Global Scientific JOURNALS

GSJ: Volume 10, Issue 4, April 2022, Online: ISSN 2320-9186

www.globalscientificjournal.com

Detail for Radio Frequency Identification (RFID) in an Organization

Satyam Parikh

ABSTRACT

Radio frequency identification benefits if incorporated in numerous ways, the privilege of achieving greater results is possible under this latest technology. The radio frequency identification being used allows the Sterling Services to better manage the business at lower the cost. To facilitate the customers and stores need they have implemented radio frequency identification for all four convenience stores. The barcode is not as transparent as radio frequency identification as each individual product having a barcode needs to be scanned individually. In many cases where radio frequency identification has been positioned within the product has been strongly opposed as it evades privacy and it can cause cancer. Radio frequency identification makes it simpler for Sterling Services to know what stock should be replaced with the expired stock rather than having problems at later stage.

Table of Contents

Define the term RFID

'Radio frequency Identification is an automatic identification method relying on storing and remotely retrieving data using devices called RFID tags or transponders.' (Wikimedia 2007). <http://en.wikipedia.org/wiki/RFID>

RFID technology can facilitate the business processes of a multinational company.

Radio Frequency Identification technology works on radio waves having a capacity to store information and get recognized by reader. A small chip is attached to the aerial inside the tag which enables the device further to transfer the signals to the reader. Some RFID tags do not have any built-in chips but they work on the principle of reversing the radio waves on the object which makes it possible to read the information. There are two kinds of RFID tags one of them is active tags but it is expensive to incorporate for a small company. The expense is just because as they operate on a battery. They perform within the radius of hundred feet which makes it easier to read multiple objects without any line of sight. The passive tags work on the principle of magnetic field as the radio waves hits the aerial of the chip it creates magnetic field which enables the tag to transfer the information with readers.

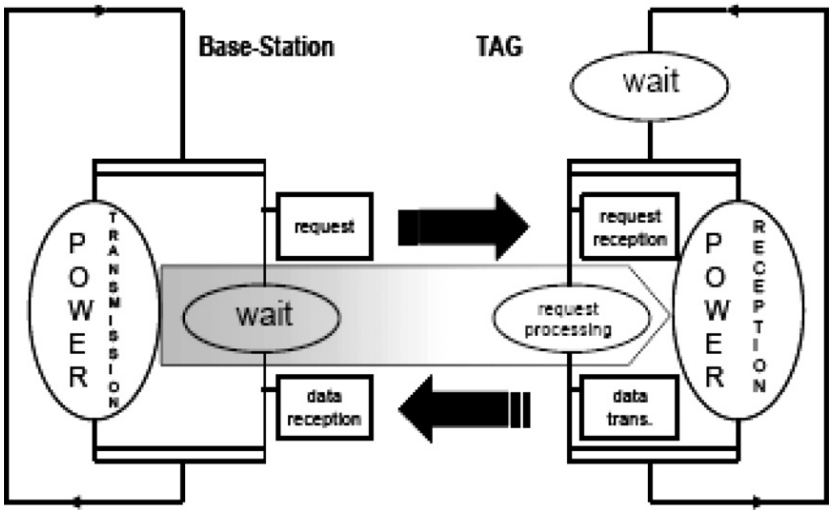

Fig. 1. A Typical RFID system

<http://www.sciencedirect.com.ezproxy.usq.edu.au/science?_ob=ArticleURL&_udi=B6X1X-4R065NM-3&_nxudi=B6V8B-4N3P50M-

1&_rdoc=1&_alid=664341384&_user=1472215&_fmt=high&_orig=search&view=c&_ct=6&_sort=d&_acct=C000052720&_version=1&_urlVersion=0&_userid=1472215&md5=b44961c534bb3d265230e10aad446d62>

RFID can facilitate the business processes of multinational companies in multiple ways. If the company is using RFID tags, the company can benefit both internally and externally. The company can track its inventory in supply chain management and more efficiently the company can manage real time inventory to facilitate the needs of customers within its market. The company can benefit by getting more frequent orders from the purchasers and also, they can get a benefit of technology to become the market leader. The company also benefits cost simply by updating the information on RFID. The process becomes speedier and more efficient. The chances of theft reduce which will resultantly extend the company's cash inflows. The process of computing becomes easier and entire production can be synchronized easily. The cost is dearer to incorporate active tags in organization but the benefits override the expenses.

