spaces, and next-generation networks and systems, pp. 116-127. Springer, Cham, 2015.
4. Chen, Longbin, Yucong Duan, Meikang Qiu, Jian Xiong, and Keke Gai. "Adaptive resource allocation optimization in heterogeneous mobile cloud systems." In 2015 IEEE 2nd International Conference on Cyber Security and Cloud Computing, pp. 19-24. IEEE, 2015.
5. Fernandez - Llatas, Carlos, Salvatore F. Pileggi, Gema Ibañez, Zoe Valero, and Pilar Sala. "Cloud computing for context-aware enhanced m-Health services." In Data Mining in Clinical Medicine, pp. 147-155. Humana Press, New York, NY, 2015.
6. Gong, Yanmin, Chi Zhang, Yuguang Fang, and Jinyuan Sun. "Protecting location privacy for task allocation in ad hoc mobile cloud computing." IEEE Transactions on Emerging Topics in Computing 6, no. 1 (2015): 110-121.
7. Melillo, Paolo, Ada Orrico, Paolo Scala, Filippo Crispino, and Leandro Pecchia. "Cloud-based smart health monitoring system for automatic cardiovascular and fall

risk assessment in hypertensive patients." Journal of medical systems 39, no. 10 (2015): 109.

8. Rahimi, M. Reza, Jian Ren, Chi Harold Liu, Athanasios V. Vasilakos, and Nalini Venkatasubramanian. "Mobile cloud computing: A survey, state of art and future directions." Mobile Networks and Applications 19, no. 2 (2014): 133-143.
9. Prakash, Gyan, Nishant Saurav, and Venkata Reddy Kethu. "An Effective Undesired Content Filtration and Predictions Framework in Online Social Network." International Journal of Advances in Signal and Image Sciences 2, no. 2 (2016): 1-8.
10. Sonawane, Jayesh Manohar, Shrihari D. Gaikwad, and Gyan Prakash. "Microarray data classification using dual-tree m-band wavelet features." International Journal Of Advances In Signal And Image Sciences 3, no. 1 (2017): 19-24.
11. Prakash, Gyan, and Azizuddin Khan. "Investigate the Role of Impulsivity in Decisions Making During Gambling Task: Case Study." International Journal of MC Square Scientific Research 4, no. 1 (2012).
12. Prakash, Gyan, Bhaskar Vyas, and Venkata Reddy Kethu. "Secure & Efficient Audit Service Outsourcing For Data Integrity In Clouds." International Journal of MC Square Scientific Research 6, no. 1 (2014): 5-60.
13. Khan, Azizuddin, and Gyan Prakash. "Design and Implementation of Smart Glass with Voice Detection Capability to Help Visually Impaired People." International Journal of MC Square Scientific Research 9, no. 3 (2017): 54-59.
14. Ganesh babu, T. R. "Computer-aided diagnosis of glaucoma detection using digital fundus image." International journal of advances in signal and image sciences 1, no. 1 (2015): 1-11.
15. Ganeshbabu, T. R. "Glaucoma Image Classification Using Discrete Orthogonal Stockwell Transform." International journal of advances in signal and image sciences 3, no. 1 (2017): 1-6.