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The Implementation of Rid Technology in Retail Industry in India

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Abstract: *Radio Frequency Identification (RFID) is the use of radio waves to read and capture information stored on tag attached to an object (EPC-RFIDINF. 2017). RFID is a technology which is finding its use in almost every field today. This study tries to find its application in the retail sector. The study aims to find the level of awareness of RFIDamongst mangers in retail industry, find whether RFID has been implemented by retailers in India, the benefits that RFID provides and the challenges the technology brings with it. Therefore the objectives of the study are:*

- *To find the level of awareness of RFID.*
- *To provide a background of RFID as a technology.*
- *To find the benefits of usingRFID.*
- *To find the challenges of using RFID.*

The study would also try toassess the future of RFID in India in retail sector.
The study is based on primary data collected by administering a questionnaire on managers in the retail sector. All kinds of retail industry was included irrespective of the nature of products they dealt in. The study concludes that there are multiple benefits of using RFID but there are also challenges of its use. It further concludes that RFID as a technology has a future in retail, is being accepted by retailer and it has come to stay.

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I. Introduction

Radio Frequency Identification (RFID) is one of the identification technologies in which tags and readers such as the popular combination of barcode/reader. The two differ mainly in that while a sensor and light are used in barcodes technology, radio waves are used in Radio Frequency Identification. With radio waves several products can be read at once whereas barcodes could only be read individually. Though the main use of this identification technology is in supply chains, it can be utilized in a number of other fields since a tag can contain data. It can be used in marketing and logistics, for instance. This study explores RFID technology aspects of supply chain and warehouse management.

(Panian et al., 2007, p. 17-18) argues that with the advance growing of market competition nowadays, companies should make stronger their capacity to compete. Many factors affect this capacity like information and communication technology and information systems. They thus produce novel business intelligence, known as competitive intelligence.

However, the cost of a RFID system implementation has been a real problem for many. Moreover, man does not easily accept major changes in the how things are traditionally conducted. Recently, the argument has been going that RFID yields its rewards immediately *Kärkkäinen 2003*, asserts that investments of RFID yealds fast capital amortization as it offers a number of operational advantages. However, it would yield such benefits only if he technology is implemented with the use of recyclable containers. We can recognize the benefits of such technology form the decrease in the cost in all the supply chain, the betterment in inventory accuracy and the improvement in the customers' satisfaction in sale points. This, in (Swedberg, C. 2012)'s view, will make possible the tracking of products in the store. Hence, it will help in understanding the interests of the costumers. It shows, for example, if products are taken to the trying room, to check out or put back on the shelves.

1.1 History of RFID-technology

According to (Tielinen, 2011), the origin of RFID goes back to the Second World War with the invention of the radar. The radar helped in seeing the movements of aeroplanes, but without knowing their intentions. Hence, a new technology was introduced in which allied planes were provided with aerials and transmitters so that they reply back to the radar's signals. It was named "IFF", initials of Identify Friend or Foe.

(Tielinen, 2011) further argues that the 1980´s witnessed the second appearance of RFID. The technology was then used to track and identify farm animals that needed special medical care. The technology was also used in car manufacturing as tags were built in keys so that a car would identify the correct key.

II. Technological Innovation in Retail Industry

Now a days, the retail industry is facing a danger challenge because of rapidly changing market conditions, fuelled by growing global competition, higher expectations of performance by ever evolving technologies, customers and the market (Lin et al., 2002). in the past three decades, the industry has been growing significantly because of technological innovations, and by adopting supply-chain management techniques, such as quick response systems (QRS), which combines technologies, modular layouts, process reengineering, total quality management, and employee involvement (Fiorito, et. al., 1998; Kincade, 1995; Ko&Kincade, 1997).While QRS has a successful initiative for the retail, there is an increasing need for a new technology to revive and sustain its vitality in order to deal with the customer demand and growing market pressure. The retail industry welcomes RFID as a possible solution to this barriers, although it is not clear how to harness it to maximize its benefits while controlling its risks and what the limits of the technology.

