

WIRELESS NETWORK SUPPORT IN HEALTHCARE SECTOR

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Abstract: Providing adequate healthcare to poor, remotely situated, or dispersed populations is a huge social and political challenge today for every developing country. The information and communications technologies could add value to healthcare sector. The quality of patient care could be enhanced by enabling the safe and effective transmission of data over wireless networks in hospitals. Thus Wireless network deployment enables more rapid, efficient information exchange and management in hospitals. Wireless connectivity is the heart of each of these advancements, and appears to be a driving force in continuing the move toward better care. This paper is focused to discuss WiFi with QoS in healthcare sector.

1. INTRODUCTION

The chance of a patient receiving the wrong medication or the wrong dose was about 1 in 10 [1]. Because hundreds of patients are assessed in a typical emergency room each day, doctors and nurses require more efficient ways to manage information—and to minimize errors that compromise patient care. Research suggests that up to 61 percent of medication errors in hospitals are caused by illegible or inaccurately written prescriptions [2]. For healthcare environments, wireless networks helps satisfy the need for improved patient safety and the reduction in medical errors by delivering instant and secure communications. Foreigners are flying to India for medical treatment, the country is poised to capture the fast-growing market for off-shore healthcare and help solve the crisis of surging medical expenses in the developed world. Costs of advanced surgeries in India are as much as 10-15 times lower than anywhere in the world. It is no wonder then that the country is attempting to position itself as a much sought-after 'medical tourism destination', attracting foreigners with its low-cost, world-class medical treatment. In fact, medical tourism will account for 3-5 per cent of the healthcare delivery market in this period. The strategic investments in technology will also be required to create faster and smarter healthcare Facilities by deploying communication technologies that help hospital staff do their jobs more efficiently and also maintain a high level of quality. The technology applications that are available to hospitals today that play a crucial role in improving the quality of healthcare include cutting edge IP telephony, Wi-Fi [3] and RFID systems.

2. CHALLENGES IN HEALTH CARE SECTOR

- To reduce medication errors in the emergency room by enabling healthcare practitioners to

use wireless, handheld devices to access patient information at the time of assessment, enter the recommended medication, and produce a legible, printed prescription that can be dispensed by the community pharmacist.

- Nurses and doctors need ways to contact the proper staff member in the minimum amount of time.
- Improving patient care by relevant and up-to-date information for doctors and clinical staff is essential for effective healthcare delivery.
- Connected health care infrastructure.
- A health worker in remote locations to obtain expert advice or confirm their diagnoses in a timely manner is extremely difficult.

Healthcare facilities are at the forefront of deployment of technologies that help deliver better care to patients. Systems including mobile nursing stations, bedside patient record access and handheld devices have helped increase the quality of care that progressive facilities are able to provide. With active involvement of wireless technologies, the information for every patient will be available. The ability to contextualize that information quickly will be vital.

3. APPLICATION OF WIRELESS TECHNOLOGY

Mobile Telephony with caller ID: Hospitals can avail of small, mobile IP phones that feature display screens and caller ID, thus connecting nurses instantly with patients, and a configurable escalation system that can route calls to alternative staff.

Monitoring of health indicators: A patient monitoring system that is WiFi based allows for a highly customizable solution that combines information and alerts from several monitoring devices into a mobile IP

phone to improve overall workflow and efficiency and helping staff improve patient care and response times.

Expertise Diagnosis: A collaborative system with videoconferencing technology could interconnect teams of experts on demand, leading to better worldwide decisions and more effective care. First responders can help emergency room nurses assemble triage teams prior to arrival.

Training of Health Professionals: Clinicians can quickly contact offsite interpreters to improve communication between patients and care providers. Doctors across campus or across the country can review information instantly.

Knowledge Sharing/up Gradation: Wireless equipments, even on a small scale with limited resources, should be capable to increase the availability of information and provide staff with important tools, such as the Map of Medicine, that will help them to develop a good differential diagnosis.

4. WIRELESS LOCAL AREA NETWORK (WIFI)

Mission-critical aspect reflects the importance of application usage, which determines the strictness of the QoS requirements. Failing the mission may result in disastrous consequences. For example, the surgeon performs an operation through remote surgical equipment. Life and death of the patient may depend on the promptness and accuracy of the surgical equipment control. The accuracy of medical images (i.e., magnetic resonance image, x-ray image, ultrasound image) is extremely important. Distorted images may lead to wrong diagnosis.

WLAN technology is a term used for a wide range of Wireless Local Access Network technologies. Those technologies aim to provide connectivity and wireless access at a high bandwidth to IP-based networks in a similar way or better than wired connections (e.g. Ethernet) provide nowadays. All the 802.11 technologies are commonly known as Wi-Fi (Wireless Fidelity). Wi-Fi Alliance is an entity that certifies that vendor's products follows the different 802.11 specifications. It certifies 802.11, 802.11a, 802.11b and 802.11g. The 802.11g tries to combine the main advantages of 802.11a and 802.11b, so it is able to support a bandwidth up to 54Mbps using the 2.4 GHz frequency band.

WiFi Alliance has developed a subset of 802.11e called WiFi Multimedia (WMM) [4]. Four priority classes are recognized for voice, video, best effort, and background. This assures a consistent QoS mechanism across wired and wireless network. WiFi Multimedia (WMM) specifications provide prioritization categories by allocating different fixed and random waiting periods for various wireless applications.

WiFi wireless solution incorporates wireless switches and access ports, and is used to improve communications in and between different operating rooms. The solution will enable staff to locate patients in real-time, help optimize patient flow, reduce waiting times, and manage the patient care process more efficiently. In all hospitals surgical procedures are conducted every month, and therefore it is essential that co-ordination of these procedures does not hinder patient care. Hospitals are required to implement an innovative wireless and mobility solution to improve patient care. As well as managing the operating rooms, the new wireless solution enables real-time access to patient files in their rooms and enables hospital staff to order patients' meals in real-time. The WiFi network enables and manages operating room information that was previously distributed, manage medication administration and provide patients with Internet access. The WiFi gives us an overall view of all the medical treatment activities in real-time, allowing us to optimize information flows and reduce waiting times. Moreover, it allows us to ensure strict traceability with no additional work for operating room personnel. When patients go to private hospitals, they expect the best treatment and service. The use of new technologies can help deliver this.

In the longer term, the same infrastructure might also be used to provide rural communities in India with non health resources and information, such as instructions on how to build a water well, access to crop prices for farmers, and educational content for local schools.

Access to tools like the Map of Medicine can deliver tangible benefits to care providers and patients in developing countries. A patient suffering from fever, for example, was referred to Hospital from one of its health centers when staff used the Map of Medicine to confirm the diagnosis of a serious, meningitis-related condition. This early intervention contributed to saving the patient's life, demonstrating the importance of accessible and up-to-date information in improving treatment outcomes.

5. CONCLUSION AND FUTURE SCOPE:

With limited resources and modern technology like WiFi the health sector professionals could be sound enough to access the knowledge they need to diagnose and treat patients in the most effective way. A sound infrastructure with WiFi technology can enhance the relevant and up-to-date information, for effective healthcare delivery in terms of patient care as well health professional's skills. With information improved diagnosis and treatment at the point of care, we can plan to set up wireless broadband links between the hospital and the health centers in our country.

6. REFERENCE:

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NOT PRESENTED