Remote Healthcare Monitoring System using Ontology

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Abstract — Patients health monitoring process using the Webservice & Combination of Ontology, Rules. The two layers which are designed to describes the task of healthcare monitoring, Service Handling layer, Data & Communication layer are the two different layers. The Patients are monitoring and getting health-care alerts remotely from home. Data & Communication layer using REST WS technique used to provide data communication and remote data management. Service Handling layer provides healthcare remainder for patients, health updates with server. Service handling layer also guide the user to uses self-caring device under the guidance of certified doctor and Physician/Technician.

**Key words:** Telemonitoring Scenarios, Management, Ontologies, Representational State Transfer (REST), Web Services

I. INTRODUCTION

Remote Health care monitoring system provides remote healthcare data handling features as home-based system. Healthcare details of patients transferred and maintained with secured, advanced data & service handling system by using the information & Communication technologies. Because of population growing the Tele-Monitoring System facing problem in Medicine Delivery Process and need to be addressed Quality improvement in Patient Empowerment & Medical data communication.

Fig. 1:

Patient’s health status is registered regularly by using the health checking device which is connected with secured database. Home based health caring system with database for store daily health information provide advanced data managing feature, that protect the system from data report with invalid or uncompleted data. At Server side WS the Health-Care System contains the remote data accessing system with strong healthcare database of certified doctors.

An Ontology-Driven Architecture used for data management and integrate, also enable communication between the server and health care system as Remote-monitoring Scenario. The Remote-Monitoring Scenario provides the Clinical Data Management and also Technical Data Management of all devices connected with the network.

Fig. 2:

Provide two important Services. Home-based remote health monitoring service provides client side utilities. Healthcare system that provides the server side service. At Home site the data acquired by using Medical Devices together with the patient’s feedback are gathered in a HG (concentrator device) used to evaluate and transfer the data to outside the patient’s home if necessary.

Home Site as well as to manage and store the patient’s monitoring guidelines defined by physicians (Tele-Monitoring Server). Tele-Monitoring Process, and consequently the Evolution of The Patient’s Health Status is managed through the indications or monitoring guidelines provided by Physicians. Server side Healthcare system receive the information from the Home site. Although significant contributions have been made in this field Telemedicine & Health Scenarios needs to be addressed by researchers.

Interoperability and Integration are critical challenges that also need to be addressed when developing Monitoring Systems in order to provide effective healthcare and to make possible seamless communication among the different heterogeneous health entities that participate in the monitoring process.

II. ARCHITECTURE

The Healthcare Monitoring architecture required to address research and Technical Level challenges. All Medical Device (MD) comprise the Health Monitor Scenario that is important task that may integrated under the same architecture. And the healthcaring system architecture have Technical Management and also Clinical Management.

An Ontology based architecture used for integrated data management & also enable its communication in a Remote Health monitoring Scenario. The Patient’s Clinical Data Management provides the clinical support and guidelines of health caring with patient. Clinical data that
assure direct interaction on patient Health Monitoring Mecial Device and that will get the feedback of the every individual. Technical Data Management allows the user to provides the high level of abstraction, representation & semantic integration. Health caring system that provides complete guideline about the health caring and maintaining. The patient disease and treatment details recorded in the secured database. The data can be accessed and handling with the secured data transaction between the database. On-time key generation techniques used for provides the secured data transaction and authentication. Whenever a user or patient entering and trying to get the information about personal caring or general health caring details needs to authenticate. When the user request for any data the user identity should be registered with personal details that will be compared with login database. The tested user can only complete the registration once if the registration is successful then the new key is generated for the data accessing. The lifetime of the key is valid for few hours only at the next login it need again new key generation.

III. SYSTEM SPECIFICATION

Tele-monitoring systems used to monitor and manage the patient health care information with the control/guidance of the physicians. The system face the problem of delivering medicine to the current growing population with chronic conditions while at the same time covering the dimensions of quality of care and new paradigms such as empowerment can be supported. Delivering medicine to the current growing population is Complexity, the quality of the health care need to improve, also need to improve Clinical data handling to more quality effective output.

A Flexible and Scalable Architecture in order to address main challenges presented in Home-Based Tele-monitoring scenarios and thus provide a means to integrate and transfer data supporting both clinical and technical data management. Seamless communication among the different health care entities. Guarantee Patient controls that is defined by Physicians. Reducing the Cost of Healthcare. Avoid the Hospital Overflow.

IV. BACKGROUND INFORMATION

Ontology-based solution of a technical system that combine the ontologies with the dynamic knowledge user rules. A system which using the rules means that should be uses set of if-then rules and also using a Rules Engine to apply the rules which are required. Behavior of the individuals can be expressed by using the rules. Rules allows to generate a new knowledge & can also used to provide other personalized service. SWRL is the one of the most popular languages for rules.

REST style is used for describes the web service. The WS which is implemented by using HTTP and principles of REST is designated as REST WS. Client request and Server response both are need to transfer the resource information. Resources identified through the URI. Exchange or resources are done by using the HTTP methods explicitly like PUT, POST, GET, etc. Stateless behavior of data with XML is key characteristics of REST WS. SOAP packages is avoided because of using REST WS and the Message payload decreased. For providing fast interation the REST WS using the HTTP protocol directly.

SPARQL is used to define rules. SPARQL is query language but it can be used as a Rule language that is possible by combining CONSTRUCT clause and FILTER restriction. CONSTRUCT query using the graph pattern by taking the specified graph template. FILTER clause can be used to restrict the solution. The solution to be included in solution sequence whenever the filter function evaluate to true.

REST WS style was choosen in order to improve flexibility. The resources based communication which is allowed the system to reuse the communication structure and that provide both clinical service and technical services for future modification of ontology.

Web services are used as Software Technology to exchange and access the information model by ontology. Web Service is a software system that is designed to supports interoperable machine-to-machine interaction over
the communication network. Systems may interact with the WS by exchanging SOAP messages serialized in XML for its message format. Messages sent over other application layer protocols by using HTTP. Although SOAP-based WS are the most popular types of web services other styles of programming also used such as the REST style.

Swing Components & Containment provides many standard GUI components like Buttons, Lists, Menus and Text areas. The components are combined for creating our GUI program. The GUI also includes containers such as tool bar and windows. In containers the size and position of the components can be determined by using layout managers.

V. EXPERIMENT ANALYSIS

Two management modules and web technology modules inside the HG and the TS constitute the main parts of the telemedicine system. The modules that comprise the architecture have been developed using Java technologies. Home Gateway that manage the interaction of the user and act as an interface between the user and the TS. The service provided to the client must be reliable and trusted at the end of TS. TS management module ensure that he secure and reliable communication between the patient and the Health care system.

VI. CONCLUSION

This project provides the secured communication of Health Care Service between the Home Based Health Care System and Health Care Tele Server with Quality Of Service that reduced the Hospital Overflow. And the result will be a complete Health Care System that useful for patient selfcaring utilities and monitoring, handling the Patient’s Health Records with the current populations. System provides the architecture of protected Patient Database Management System. The system provides all advanced facilities that interact with the current health care policies of the private and government facilities.

REFERENCES