III. Merits and Demerits of Rid In Retail

The major advantage of the implementation of RFID technology in the supply chain is the collection of data from various objects that, once information is delivered in digital format, is generated to all users. Also, RFID technology has been significantly positive in locating individual objects inside in another location in the supply chain or warehouse or a plant. But it also leads to collection (compilation) of highest amounts of data in operating the system of enterprise. Further, reading a lot of tags at the same time often leads to ultimately loss of data and a collision. Many a time thus, anti-collision algorithms are applied, while research into new methods of prevention of these phenomena continues to develop (Kaur et al., 2011, p. 154).

Use of RFID tags entail a comany numerous benefits. For instance RFID tag IDs denotes the presence of individual products; this indicates As well as gradual reduction of warehouse space in stores and enables an organisation to move to Jet (just in time) business. In this way retailers could boost sales space (Dujak et al., 2011, p. 267). RFID carry data on the time of purchase and location of purchase and therefore help in refund and return of products.

Thus the execution of RFID technology in the retail SCM represents the need to survive in the global market and competitive advantage.

Effect of different materials on RFID communication

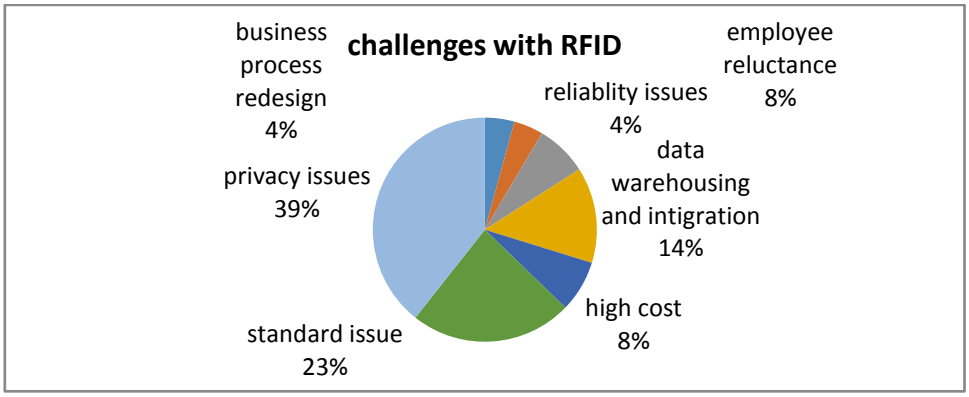
Composition of materials	**Effects on RF signals**
Plastic	frequency oscillation (dielectric effect)
Metal	Reflection
human/animal body	absorption/frequency oscillation/reflection
Cans	the effect of multiple transmission/reflection
Glass	attenuation/damping

Source: Sweeney, J.P. (2010). RFID for Dummies. USA: John Wiley & Sons. p. 164

IV. Concerns regarding Rid

In any case of the major advantage of piloting a system based on radio frequency identification-technology there are many solicitude upon the technology. The main concerns are lack of standards privacy, cost and fear that largest retailers would had a raised position of power because of the technology.

The coming figure presents by Bhattacharya, Chu and Mullen (2007) presented that the main barriers as regard Radio Frequency Identification systems in a optical manner. As to the research Privacy matters are the prime concern, followed by cost and standardization.



The challenges with RFID (Bhattacharya, Chu and Mullen (2007)

V. Literature review

The benefits of determining radio frequency in retail can increase operational efficiency (Bhacharya, Choo and Mullen, 2007). RFID allows tracking of many brands throughout the supply chain, while simultaneously reading the accuracy of the inventory and the cases of inventory can be seen very clearly.

This refined vision across the supply chain (SC) is the major advantage for the retailer; orders and items can be tracked in certain time. Further benefits could also be seen at customer end. The shopping behaviour could be analysed by tracking items in-store. Other major benefits of this system are decrease labour costs, improved information about packing and shipping and security against theft. (Bhattacharya, Chu and Mullen, 2007). Further since item level labels can be marked, one can further survey a fixed consumer group and thus create consumer profiles on the data gathered. On a long-run scale this can enable retailers to tool up for an individual shopping experience for all the customer. (Roussos, London Uni.).

