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A Review on Intelligent Healthcare Supervision using Client-Server System

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Abstract: ***Mobile computing and technology is becoming prevalent in many aspects of private life and public services. This paper presents a discussion of the technology and its application in context of the health care service, and outlines some potential benefits that may result from its integration into existing information systems and architectures. The additional component of _mobility_ is believed to provide value to health care services, information systems and ultimately the patient's experience. We passionately dedicated to help medical fraternity to find health status of vital organs of the patient's body at early stage that support effective treatment by introducing innovative and high quality hand carried noninvasive health care systems and devices. Client-Server Health Care is the integration of mobile computing and health monitoring. The computing device enables the delivery of accurate medical information anytime anywhere by means of high speed internet. In this paper we present an Intelligent Healthcare Monitoring System, which can provide medical feedback/assistance to the patient through internet. .***

Keywords: Client-Server Health Care, Intelligent Healthcare Monitoring System, Medical fraternity, Mobile computing.

I. INTRODUCTION

Wireless network infrastructures, notably cellular networks, are becoming a vital element for exchanging electronic data in low income countries. Several key sectors are already leveraging and the health care sector is also aiming to tackle outstanding challenges like providing basic health care services to remote communities by using cheap mobile devices [1]. In many health care facilities, however, there exists a severe need for improvement in quality of service and patient waiting times. Normally when patients want to make an appointment with the hospital staff, it becomes really tedious and time consuming. These needs must be met with an efficient and practical solution. This solution must make use of internet resources, such as mobile health monitoring device, in the most efficient manner. It has also been shown that rising hospital expenses are the main factor for rising costs in patient healthcare [2]. Many patients with non-life-threatening illnesses needing health monitoring do not necessarily require hospitalisations – they simply require monitoring via a mobile system that encompasses intelligent capabilities to detect abnormalities, provide temporary advice and send urgent alerts to medical staff in the event of an emergency. In the realm of chronic illnesses such as diabetes in remote areas, there is even a shortage of rural diabetic specialists, which has long been one of the most important problems facing most countries in the world [3]. The fact that mobile health monitoring can bring to these sufferers an increased contact with specialists in cities improves the overall quality of health service. This paper presents a generic agent-based e-Health monitoring framework that is used to assist in the client to server interaction spanning multiple remote locations and hospitals.

II. RELATED WORK

Mobile health-monitoring devices offer great potential help for such patients who may be able to afford good healthcare without having to regularly visit their doctor. These technologies bring potential benefits to both patient and doctor; doctors can focus more on priority tasks while saving time normally spent with consulting with patients [4] and patients can move about in

their environment without having to make expensive trips to the doctor – especially if they reside in remote locations [2]. The ubiquity of mobile devices in both developed and developing countries presents an opportunity to improve health outcomes through the innovative delivery of health services and information.

In the present era of information technology, the wireless body area network has emerged as a new technology for e-healthcare that allows the data of a patient's vital body parameters and movements to be collected by small wearable or implantable sensors and communicated using short-range wired or wireless communication techniques. This has shown great potential in improving healthcare quality, and thus has found a wide range of applications from ubiquitous health monitoring and computer assisted rehabilitation to emergency medical response systems. Through the health monitoring system real-time and continuous triage information can be distributed to health care providers. Light weight and no-intrusive biomedical sensors like pulse oximeter and electrocardiogram are easily deployed for continuously monitoring of the vital signs of a patient and deliver the data to the first responders [3] [5]. Client-Server healthcare systems are regarded as a solution to healthcare costs without reducing the quality of patient care [7]. The integration of the existing specialized medical technologies with cell phones or personal computer is a very promising application in home monitoring, medical care emergency care and disaster response.

The general patient and doctor scenario is as follows:

1. Patient and doctor are brought together as a result of a patient complaint.
2. The doctor performs an investigation on the patient's condition. The doctor diagnoses the condition. Specialist collaboration and negotiation may be required.
3. The doctor collaborates with specialists and the patient to design a treatment plan.
4. The treatment is carried to completion and the patient's condition returns to normal.
5. The interaction concludes. Patient and doctor separate.
6. Occasional patient–doctor interaction:

† Patient seeks information from doctor.

† Doctor checks up on patient.

7. Until the next complaint when the cycle is repeated.

The main problem with the above scenario is that it does not work ideally. Most of the times the patient does not contact the doctors .Most of the time the reasons may be financial or the remote locations of the patient. On the other hand, the increasing pressure on the healthcare system because of an ageing population makes it impossible for patients to be hospitalized because of a lack of free beds in hospitals. If these chronically ill patients occupy all beds in hospital emergency departments, many severe cases (e.g. accidents) may be denied the required attention. Our design overcomes this problem where an intelligent agent assists each human role (patient, doctor, specialist and so on).

III. OUTLINE OF PROPOSED SYSTEM

The main objective of this health care system is to provide the most relevant diagnosis for a patient.

