

Role of RFID Blocking Wallets

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Abstract— The research paper is documented to provide a prudent analysis of the RFID Blocking Wallets-checking its feasibility. The research paper starts with an introduction of RFID devices and blocking wallets.

This is followed by the working of blocking wallets and its need for protecting RFID devices. Then the paper gives by an account of the positives and negatives of the RFID Blocking wallet.

The feasibility of RFID blocking wallet is examined for the Indian market space. Also the current levels of use of the wallet and its alternatives are made available.

The conclusion deducted from the research paper is that though RFID devices in general should find a foothold in the market space, the blocking wallet may not find such an easy passage. A number of cheaper variants for the same purpose will be a viable alternative.

Keywords-*RFID; RFID Blocking Wallet; Faradays cage; Aluminum Foil; Meta Material; Indian Market Space*

I. INTRODUCTION

Radio Frequency Identification (RFID) is a wireless identification system that uses the radio frequency waves for identity transmission of any object or a person.

RFID based devices pertains important information of an individual.[1]

With the use of such devices being on a rise, there have been efforts in the past to protect this information from others who are not meant to use this information.

RFID Blocking Wallet is a Wallet designed to keep RFID devices safe and secure from unethical transactions. RFID blocking wallets block the radio frequency signals that are emitted from the RFID devices within the wallet like credit cards, passports, etc. [2]

These contents may have certain important information worth protecting from unsecure RFID readers.

Proposed Work- Research Paper has the required specifics of the materials that can be used for making the RFID Blocking wallets. Also documented are the needs, advantages and Limitations of the device. Also, tested is the feasibility of implementation in a market space which is not acquainted with Blocking Wallets.

The following contains the uses and limitations of the blocking wallets, with an account of the alternates.

II. WORKING

A. Basic Working

Since RFID wallets are designed as protective shields for RFID devices, thus these wallets should be such that Radio Frequencies do not pass through the Wallet.

Radio frequency signals can be stopped by either water or metal as a medium. Blocking Wallet uses Metallic (mostly Aluminum) shield for impeding the Radio signals from RFID devices. Above this shielding layer, there is leather which covers up the wallet. Thus the wallet has a usual look though it has an increased weight. [3]

B. Materials Used

As stated earlier, RFID devices can be protected from identification only by using Metals or Water as a medium. Since using metals is the viable option, Aluminum, Titanium, Brass, Tin are some

metals that helps in providing safety to RFID devices. This is analogous to Faraday's cage.

Aluminum Foils used at home is of the thickness of 4.95 microns which is enough for most readers available. A thickness of 27 microns [4] can guarantee the safety of RFID devices.

Tin foils which were used earlier in place of their aluminum counterparts have become obsolete due to their cost. However they are stiffer and hence provide a better material for Wallets.

III. NEED OF PROTECTION

Blocking Wallets are a useful protection for RFID devices in various important sectors like Credit cards, Passports, Military, etc.[5] Thus it is imperative to have better protection for such security concerns. These Wallets provide just that.

These wallets deal with the following concerns-

- Readability through any Reader- a RFID Tag is indifferent to all the Readers. The Reader is a portable device. Thus there is a security concern. Thus RFID Tags can be read without the user knowing about it.
- Lack of Encryption in data streaming- While data is streamed between tags and reader, it can lead to breaches. The Device can be further corrupted by the breach.
- Jamming of RFID networks- RFID networks can be jammed rather easily. The Jamming is done using Energy at the right frequency. This may lead to some damage to RFID devices.
- RFID Tag and Reader Collisions- RFID readers' and tags' collision takes place when two or more reader and/or tags are there. This makes the tag and the reader unable to respond to simultaneous queries leading to chaos. Blocking Wallets can help the tags to respond only when needed.
- Tracking of Tags- Tags on some devices can be used to track the movement of the

individual. These wallets can thereby help in avoiding such situations.

A. *Useful Attributes*

Blocking Wallets protect the RFID devices from Cloning, Identity Theft, Tracking and denial of service.

Protection of RFID is not only related to privacy and security concerns. They also magnify the utility by providing service throughout.

RFID Blocking Wallets provide a single storage space for all the RFID devices to be kept safely. Thus they help in keeping all devices organized.

The Wallets are having various slots for various RFID devices. They thus lead to an increase in the life time of the device.

Wallets costs only around 20\$, though the costs are variable. It claims to secure all the devices stored within completely. Thus these wallets are affordable and low profile.

B. *Limitations*

Some of the major Limitations relating Blocking Wallets are-

- Perfection Required- Wallets are not guaranteed to work properly. Some handheld readers are still able to read the RFID devices.
It is vital that the Wallets are made perfectly.
- Shortage of options- The Blocking Wallets are still in their primary stages of application.
There is a need of perfecting the wallets for the users' needs.
- Other Cheaper and Lucrative Options [6] - the Wallets' function can be performed by an aluminum foil properly draped across a device. Though the aluminum foil may not be as reliable but it would be cheap and home-made.