<http://www.infologixsys.com/products/RFID/Resources/Glossary-of-RFID-Terms/default.asp>

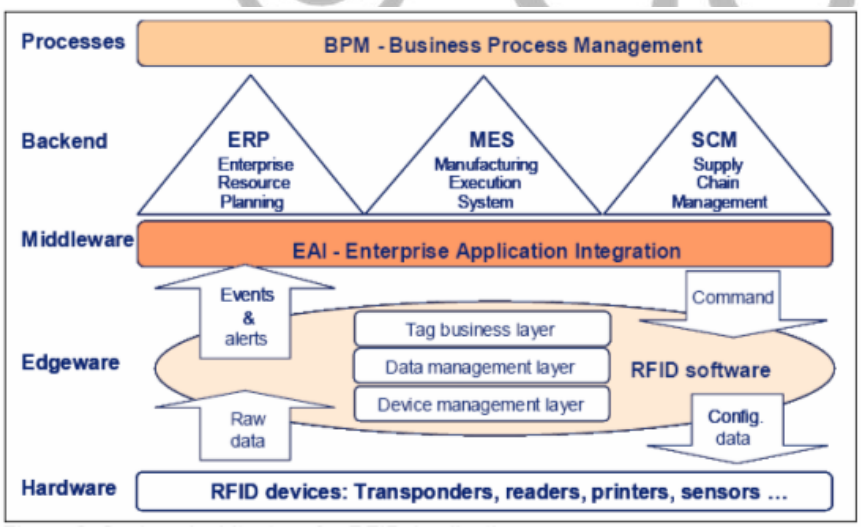

Figure - Example of RFID applications system architecture

[Source: Infineon within BITKOM, 2006]

<http://industry.flexiblelearning.net.au/2006/rfid_scoping_study_8dec06.pdf>

Advantages and disadvantages of RFID with comparison and contrast to alternative solutions

The major disadvantage of radio frequency identification is the high cost for the active tags whereas the barcodes could be most cost effective. The passive tags are comparatively cheaper but active tags are expensive as they offer a wider range without a '*line of sight*' tracking with benefit of tracking multiple objects as they are battery operated but it's quite possible that some objects are not verified by the reader. The barcodes are cost advantage and at the same time they deal with each item individually so it's not possible that any of the items gets missed while scanning.

Radio frequency identification benefits if incorporated in numerous ways, the privilege of achieving greater results is possible under this latest technology. The greater storage capacity and to deliver and receive the information is major advantage what it can offer. The connectivity and the radius of coverage is wider with Radio frequency identification tags and it could be easily scanned with the hand-held scanners or the readers. On the other hand, RFID has a drawback that is if it is adopted in a big warehouse and the tagged items are beyond the reach of radio frequency than it is difficult to trace those items. It becomes costly for such warehouses as they would have to purchase more readers and to get better coverage they can order for RFID tags with more aerials in it.

The information which gets stored on the computer can further processed to the network in the organization at real time as the world-wide gateway – internet makes it possible to run the process easily within and distance places. The management within the organization and outside the organization benefits with the speedy process and at the same time obtains data which is precious to activate the progress of the business with richer information. The chances of internal and external theft within the organization gets reduced with the use of radio frequency identification and the cost saving for the inventory results in profitability to the organization. It is sometimes inappropriate to tag the stock individually if it is cheap in value.

The tracking system should be placed if the individual item is expensive as it results in cost advantage. The barcode is not as transparent as radio frequency identification as each individual product having a barcode needs to be scanned individually. The idea of implementing radio frequency identification is more fruitful rather than having old technology as it has a separate code for each item whereas barcodes has same code for each item.

'*As radio frequency identification is able to gather much information sometimes it is possible that security related issues can be created and for having a strong hold for higher security 'cryptography' will be needed which results in a higher cost though viruses in some cases can still penetrate within the system.'* (Media Wiki 2007). <*http://en.wikipedia.org/wiki/RFID*>.

In many cases where radio frequency identification has been positioned within the product has been strongly opposed as it evades privacy and it can cause cancer. On the other hand RFID only works in a spectrum of 100 feet and a reader is necessary, it is not like television working on a satellite that it can result in evading the privacy. Today most of humans are self oriented and if they find that they may incur many benefits for the product than they are ready to discuss their personal things also. RFID has longer life and it is hard to get spoiled easily whereas barcodes gets spoiled easily which results in more unproductive hours for the organization and cost attached in maintaining would lead to hourly rate of employees and new barcodes.

