

Emerging wireless technology in the healthcare industry case study example

[Technology](#), [Internet](#)



In the last few decades, technology has been advancing a rapid pace that has led to a staggering level of development across all fields of human activities. In the medical arena, a new technological development have been instrumental in facilitating rapid and more efficient diagnosis and treatment of various ailments (Vecchione, 2012). The emergence of the digital age is revolutionizing healthcare especially with the development of medical devices that are reliant on wireless technologies. The new medical technologies are expected to both allow a drastic improvement and a dramatic reduction in the healthcare coast.

The devices that use wireless technologies may be implanted, worn on the body for the purposes of measuring varied, numerous physiological parameters, and also to control various bodily functions. The devices may also be used to administer drugs and treatment in the proper dosage over time. The aforementioned bodily functions that can be regulated by the devices especially implanted devices include heart rhythms, offer electrical stimulation of nerves, monitor cranial and bladder pressure, function as glaucoma sensors and monitor hypertension. Eternal devices, on the other hand, be used to monitor vital signs and even assist in the movement of artificial limbs (Bajwa, 2014). It is expected that in the future that transponders can be embedded in pills to allow doctors to track and observe drug use and absorption over time.

As mentioned earlier, the wireless technologies are dependent on digital communications; the wireless devices operate by communicating with receivers that are located nearby. Various networks connect the receivers to the internet. The networks include; cellular systems, landline networks or

even broadband facilities. The beauty of the wireless devices is apparent in the fact that they eliminate the need for the patient to be tied down by a mess of cables (Bajwa, 2014). The wireless monitoring facilitates the movement of the patients away from the hospitals, allow the doctors to have real-time monitoring of their patients without the unnecessary visitations. The wireless devices also reduce the risk of infection and provide a comfortable environment of the patients while reducing costs. The wireless monitoring is a great addition to the doctor's methods in preventative and early warning systems.

With the emergence of portable but very powerful devices such as smartphones, tablet PCs and touch-enabled devices in general the medical, scientific community has been involved in incorporating them into the medical arena too. Smartphones such as iPhones and blackberries can only be regarded as microcomputers (Implementing A Wireless Network, 2005). The smart phones have numerous features that would facilitate the monitoring and transfer of information about the patients to the doctors. The features include cameras, emailing and instant-messaging, internet access Wi-Fi and even the Geographical Positioning Systems (GPS).

The healthcare has been increasingly expensive with the burden resting heavily on the patients themselves. The situation has become so terrible that some people avoid going to a hospital despite their ailments for the simple reason that they cannot afford the medical bills. As such, it is critical that the healthcare business have added value at a without punishing the patients for being sick. Hospitals move to a more wireless oriented approach has been noted be accompanied by overall cost efficiencies form just maintaining the

patients to creating an increasingly secure environment (Bajwa, 2014).

There are various components that are need in the wireless arena for there to be added business value in healthcare. The components can be categorized into short range wireless devices and the long range wireless devices. The short wave devices are mostly used for the patient diagnostics, monitoring and control. The devices include inductive implants that are implantable devices that are mainly used to control and monitor cardio activity and can communicate at a distance of less than a foot away from the patient. There is also the Wi-Fi, Bluetooth and Zigbee that are mainly used with the aforementioned cell phones, personal computers and handheld devices. The devices are mainly worn on the body but can also be implanted in the body (Implementing A Wireless Network, 2005). There have also been the recently FCC allocated spectrum of implanted micro-stimulator devices that could allow development of artificial limbs and restoration of mobility to paralyzed limbs.

In the long range wireless categories there are two main branches of technologies used in wireless medical field. The first would be Wireless Medical Telemetry (WMTS) that use an unlicensed spectrum to communicate information from the body sensors to a remote monitoring facilities. Finally, there is the Worldwide Interoperability for Internet Access (WiMAX). WiMAX is fondly referred to as the " last mile broadband access." The technology uses varied transmission modes that allow full internet access, providing up to 70 Megabytes per second over several miles.

With the arrival of new technology, the demand arises on the specialists needed to run it or at the very least training to the medical practitioners who

are to use it. As such with the introduction of the wireless technology due training is essential especially in the field as delicate as the healthcare field. Most of the new wireless technologies as evidenced by their widespread adoption are relatively easy to adopt. Nevertheless, various technologies will have to be acquired, and the support staff and training will also be a must. However, the advantages of a hospital embracing the modern wireless technologies far outweigh the possible costs and inconveniences during the integration period (Wireless Medical Technologies: Navigating Government Regulation in The New Medical Age, 2013).

The new wireless technologies despite having all the advantages that have been pointed out previously have been termed as a regulatory and technical nightmare. There are numerous technical issues that come with new technologies, and wireless technologies would hardly be an exception. The main current and potential problem with the wireless technologies would be the slow adoption of the technologies by the hospitals. In United States over 30 percent of the hospitals lack Wi-Fi connections and networks (Wireless Medical Technologies: Navigating Government Regulation in The New Medical Age, 2013). There are varied reasons as to the reasons leading to the reluctance of the hospitals to accept the technologies. Some hospitals have cited the numerous data breaches that seem to plague networks that are connected to the internet.

For the regulatory issues, there are three Federal Agencies in the United States that are concerned with the regulation of the wireless devices. The Agencies are the Federal Communications Commission (FCC), Centers for Medicare and Medicaid Services (CMS) and the Food and Drug Administration

(FDA). Under the present system, every wireless technology must have the authorization of FDA and the certification of the FCC. The CMS also must determine whether the device provides necessary and reasonable care for reimbursement purposes that are essential for a medical device's commercial success. The three tied federal structure translates into the fact that the manufacturers and developers have numerous challenges navigating all the agencies (Wireless Medical Technologies: Navigating Government Regulation in The New Medical Age, 2013). The agencies all have their numerous and different technical policies and rules accompanied by often divergent objectives. These challenges slow down the development and launch of newer and more improved technologies.

In conclusion, the challenges that face the wireless technologies can be resolved. The measures to deal with the challenges will include strengthening the defenses of critical healthcare systems against cyber-attacks that can target the patient's or hospital staff's data. The regulatory process must also be streamlined and if possible placed under a singular regulatory body to minimize bureaucracy. In summary, despite the numerous challenges that might accompany the process of integrating the wireless technologies the advantages offered are worth the price.

References

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