Developing a SOA-Based E-Healthcare Systems

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Abstract : Nowadays we are in the age of technologies and communication and there is no doubt that technologies such as the Internet can offer many advantages for many business fields, and the health field is no execution. In fact, using the Internet provide us with a new path to improve the quality of health care throughout the world. The e-healthcare offers many advantages such as: efficiency by reducing the cost and avoiding duplicate diagnostics, empowerment of patients by enabling them to access their medical records, enhancing the quality of healthcare and enabling information exchange and communication between healthcare organizations. There are many problems that result from using papers as a way of communication, for example, paper-based prescriptions. Usually, the doctor writes a prescription and gives it to the patient who in turn carries it to the pharmacy. After that, the pharmacist takes the prescription to fill it and give it to the patient. Sometimes the pharmacist might find difficulty in reading the doctor's handwriting; the patient could change and counterfeit the prescription. These existing problems and many others heighten the need to improve the quality of the healthcare. This project is set out to develop a distributed e-healthcare system that offers some features of e-health and addresses some of the above-mentioned problems. The developed system provides an electronic health record (EHR) and enables communication between separate health care organizations such as the clinic, pharmacy and laboratory. To develop this system, the Service Oriented Architecture (SOA) is adopted as a design approach, which helps to design several independent modules that communicate by using web services. The layering design pattern is used in designing each module as it provides reusability that allows the business logic layer to be reused by different higher layers such as the web service or the website in our system. The experimental analysis has shown that the project has successfully achieved its aims toward solving the problems related to the paper-based healthcare systems and it enables different health organization to communicate effectively. It implements four independent modules including healthcare provider, pharmacy, laboratory and medication information provider. Each module provides different functionalities and is used by a different type of user. These modules interoperate with each other using a set of web services.