There are few businesses in which cash registers work without any employees but there is always a possibility if the customer wants to steal something than they can intrude the reader and the tag by covering it up with metal surface and the stolen items cannot be detected. The barcodes are more beneficial as the employee can scan it but on the other hand with a barcode someone can steal the product. It would be important to have barcode with RFID tag so if one fails other works.

<http://www.hightechaid.com/tech/rfid/rfid_facts.htm>

<http://web.ebscohost.com.ezproxy.usq.edu.au/ehost/pdf?vid=9&hid=4&sid=64021123-da94-47d1-80cd-2c1ea553b46a%40sessionmgr3>

<http://www.idautomation.com/rfid_faq.html#RFID_Advantages>

<http://www.hightechaid.com/tech/rfid/rfid_facts.htm>

Explaining successfully implemented of RFID application.

Howell high school is located in the Michigan State of United States of America. It has a large frequency of customers shopping daily at their Fast Track convenience shop. To facilitate the customers and stores need they have implemented radio frequency identification for all four convenience stores. The RFID implementation gives the organization a benefit of real time inventory management, reduced employment cost and reduced chances of theft within the store.

'The store at Howell High is a partnership between Sterling Services and the school's marketing class, which is using it as a real-life business lesson.' (Friedrich 2007).

<http://web.ebscohost.com.ezproxy.usq.edu.au/ehost/pdf?vid=5&hid=113&sid=04bae608-7467-4566-9a67-0521c6d65aaa%40sessionmgr104 >

The marketing class student gets benefited by getting core insight in the advance systems like radio frequency identification functioning and how it helps the business process in efficient and successful manner. The students also receive their share in profitability as they manage few items within the store.

The stock is provided by Sterling to the store before the stock comes to an end. They are able to manage timely dispatch of food because of radio frequency identification ability to update sales report with the central processor every 'fifteen minutes.' The store stock gets filled up without being asked because of successful implementation of radio frequency identification.

Not only the stock is maintained but the cash register gets the benefit of secured payment without a cashier. The concept of let the customer shop on their own has indefinitely helped the organization with increased sales turnover and profitability. If customer try to steal from the shop than radio frequency identification tags sends signals and the alarm gets activated further with the help of video cameras surveillance the robber gets traced and punished easily. The technology implemented has resulted in faster sales with every customer as every item gets scanned on 'Kiosks scanners' automatically and no manual labor is required as authentic bar code system.

The management gets benefited by rich information as the sales report gets updated every fifteen minutes thus they come to know the pattern of the sales during the day and accordingly they can plan their marketing tactics. The management can easily make a graph of the past pattern and expect a busy hour within the store on which they can rely to deliver more food within that time which has enhanced their supply chain management. To manage all four stores is a difficult but to manage data and information is more efficiently complex task.

The radio frequency identification being used allows the Sterling Services to better manage the business at lower the cost. The cost has increased for the organization roughly by 'thirteen cents per piece' but it may be better than spending much on human eye surveillance to avoid theft and employing large staff for managing the timely delivery of stock. Radio frequency identification makes it simpler for Sterling Services to know what stock should be replaced with the expired stock rather than having problems at later stage.

The organization can easily update the information and upgrade a special price for the stock which is going to expire very soon that makes it more cost effective for the organization.

Finally, the radio frequency identification which they have implemented has resulted towards overall growth as the basic information is transferred from the readers to central processors and to the other software's where they can plan for resources and make decisions for better management of the supply chain management which will eventually help in managing the customer relationships.

<http://www.technewsworld.com/story/59479.html>

<http://web.ebscohost.com.ezproxy.usq.edu.au/ehost/pdf?vid=5&hid=113&sid=04bae608-7467-4566-9a67-0521c6d65aaa%40sessionmgr104 >

List of References

Domdouzis Konstantinos, Kumar Bimal, Anumba Chimay (6 September, 2006) 'Advanced Engineering Informatics, Radio-Frequency Identification (RFID) applications', Available on: <http://www.sciencedirect.com.ezproxy.usq.edu.au/science?_ob=ArticleURL&_udi=B6X1X-4R065NM-3&_nxudi=B6V8B-4N3P50M-1&_rdoc=1&_alid=664341384&_user=1472215&_fmt=high&_orig=search&view=c&_ct=6&_sort=d&_acct=C000052720&_version=1&_urlVersion=0&_userid=1472215&md5=b44961c534bb3d265230e10aad446d62> (viewed on 10 December, 2007)