Al-Mart (together with Procter & Gamble) had found route of item-level and smart shelves Radio frequency identification for cosmetics (Wolfe et al. 2003). Wal-Mart had also wanted its top 100 suppliers to piloting Radio frequency identification on the pallet-level and case by 2005 (Romanow and Lundstrom 2003). Gillette and Tesco had cooperated on item-level Radio frequency identification in Britain. Tesco used a smart shelf system and Gillette stages razor blade cartridges to monitor stock in retail stores.

By comparing the usage of Radio frequency identification In 21 different companies in different industries, Ferrer (2009) is fond of that there are four basic advantage of technology for the majority: shorter cycle times, reduce the amount of work through automation, and benefit from self-service and loss prevention. Three factors are believed to affect when companies decide to implement RFID; the first is transparency in the supply chain, suppliers or competitors, the second is thebenefits expected from the Radio frequency identification into use, cost savings through less need less theft for equipment expenses, labour and is demand from customers (Roh (2009)

The last factor is that new products and new business processes are created. In the study on Montotti (2006), he explained how the production of the label improved the definition of radio frequency moving forward time, seemed more durable, smaller, and lower in cost and increased data capacity. When the author believes that the cost factor is determining which companies are looking for investment, it is a matter of time for RF technology to be found everywhere.

A study has revealed how Automatic identification and Radio frequency identification developed the efficiency in outbreak the supply chain, Buy organization and greatly raise the rank of customer service Alexander (2002).

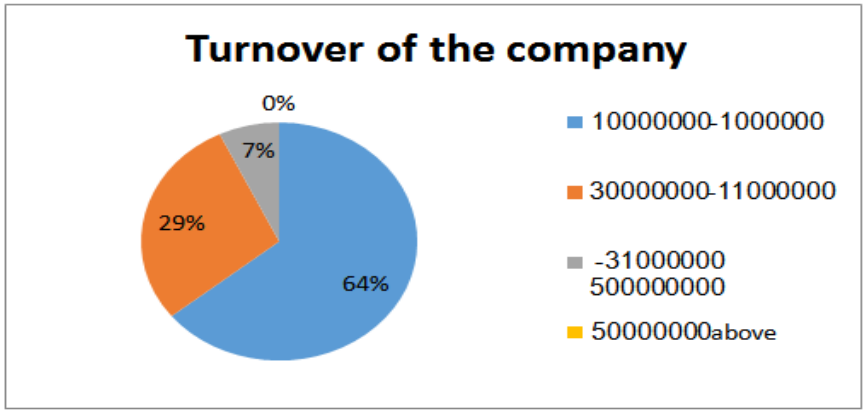
VI. Research methodology

The study is exploratory in nature. The objectives of the study were to

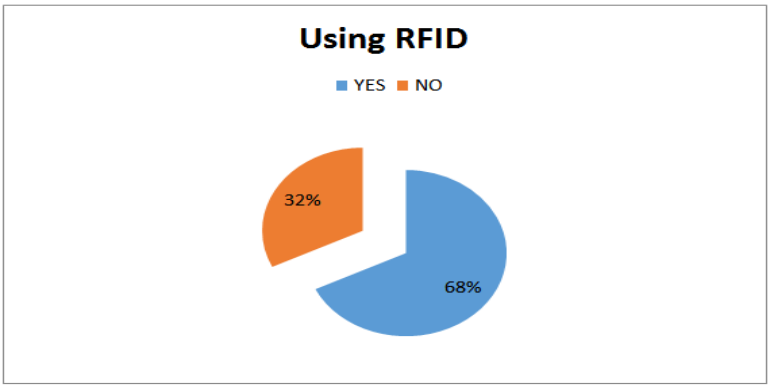
1) Provide an overview of RFID as a technology.
2) Benefit of implanting RFID.
3) Challenges of implanting FRID.

