DEVELOPMENT OF A PATHOLOGY INFORMATION SYSTEM USING MOBILE AGENT TECHNOLOGY

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ABSTRACT

This work developed and implemented a mobile agent based software for gathering pathology investigation results with a view to reducing the delay involved in the system.

The software developed was based on the waterfall model. The requirement analysis for the software developed was carried out by selecting pathologists in four hospitals. Focus group interviews were carried out to establish the existing procedure of pathology investigation result gathering. The modules identified after the focus group interview consisted of Configure, Search, Send report, Retrieve result and Update registration. These modules were designed using object oriented technique. The designed modules were implemented using the Java Programming Language, while its database was implemented using the Microsoft Access 2000 engine. The developed software was tested using rapid prototyping technique. The mobile agent based system developed was implemented and tested using four personal computers which run on heterogeneous platform and a bandwidth of 5kbps. The mobility feature enables mobile agent to migrate to remote hosts where information is stored to execute user's request autonomously. "The tested parameters in the interaction include Full Blood Count (FBC), Packed Cell Volume (PCV), White Blood Cell (WBC), isolate sensitivity to antibiotics like Penicillin G (Benzyl Penicillin), Ampicillin, Nitrofurantoin, Bilirubin Total, Conjugate Bilirubin, Calcium and Protein.

The result showed that for a single request, the transmission time was 1 second for both the proposed technique which is agent based and non-agent based technique for a bandwidth of 5kbps. However, for more than one request using the same bandwidth, the transmission time for the proposed model was 5 seconds as against the transmission time of 10 seconds for the non-agent based system. The proposed approach provides cost effective solution and generate lower server delay overhead which resulted into 98% efficiency as against non-agent system with efficiency of 55%. In addition, the designed and implemented agent based system has quicker retrieval of pathology investigation results from hospitals in the network.

It is concluded that this mobile agent based system is a recommendable infrastructure to facilitate collaboration among health care providers for effective diagnosis and treatment of patients.