Friedrich Ray (November 2007) Available on: 'Michigan Company Pioneers Unmanned Stores' <http://web.ebscohost.com.ezproxy.usq.edu.au/ehost/pdf?vid=5&hid=113&sid=04bae608-7467-4566-9a67-0521c6d65aaa%40sessionmgr104 > (viewed on 19 December, 2007)

Guest Greta (24 September, 2007) 'RFIDs in Automated Store Suit Students in a Rush' available online: <http://www.technewsworld.com/story/59479.html> (viewed on 11 December 2007)

Halliday Steve (2002 – 2007) 'The RFID facts' available online: <http://www.hightechaid.com/tech/rfid/rfid_facts.htm> (viewed 09 December 2007)

IDAutomation.com, Inc (2000-2007) 'IDAutomation.com RFID FAQ & Tutorial' available online:

<http://www.idautomation.com/rfid_faq.html#RFID_Advantageshttp://go.microsoft.com/fwlink/?LinkId=69157> (viewed on 19 December 2007)

Infologix (2007) 'RFID Glossary' available online: <http://www.infologixsys.com/products/RFID/Resources/Glossary-of-RFID-Terms/default.asp> (viewed on 10 December, 2007)

Mills Alex (August, 2007) 'Radio Warehouse' available online: <http://web.ebscohost.com.ezproxy.usq.edu.au/ehost/pdf?vid=9&hid=4&sid=64021123-da94-47d1-80cd-2c1ea553b46a%40sessionmgr3> (viewed on 10 December 2007)

Stacks G & Karper E (1995-2007) 'Annotated Bibliographies' available online: <http://owl.english.purdue.edu/owl/resource/614/01/> (viewed on 19 December, 2007)

Wikimedia (16 December 2007) 'Radio-frequency identification', available online: <http://en.wikipedia.org/wiki/RFID> (viewed on 10 December, 2007)

White house Ian, Ragus Marcus (November 2006) 'E-learning using radio frequency identification (RFID) device scoping study' available online: <http://industry.flexiblelearning.net.au/2006/rfid_scoping_study_8dec06.pdf> (viewed on 08 December, 2007)

Annotated Bibliography

Domdouzis K, Kumar B & Anumba C (6 September, 2006) 'Advanced Engineering Informatics, Radio-Frequency Identification (RFID) applications', Available on: <http://www.sciencedirect.com.ezproxy.usq.edu.au/science?_ob=ArticleURL&_udi=B6X1X-4R065NM-3&_nxudi=B6V8B-4N3P50M-1&_rdoc=1&_alid=664341384&_user=1472215&_fmt=high&_orig=search&view=c&_ct=6&_sort=d&_acct=C000052720&_version=1&_urlVersion=0&_userid=1472215&md5=b44961c534bb3d265230e10aad446d62> (viewed on 10 December, 2007)

The authors Domdouzis K, Kumar B & Anumba C have prepared an article on radio frequency identification and its applications. This paper provides insight into the technology of RFID and its application with an overview of diagram that how it helps the organizational process. The source has been helpful in learning and understanding the process of RFID.

Friedrich Ray (November 2007) Available on: 'Michigan Company Pioneers Unmanned Stores'
<http://web.ebscohost.com.ezproxy.usq.edu.au/ehost/pdf?vid=5&hid=113&sid=04bae608-7467-4566-9a67-0521c6d65aaa%40sessionmgr104 > (viewed on 19 December, 2007)

The author Friedrich Ray has prepared an article on the successful implementation and application of RFID technology in Howell high school of Michigan. The article is very interesting and it explains how the business works at Howell high school with the adopted system. The source is reliable as it matches with other sources which were searched to provide with true and fair information. The source has not been helpful in providing any limitation or problems faced by the adoption of the technology. The limitations faced by the school means more importance for better growth even though its successful it does not means that it could not be more successful than what it is currently.

Guest G (24 September, 2007) 'RFIDs in Automated Store Suit Students in a Rush' available online: <http://www.technewsworld.com/story/59479.html> (viewed on 11 December 2007)

The author Greta Guest has prepared an article on Howell high school and claims that it is the first school to successful implement the technology of RFID in its infrastructure which has enhanced the school stores ability to manage the store without a single employee. The source available is reliable and extension with other sources compared for the findings of successful organization with adoption of RFID. The positive side of RFID has been emphasized in this article whereas negative is not given any importance. The other articles discuss that if someone wants to steal than they can intrude the RFID tags simply by covering the objects with metal or water.

