Application of Radio frequency identification technique in Developing Countries

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Abstract: Radio frequency identification (RFID) technique is a practice for managing the supply chain of healthcare. Technique of Radio Frequency Identification (RFID) not just offers following ability of different resources continuously, yet in addition gives productive and exact access to healthcare information for specialists and other experts of healthcare sector. The primary challenge faced by RFID is its acceptance and utilization by doctors and medical attendants only. This paper utilizes semi-organized questionnaires on RFID advisors, scientists, and medical hospitals directors/doctors. Information was gathered from 150 doctors and attendants/nurses. The development of RFID adoption in the developing countries is still in the initial phase. The significant barriers, advantages, application and critical success factors of RFID have been recognized in this paper. This study adds to the developing interest for understanding the RFID adoption in the healthcare services industry. The motivation behind this research is to understand the current opportunities, potential advantages of RFID adoption in Indian healthcare industry.

Keywords: SCM, RFID, Healthcare Sector.

1. INTRODUCTION:

Healthcare sector in developing countries are suffered by many well known challenges. RFID Innovation is an approach that can be used to overcome these challenges. The objective of this research paper is to explore the knowhow of this technique, in order to improve the healthcare services. With upgrades, patients will get better cure of their health because the errors in treatment of patients will be reduced. Many existing studies likewise recommend that appropriate administration of RFID innovation usage may upgrade healthcare administrations and items by reducing the costs. RFIDs, or radio recurrence ID tags, are installed inside or close to an item or shipment [1]. They fill in as an apparatus of remotely following supplies, gear, and individuals as they travel through the supply chain from producers to providers, wholesalers, drug stores, middle people, and end clients just as their development inside a solitary industry [2].
Tags used in RFID are primarily of two kinds, namely active tags and passive tags. The function of active tags is to continuously transmitting the signal so that the traced item can be situated in the distribution centre. Active tags can be used for the most part be distinguished and classified as any tags that can transmit a sign more remote than 3 meters [3]. These tags very in cost significantly relying upon the necessities of utilization. Inactive tags don't transmit the signals, yet react to a RFID scanner when the item or shipment is set through the filtering entry. These generally react just to signals sent from under three meters away [4]. These tags are inexpensive and continuously its cost is reduced continuously. RFID has been widely acceptable in the healthcare supply chain of many developed countries [5]. The cost involved is the primary barrier of its adoption in developed countries like India.

2. THE NEEDS OF RFID IN HEALTHCARE

Healthcare sector in developing countries are facing the numerous challenges like improvement in the security of patients and reduction in operational cost [6]. Therefore the high productive operational productivity and patient security is the major concerned [7]. There are many issues that arises the need of adopting the new trends of healthcare. Following are the major issues which desperately show the requirement of RFID adoption in Indian healthcare system:

2.1 MEDICAL MISTAKES:

Mistakes during the treatment of patients are still the first and foremost issue that shows the need of RFID adoption in Indian healthcare sector. Everyday patient died in the hospital due to the errors occur in their treatments. Because of this patient required the new innovative technique such as RFID which reduces the possibility of medical mistakes and ensure the security of the patients [8].

2.2 INCREASED EXPENSES:

Cost of patient service in Indian hospital are still out of pocket of the ordinary person. High quality of patient care and services requires the fund and its arrangement is a big issue of common people [9]. Using latest technology like RFID will further increase the cost of total medical expenses but it also increases the chances of improvement in patient services [10].

2.3 THEFT MISFORTUNE:

It is assessed that the burglary of equipment and supplies costs hospitals/hospitals $4,000 per bed every year, which speaks to a potential loss of $3.9 billion every year with more than 975,000 staffed beds in the U.S. [11]. Therefore, following therapeutic gadgets, particularly costly resources, is of highest significance. Additionally, some recyclable therapeutic instruments are unnoticed and disposed of by the cleaners without restorative information [12].

2.4 INEFFICIENT WORK PROCESS:

Inefficient work processes exist in each hospital in view of the trouble in apportioning assets continuously [13]. For example, specialists and medical attendants burned through more than 30 percent of their working time scanning for or perusing data about patients [14].

