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What are the Most Important Barriers to Implement Radio Frequency Identification Device (RFID) in Healthcare System?

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Introduction

There are many significant barriers to implement Radio Frequency Identification Device (RFID) in the healthcare system as follows:

• Wireless infrastructure/connectivity problem;

• Cost of RFID system;

• Lack of RFID standards;

• Lack of government support;

• Privacy and ethical issues;

• Resistance of staff and Change management issues;

• Security issues.

Radio Frequency Identification (RFID) is a technology which utilizes radio waves for collecting and transferring data, with the capability of sending and receiving information without human involvement [1]. It isn't a new technology; this technology has been around since 1950, when Harris invented a radio transmission system [2]. Adoption of radio frequency identification (RFID) technology in the healthcare industry is relative newer than others sectors such as education (especially in libraries), retail, manufacturing, logistics and supply chain. RFID adoption has been successfully applied in the supply chain manufacturing, retail and logistics and tremendous potential is applied more widely areas [3].

Building an RFID system in a hospital environment is quite difficult [4]. In addition to the difficulties of building software and hardware system in hospitals, RFID systems are utilized in safety critical settings where critical patient information is at stake, therefore; such conditions make it more difficult to be adjusted in health care setting. In this article, the main barriers to adoption of RFID system in healthcare settings are presented.

Wireless infrastructure and connectivity problem has been indicated in different case studies as a barrier to RFID system adoption [5-6]. The staff didn't convince that implementing such technology can lower their medical duties and producing a perfect process. Because of a special condition of hospitals, regarding physical infrastructure and the architecting of building, wireless communication wasn't available in operating rooms and dead zone [5].

In addition to these problems, some of the windows applications continually are trying to gain access and reconnect to different wireless networks, which make the system's reliability low .All these flaws in connectivity make the acceptance of this technology difficult.

According to Vilamovska et al. the cost is a barrier to RFID adoption because, the system requires lots of change in the healthcare environment including integrating antenna into walls, construction costs, running replacement services, electricity and continues accuracy checking of system in the rooms, lacking in clearness of benefits, cost of system failure and finally mistakes in calculating of return of investments [5].

Yao et al. also identify some other reasons which can rise up the cost of RFID adoption in healthcare which include adding additional servers, databases, middleware and applications, cost of tagging of each item, integration with back-end systems and finally data synchronization networks are also increasing the total cost of adopting of RFID [1].

Based on Vilamovska et al. study, some professionals pointed the existence of standards and mandating of regulation as an important issue in implementation of RFID system in healthcare [5].

According to Jones et al. The UK's Calcutt Committee defined privacy as "*the right of an individual to be protected against intrusion into his personal life or affairs, or those of his family, by direct physical means or by publication of information.*" However, these days when an issue of privacy comes up, it concerns data protection, which represents privacy in terms of the management of personal information [7].

A study by Azevedo et al. confirmed that the level of security which has been offered by RFID technology makes it another challenge for organizations to adopt the technology [8]. It is not difficult to gain access to the information which is transmitting by RFID system; it only requires radio telescope from close range to capture a data, therefore many organizations fear to support the RFID system adoption.

According to Vilamovska et al. human psychology of personnel reaction, acceptance of new technology and their resistance should be addressed prior to RFID implementation in hospitals, so that modification of work process can be absorbed into the subconscious of personnel [5].

Shih et al. believed that, government policy/legislation is a barrier for RFID adoption [9]. Government mandates can increase the widespread RFID adoption [10].

Conclusion

As a conclusion, literatures confirmed some major barriers such as wireless infrastructure/connectivity problem, the cost of RFID system, lack of RFID standards, lack of government support, privacy and ethical issues, resistance of staff and change management issues in which are the important factors to implement RFID in health care systems. We must solve these problems in order to apply this system.

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