Halliday S (2002 – 2007) 'The RFID facts' available online: <http://www.hightechaid.com/tech/rfid/rfid_facts.htm> (viewed 09 December 2007)

The president of high-tech aid has prepared an article on the facts of RFID in which he discusses that evasion of privacy is not possible under RFID. The negative points which have been kept forward on frequent basis without knowing what actually RFID is, Steve Halliday

tries to overcome the hindrance of a fallacy that RFID can evade privacy if implemented. Rather he has come up with the actual facts that RFID cannot evade privacy if implemented within a product also. As such there is no other source agreeing with Steve Halliday but in contrast Wikipedia says that RFID can evade the privacy. After a substantial study on RFID in my opinion RFID cannot evade the privacy if readers are not within the hundred feet of the tags but if it is within the range and if privacy is the issue than certainly RFID can breach the privacy policy and cannot benefit the organization as people will protest them.

IDAutomation.com, Inc (2000-2007) 'IDAutomation.com RFID FAQ & Tutorial' available online:
<http://www.idautomation.com/rfid_faq.html#RFID_Advantageshttp://go.microsoft.com/fwlink/?LinkId=69157> (viewed on 19 December 2007)

IDAutomation.com is a website which provides a detailed study of advantages and disadvantages of RFID. The document is set up in an easy manner for better understanding the concept of RFID. The sourced document matches with other research undertaken for the advantages and disadvantages of RFID but the source document has helped a lot in gaining further understanding on the technology.

Infologix (2007) 'RFID Glossary' available online: <http://www.infologixsys.com/products/RFID/Resources/Glossary-of-RFID-Terms/default.asp> (viewed on 10 December, 2007)

Infologixsys is a website where it provides a glossary for the industry solutions and they provide mobile intelligence for businesses. The glossary is always helpful to know what exactly an industry term stands for as it gives a precise definition. The definition focused on this website matches with other websites. The website could have been more beneficial if it could have delivered more knowledge on industry wide learning.

Mills Alex (August, 2007) 'Radio Warehouse' available online:
<http://web.ebscohost.com.ezproxy.usq.edu.au/ehost/pdf?vid=9&hid=4&sid=64021123-da94-47d1-80cd-2c1ea553b46a%40sessionmgr3> (viewed on 10 December 2007)

The author Mills Alex has prepared an article on Radio Warehouse and he has explained dual technologies that are RFID and barcodes with providing core insight on its advantages and disadvantages. The source is reliable and matches with findings in other articles prepared by other authors. The article is truly about the implementation in warehouse for a corporate sector. The source could have been more helpful if it would have provided an overall picture of the technology for all segments of the business.

Stacks G & Karper E (1995-2007) 'Annotated Bibliographies' available online: <http://owl.english.purdue.edu/owl/resource/614/01/> (viewed on 19 December, 2007)

The authors Geoff Stacks & Erin Karper have given summary on annotated bibliography. The source is very helpful for students who do not know how to write annotated bibliography. The way to undertake research project and to summarize the research findings is very helpful and is a correct way of referencing. Here on the website it's given in questions format and after understanding it the requirements of report for question 2 in assignment 1 has been fulfilled.

Wikimedia (16 December 2007) 'Radio-frequency identification', available online: <http://en.wikipedia.org/wiki/RFID> (viewed on 10 December, 2007)

Wikipedia is a website that provides a free encyclopedia in a wide range of article.

The article "Radio frequency identification" gives extensive information on radio frequency identification and its application with the usage in the industry. The article also provides table of contents and the industry terms are further defined by simply clicking on the provided link Wikipedia which has good source of references but some information is not referenced and cannot be measured on reliability. The most important thing which it makes clear is what and how the technology is with its pros and corns. The source could have been more helpful if it provided more information on business with a short video clippings of how exactly the tags looks like.

White house I & Ragus M (November 2006) 'E-learning using radio frequency identification (RFID) device scoping study' available online: <http://industry.flexiblelearning.net.au/2006/rfid_scoping_study_8dec06.pdf> (viewed on 08 December, 2007)

The author Ian White house and Marcus Ragus has prepared an article on e learning using radio frequency identification device scoping study. The article is published by Australian Government department of education, science and training to further facilitate the research for studies. The article is very helpful to know the industry wide processes with issues, strategy

and case studies on incorporating RFID within the framework. The sourced document is very useful in terms of better understanding and knowing the industry wide applications. The article could have been more beneficial if it could have pointed out the successful organization which has adopted RFID, however it is very well connected with the industry outcomes that why it has not been successful. The use of this article could be taken in consideration to develop and market the technology further.