3. ADVANTAGES OF RFID TECHNOLOGY:

Advantages of RFID adoption in healthcare industries are numerous if it is applied in right way. Benefits of RFID adoption were already discusses by various researchers in past. Overall reduction in cost and patient treatment time, a great improvement in the safety of patients and overall increase in patient services are the three potential advantages of RFID implementation has been discusses by when it is considered in hospitals of Taiwan. Some authors agreed that it is useful to improve the business
process when adopted in medical hospitals [15]. It will also improve the profitability of the organization. One more advantage of providing tags on the drugs is that it is safe against counterfeits. A few organizations that produce healthcare services effectively use tags for criminal avoidance [16]. Some pharmaceutical organizations inserted RFID tags on every little bundle of medications [17]. Safety of patient is the primary concern of every healthcare organization and it is also true that numerous patients' demises are happened restorative blunders as human blunder and frameworks mistake in medical hospitals. RFID is the way to lessen therapeutic mistake [18]. Information section, understanding status show, incorporation and standard activity strategy consistence procedure could be disposed of to accomplish proficient and adequacy process business utilizing RFID innovation [19]. Therapeutic staffs as specialists and attendants can rapidly find patient and healthcare hardware when they analyzed patient and utilized gear however RFID adoption [20]. Following are the major advantages when it is applied in hospitals:

### 3.1 IMPROVED PATIENT SAFETY OR DECREASED HEALTHCARE MISTAKE:

The application of RFID in hospital ensures the patient security. It is also the primary and foremost objective of every healthcare is to secure its patient. Security of the patient in hospital is ensuring by continuously watching the area of the patient surrounding. It also provides the details of data / information related to patient and gathering the medicines information which is taken by the patients [21]. By implementing the RFID provides the better coordination among the staff of the hospital and improve the information system of the hospital. Therefore it can be concluded that by the implementation of the RFID in the hospital offers the better control of accessing the patient related information and it further improve the safety and security of the patient in the hospital [22].

### 3.2 REDUCTION IN TIME AND COST SPARING:

By the application of latest technology in healthcare sector like RFID will reduce the patient treatment time and ensures the better medical facility to the patient. It also reduces the excess workload from the staff of the hospital so their operational efficiency improves drastically [23]. Again by adopting the advanced methodology provide the cost sparing in the hospital.

### 3.3 IMPROVED HEALTHCARE PROCEDURE:

RFID implementation reduces the operational and work process formalities with the patient in great extent as the manual process is replaced by the programmed functions in the hospitals. In addition, the recorded information can be broke down to improve medical hospitals productivity [24].

### 3.4 OTHERS BENEFITS:

Innovation of RFID in hospital provides some other valuable advantages like improving the relation between the suppliers of medicines and surgical equipments [25].

### 4. BARRIERS TO RFID ADOPTION:

Very less study in the past shows the barriers of RFID implementation in hospitals. Information sharing is major inhibitors of RFID implementation in Indian hospitals. A few respondents are skeptical to actualize this innovation in light of the fact that even their IT isn't ideally executed [29]. The vast majority of medical hospitals have effectively executed IT. They accepted that the vast majority of staff in their organization staff and therapeutic have capacities to work IT. Cost of RFID tags are decreasing continuously therefore it is better to adopt the latest innovation of RFID in hospitals. In business barriers
setting, a large portion of respondents considered primary obstructions components of RFID adoption are absence of data, no financial limit or store accessible. Following are the major barriers of RFID implementation in Indian hospitals:

4.1 TECHNICAL ISSUES:

First and foremost barrier of RFID adoption in Indian hospitals is the technological up gradation. Very less hospital especially in rural areas have technological upgraded gadgets that can work on the RFID framework [30]. Another problem of RFID innovation in Indian healthcare sector is the reliability issue of information obtained from RFID framework. RFID read precision relies upon a number of elements, for example, tagged item, tags situation, and read separation. Again the lack of Infrastructure and lack of standard gauges crates the enormous problems of adoption of this technology.