The study is based on primary data collected in Aligarh and Delhi. Therefore the scope of the study is limited to these regions. The respondent were retailers.

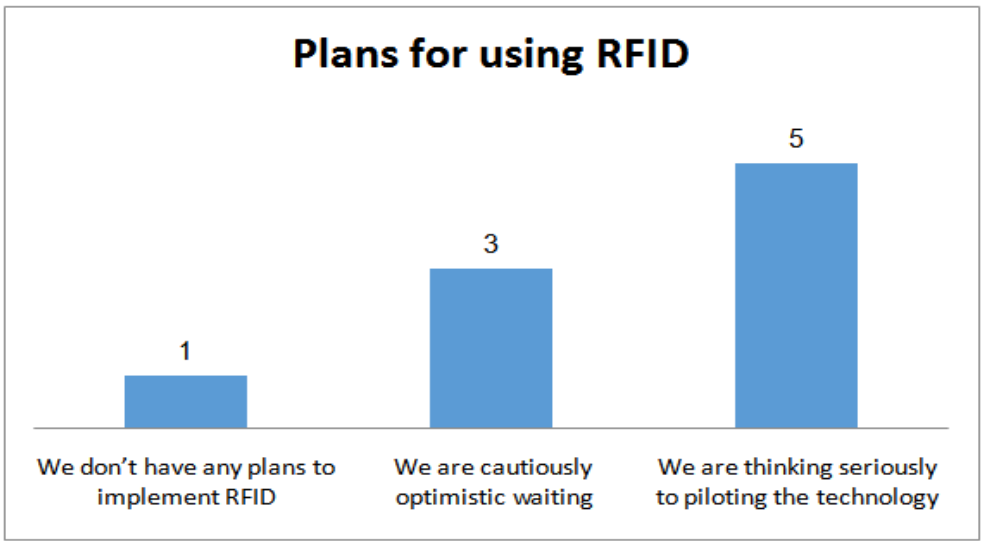
VII. Analysis



Majority of the companies have turnover between 1 million and 10 million.
Some factories have turnover between 11 million and 30 million and very few have turnover between 31 million and 50 million.

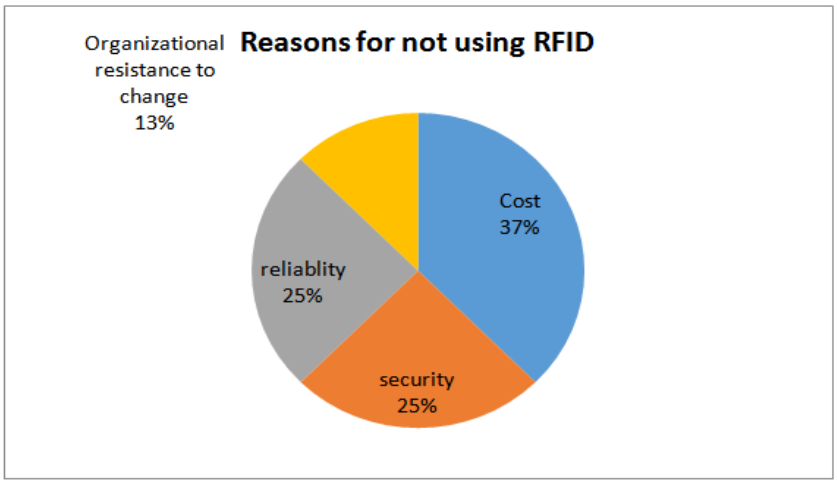


Majority of the companies are using RFID. Only 32% factories are not using RFID.

