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AN OVERVIEW ON RECENT DEVELOPMENT OF RFID TECHNOLOGY IN INDIA

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Abstract In this paper, an attempt has been made to throw the lights on the remarkable presence of the Radio frequency identification (RFID) technology and its application and benefits in today's perspective. RFID is really efficient and detects easily quantity, variety and proper information which reduces queues, decrease repeatable tasks, extend internal security, procure collection, lower the cost and raise efficiency of inventory management and arrangement. The practically cost effective implication use of this technology is in transportation/distribution, industrial, security and access control, nuclear plant system, airport security, animal identification, automated library system, healthcare, digital card mail, toy industry, economic sectors such as retail sector, commercial sector, healthcare services, checkpoint system and toll road control. A better management system is related to broad understanding of the technologies implemented in various sectors and sufficient literature review o the RFID technology is provided including supply chain system and its appropriateness are discussed. The study provides concerning point of future research, facilities and knowledge concerning role of the RFID technology adoption.

Keywords RFID, AIDC, SCM

Introduction

RFID is a rapidly evolving Technology for automatic identification data capture of products. RFID is in today's perspective changing the way of companies in supply chain system which track, trace and manage assets easily. This will have major impact upon the whole supply chain. Radio Frequency Identification (RFID) is a term used to explicate technologies that use radio waves for "identifying and tracking objects automatically". This RFID system can store information of goods or a product and communicates and integrates this information by sending/ receiving radio signals to a software system. These technologies transmit the signals below the detectable light with frequencies called "bands" by intonation of electromagnetic waves. Unlike Internet and wireless technologies, RFIDs started off with humble beginnings and have taken much longer periods for implementing them commercially.Radio-frequency identification (RFID) can provide cost effective solutions to improve organizational efficiency. In the context of supply chain management (SCM), the technology has been considered as 'the next revolution' since it allows the tracking of each object or product in real time in the supply chain (SC). However, while RFID seems to offer a unique potential to SCM improvements over existing automatic identification and data capture (AIDC) technologies.

This technology is explained below as figure out as an electromagnetic or electrostatic coupling in the RF (radio frequency) portion of the electromagnetic spectrum is used to transmit signals. The RFID system consists of an antenna and a transceiver, which read the radio frequency and transfers the information to a processing device

(reader) and a transponder, or RF tag, which contains the RF circuitry and information to be transmitted. This technology by 2005 has grown to a $3 billion industry and is projected to generate $25 billion industry by 2015.

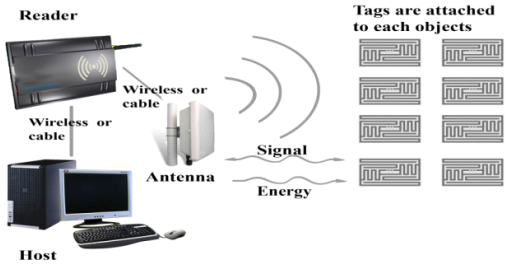

Figure 1: The RFID Process

The key components of the RFID system are its tags and readers. Tags carry the information and the reader obtains this information and transmits this to a middleware system. These tags are also referred to as transponders and are available in two categories called as "active tags and passive tags".oztaysi in 2009 differentiate these tags as "read and write, read only and write once and read many". These active tags contain its own power source to receive and transmit information while passive tags contain no power and only used to transmit information. The reader RFID system is used to receive data from the transponder *i.e.* active or passive tags. Due to RFID technology there are many factors affected in supply chain management such as inventory accuracy, accurate information due to it reduces bullwhip effect and safety of products for long duration or definite period. This technology has many advantages in the supply chain system.

RFID in India

Now beginning of this technology is beginning in India there are many industries of different sectors are wanted to adopt this particular technology and takes benefits from this. There are many implemented at present and many are implemented in future whether they are government organization or private sectors or retail outlets all are wants to adopt this technology which is cost effective in long term and beneficial for them are to adopted. There are few list are given table 1:

Table 1: List of government organization or private sectors

Sectors	**Company Name**	**Benefits**
Manufacturing	Vedanta ,Ashok Leyland	Processed
Pharmaceuticals	Ranbaxy	Implemented
Airlines	Sanghai air India	Processed
Toll road	Central government	Processed
Retails	Pantaloon Madura garments s,	Processed
Government	Indian railway, Rajasthan government	Future implementation
Banks	Yes bank	Processed
Energy sector	IEED	Future implementation

Table 2: List of Industry/organization

Industry/ organization	Item tagged	Type of tag	Read/write	Year/stage	Result
Semi-Conductor: Phillips	Boxes of microprocessors at manufacturing and packaging from Taiwan to Hong Kong.	Passive 13.56 MHz	Read/Write	2003-2004 trial, 2005 rollout	Trial: Automatic inventory updates, trial showed use of labor needed reduced by 25%, reduced inventory receipt time to take shipments into inventory and process outbound shipments by 50 percent each.
Defense: Raytheon	Warehouse parts with value greater than $1,000	Passive	Read only	2004-2005 / Phase 1 pilot	Automatically perform cycle counts, increase inventory visibility, improve inventory control
Pharmaceutical: Purdue Pharma	Track and authenticate bottles of OxyContin from factory to Pharmacy.	Passive 915 MHz	Read only	2004-2005 pilot and rollout	RFID-tagged and shipped more than 200,000 bottles of OxyContin Nov 2004-March 2005.
Recreational Vehicles: Harley Davidson	Bins carrying parts of custom motorcycles during assembly	Passive 13.56 MHz	Read/Write	1998/ rollout	Automatically displayed manufacturing instructions for employees at each stage of the assembly process
Auto Manufacturer: Toyota Phase	Carriers containing car frames as they move through paint stations during production	Passive 13.56 MHz	Read/Write	2001/ rollout	Streamlined manufacturing and vehicle tracking; saves on interest charges
Beverage TrenStar	Beer kegs as they move through the supply chain	Passive 125-128 MHz	Read/Write	2001/ rollout	Improved demand forecasts and increase efficiency; identification of black-market sales and elimination of misdirected shipments
Paper and Paper Products: International Paper	Cores of larger paper rolls moving through the warehouse	Passive 915 MHz	Read Only	2003/ running	Reduction of lost and misdirected paper rolls
Apparel Stores: Gap	Denim apparel through the supply chain and onto store shelves	Passive 13.56 MHz	Read/Write	2001/ pilot	Improved customer service through better inventory management on shop floor; increase supply chain efficiency and data accuracy

Conclusion

No matter which technology best helps in determining the "right" choice, it is clear that RFID technology comes with social implications. As technology keeps advancing, society keeps a watchful eye. In order to maintain an

ethical balance between convenience, efficiency and privacy, consumers must question new technologies and understand their potential impact before allowing technological advancements to be adopted and implemented in everyday life. RFID chips should not be treated any differently. Instead of sidestepping the issue of privacy, we need to give it great consideration for the betterment of society. In the grand scheme of things, these benefits may not outweigh the obtrusiveness of privacy that accompanies them. This paper presents a practical authentication, integrity and cloned avoidance approach for such application.

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