4.2 COST:

Initial investment of RFID innovation in Indian healthcare sector is also a big concern. The justification of this investment is only possible if all the patients and medicines were fully tagged. Cost of the RFID framework, proper infrastructure and Information sharing is very difficult to justify in Indian scenario [31].

4.3 PRIVACY CONCERNS:

RFID utilizes the various personal information of the patient and if this information is leaked and misused then may create a lot trouble to patient. The fear information misused is also a factor that hurdle the implementation of RFID in Indian healthcare sector.

5. FINDINGS AND DISCUSSIONS:

RFID have been applied in various fields like technical designing, electric building medical and in emergency hospitals etc. In the patient medication it can easily diminish restorative mistakes related with the drug taking procedure. In healthcare industry RFID lessen healthcare mistakes and improve understanding safety. RFID empowers universal gathering of hospitals information, gives key administrations to persistent focused chronic, and uses these healthcare information for agreeable consideration. Furthermore, it can completely utilize understanding information for research and healthcare services announcing. A few studies imagine the eventual fate of a RFID-empowered shrewd hospitals that utilizations RFID and remote innovation to give an different of uses [32]. The first and foremost advantage by using this technique is that the safety of the patient improved and chances of medical blunders has been reduced up to a great extent.

Nonetheless every technique which is beneficial to mankind always has some hindrances. Similarly restrictive costs, technical impediments, and safety of the patients are the primary concern to adopt RFID. Therefore it is essential to provide sufficient knowledge to healthcare professional toward effective usage of RFID frameworks. RFID execution in medical hospitals ought to be tried to preclude technical inadequacies. A few studies have demonstrated unsafe obstruction between RFID sign and restorative hardware. Moreover, RFID isn't constantly solid and 100% precise. Another issue is that patients, all the medical staff in the hospital should be clearly and precisely instructed about the usage of this advance technology. This will ensure the safe and fruitful results and also able to diminishes medical blunders [33]. In order to reduce the initial set up cost of the framework of RFID in Indian hospitals, it is required that technology should be blended properly with the remote system of the hospitals. These frameworks should be structured with the capacity of changing and evacuating administrations.

To summarize, the RFID in healthcare improve persistent safety, free time, and lessen overall medical costs but it requires the motivation and support from the healthcare executives and all members
of healthcare chain.

6. CONCLUSIONS:

To improving agility through RFID usage process are in the inception stage. In the RFID initiation stages, the officials and chiefs will attempt genuine active or passive endeavors to look for data arrangement that can be utilized to tackle hospitals issue, expanding upper hand or acknowledge medical hospitals technique utilizing RFID innovation. The study finds that most of respondents determine advantages of RFID adoption that were increasingly arranged on impalpable, as opposed to unmistakable advantage, for example, lessening cost and time and improving efficiency. Hospitals confronted more prominent hindrances in RFID appropriation than their partner inhibitors especially absence of data, deficient spending plan accessible and absence of ROI business. The study discoveries call attention to that the principle elements of barriers against of RFID appropriation are the absence of data and the lacking spending plan. For innovation hindrances, the intricacy of innovation and frameworks is essentialness components.

Hospitals that will effectively actualize RFID innovation think about that blend of variables in vital, the executives and operational levels. Top administration backing and duty initiatives at vital level, beginning with little RFID venture in the board level and coordinating the information gathered is the fundamental basic achievement factors. These components recommend that healthcare sector are probably going to prevail in adoption of RFID additionally focus others areas, for example, building up a reasonable RFID technique, planning and advanced effective methodology. The price involved in adoptions of RFID like the tags and frameworks have kept on diminishing later on. The RFID avocation process structures ought to consider multifaceted nature of RFID basic leadership, for example, numerous criteria, between connections among RFID criteria and RFID achievement task ought to consider RFID basic achievement factors.

7. LIMITATIONS & FUTURE SCOPE:

The very first limitation of this study is that it uses very less data because of the limited literature is available in this field of research. The study was restricted healthcare proficient information dependent on industry reports and articles as it were. An inside and out guide study could give more confirmation of the result obtained. In future, this study explores the role of innovation and the ability of real administration in healthcare supply chain management.

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