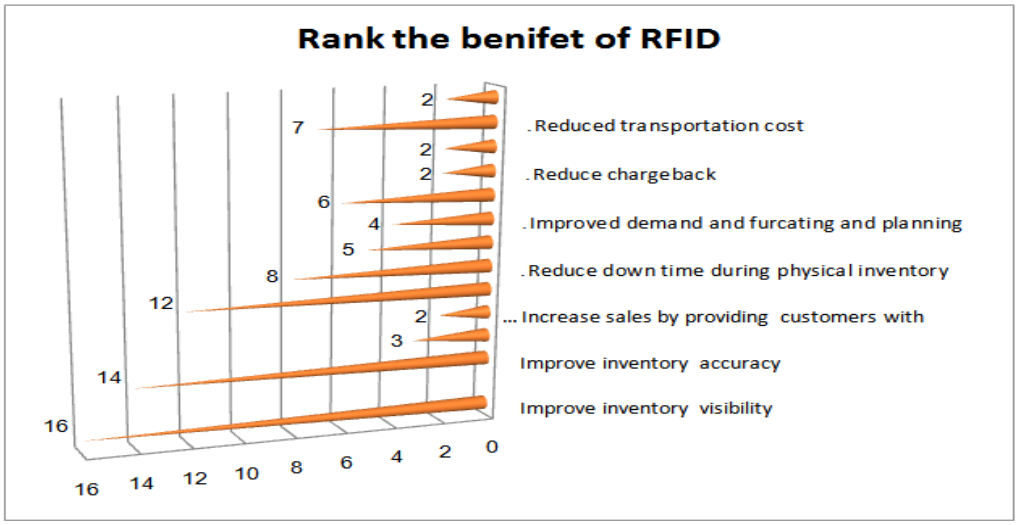


The purpose of this question was to collect data about the attitude and beliefs of RFID as a feasible technology. Thinking seriously to piloting RFID in the future was the answer of the vast majority.

It seems that companies are planning to introduce the technology examining its benefits. One company answered that it have no plan to introduce RFID.

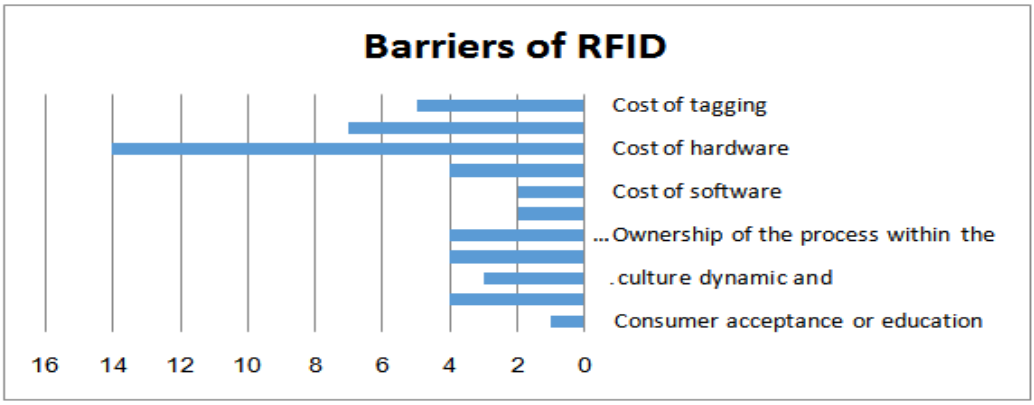


The main reasons of not implementing RFID in the companies was cost in 37%. Reliability and security have same percentage in 25%.



Inventory visibility, accuracy and customer insight are the top ranked benefits of RFID. Time during physical inventory, reduced transportation cost, reduced distribution cost are ranked lower. Store labour associated with cycle, improved demand furcating and planning, number of perpetual, anti-counterfeit, shrink, chargeback, and providing customers with information are ranked lowest.

Rank the benefits in order of importance Inventory visibility, accuracy and customer insight Time during physical inventory, reduced transportation cost.



Cost of hardware, Trading Partner Buy –in and Cost of Tagging are among the largest barriers of RFID.

VIII. Conclusion

There are advantages from implementing RFID as well as challenges. These were the major advantages found improve inventory visibility and accuracy, customer insight and reduce customer transportation. Cost of hardware, Trading Partner Buy –in and Cost of Tagging are among the largest barriers of RFID. These disadvantages yet implementation substantial edge over competitors.

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