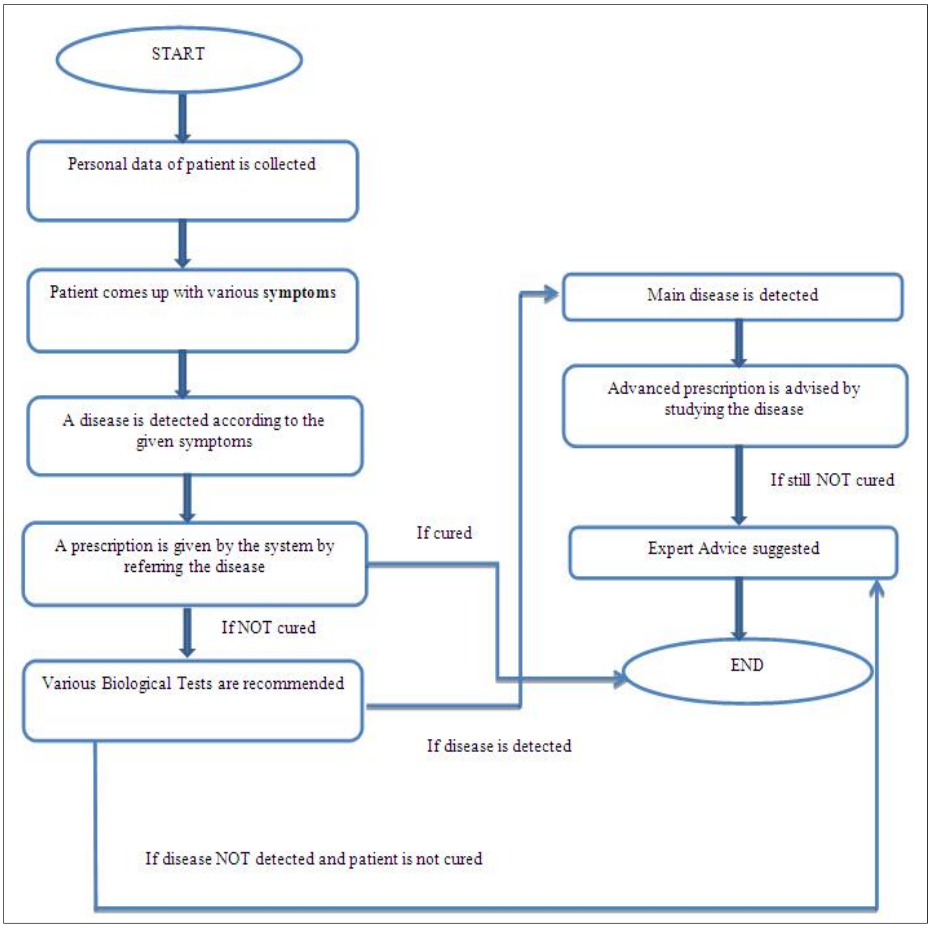

Figure 1 Dataflow graph of proposed system

The proposed system can be divided into the following STEPS,

i. Collection of Personal Data

Patient is asked for his/her personal information such as name, age, gender, weight, etc.

ii. Collection of Symptoms

Patient is asked for all the symptoms he /she is suffering from. Various choices are given to him/her and also a block is given at the end to give any extra symptoms.

iii. Diagnosing a disease

In this step, all the above symptoms are studied and an appropriate disease is diagnosed by the server.

iv. Giving a prescription according to the disease

In this step, a proper prescription is given to the patient according to the data available in the server.The patient is asked to take the medicines for an appropriate period and then asked to come for follow up. If the patient is recovered then the problem is solved but if not then he/she is asked to do various biological tests.

v. Biological tests

Biological tests such as various blood test, urine test, stool test etc.are asked to do for detecting the main disease and the patient is asked to put the results in the system.

vi. Detecting a disease by studying the test results

Here the disease is diagnosed according to the data feed in the system.The reports of the patient are studied accordingly.

vii. Providing prescription accordingly

Now according to the disease the prescription is provided to the patient. Again he is asked to take the medication for certain period. If the patient is still not cured after the medication then he/she is adviced to visit the Expert according to the list allocated in the system.

viii. Expert advice

The patient is provided with the contact details of the Expert to be contacted and the system session with the patient ends successfully.

Comparative Advantages and Disadvantages of the System

Advantages:

» As everyone knows prevention is better than cure so the main advantage is the continuous care is taken of the patient.

» The system is cost effective as the expenses of visiting the doctor is much more than online consulting.

» There is early detection of severe diseases during the treatment of the patient.

» Patients have access to high quality medical information(from medical teams at geographically remote locations).

» Patients are monitored remotely and efficiently.

» Patients often do not know if their symptoms are serious enough to see a doctor. Agents can help to identify patients who really need medical attention from those who only need information.

» There is better completion of treatment as compared to home remedies.

Disadvantages:

» The security of mobile agents is a major challenge to the design.

» Another drawback is possibility for Internet dysfunction altogether since it relies on the Internet as its data and information carrier.

IV. CONCLUSION

This application was built for providing vital connection between home healthcare and primary health care providers for making their work easier. The application is cost-effective and a boon for elderly people who find it difficult to come to the hospital and spend time for collecting the or prescriptions and also for people in remote areas. It also benefits the patients to make available the medical records while consulting different physicians at any given time.

This system provides the basis for the use of intelligent agents to deliver better healthcare to patients, especially in the case of home-based care for illnesses, the cost of which is increasing because of the ageing population in the world. The application of this framework can be applied to many e-Health service scenarios. This can range from doctor-to-patient monitoring from a remote location for chronic illnesses such as diabetes, to responding to emergency situations such as earthquakes and tsunamis, and tele-consultations.

As the telecommunication infrastructure improves in the future, we should see enhanced communication quality and faster transmission of data such that quality video and voice content can be captured by agents to allow healthcare professionals to

provide better patient services. More trials are needed to establish mobile e-Health that can help solve some burning global healthcare problems caused by the ageing population and the increase in chronic illnesses.

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