- Outdone by single covers-The security can also be established through covers made uniquely for each of the devices. For example, RFID passports are usually kept in their special protective covers. It costs only around 15\$. So rather than keeping it in the Wallet for safety, it can be carried around in its cover. This also means protection from pickpocketing and petty thefts.
- Not a Permanent Solution- As technology advances there will always be new ways to steal people's personal information. Therefore blocking wallets may not be able to provide the required protection.

shows the low requirement of devices like blocking wallet.

A. Current Levels of Usage

RFID blocking wallets were first introduced on the global stage in the start of 2006. Seven years on, India is yet to formally produce Blocking wallets on a large scale.

A major reason for the above stated fact lies in the low market share of RFID itself. RFID, though pinned to grow due to low entry barriers and high profits, has not yet been as popular as expected.

With an expected CAGR of 18% globally [8] and 13% in India, along with favorable governmental policies, RFID is set to grow in the near future.

With RFID growing, RFID safety devices can also be expected to grow. This will however take some time as seen on the global level-8 years. With that span of time, it can be prudently commented that Blocking Wallets currently in the markets would face competition from some kind of disruptive safety device.

B. Alternates

There are various alternates to the blocking wallets which vary in simplicity and effectiveness. As mentioned earlier, metals and water have the ability to block the radio frequency waves which is the essential characteristic of a blocking or safety device.

As a home-made alternate, aluminum foil wrapped using duct tape across a regular wallet can hold effective for most of the readers. A tin foil or an aluminum alloy can also be used for the same case as tested for a RFID tag.

Booster bags- shopping bags [9] wrapped in metals like aluminum can also be used by making them in a smaller customizable size.

Moreover metals like titanium and brass can be considered to increase the fashion appeal of a wallet.

IV. INDIAN MARKET SPACE- OVERVIEW

RFID in India has been deployed, though at a slow pace, since 2000. [7] However, RFID market is driven by the requirement of the various Industries like Infrastructure, Logistics, Roads and Railways. Major IT companies like Honeywell, Infosys, Wipro and Siemen have ventured into RFID successfully providing solutions to various industries as listed below:

TABLE I. IT SECTOR RFID VENTURE

<i>Company</i>	<i>Ventured Sector</i>
Wipro	Retail
Infosys	Airline Baggage
Honeywell	RFID Readers

a. Sample of a Table footnote. (Table footnote)

RFID tags have been dominated by a large number of SMEs, various Chinese and American Companies.

The Market for the safety of RFID devices in India is still ripe, with no major investments being made in the same. There have been no recorded cases of RFID theft reported in India in 2011. This

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Security concerns have always been a major deterrent to the popularity of RFID and therefore research surveys have proved that RFID safety devices would find a popular base. The blocking wallets however would face a tough competition from the cheaper alternates listed above.

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REFERENCES

- [1] Implementing RFID – RFIDjournals.com
<http://www.thinkgeek.com/gadgets/security/8cdd/#tab1>.
www.alientechnology.com/docs/SB_RFID_Retail.pdf
Shrouds of Time: The History of RFID – Whitepaper publishing
- [2] <http://www.technovelgy.com/ct/Technology-Article.asp?ArtNum=20>
<http://www.informationweek.com/news/52601030>
<http://www.technovelgy.com/ct/Technology-Article.asp?ArtNum=6>
- [3] “RFID Secure Wallets”: Instructables.com
“RFIDtec100”-pacsafe.com
- [4] “Materials for RFID Blocking Wallets”:
Instructables.com
(<http://www.instructables.com/answers/can-I-make-an-RFID-blocking-wallet-using-aluminum-/>)
Research_dataset_Evaluation_for_Technologies- IJCAM journals
- [5] Issues with Supply Chain and RFID in the Retail Industry- Kumaravel Thangamuthu, SAS Institute Inc., Middleton, MA
RFID applications in manufacturing _draft 7_.pdf
SB_RFID_Retail.pdf
http://www.aimglobal.org/technologies/rfid/rfid_Glossary.asp, <http://www.rfidjournal.com/article/view/1339/2>

www.fieldtechnologies.com
- [6] “RFID safety Concerns”: Presentation.com-
<http://freedownload.is/ppt/rfid-8838732.html>
“RFID protection techniques”-
<http://smallbusiness.chron.com/protect-yourself-high-tech-rfid-identity-theft-3285.html>
- [7] CMR India- “Why RFID should be in India”-Faisal Kawoosa
RFIDjournals.com: “Wipro starts a new Journal”
Techtree.com: “Infosys offers RFID services”
”http://www.securityinfowatch.com/press_release/10492011/why-walmart-is-adopting-rfidInTech”
- [8] India RFID Market- Frost And Sullivan:
<http://www.frost.com/sublib/displayreport.do?Src=RSS&id=P401-01-00-00-00>
<http://wordinfo.info/unit/3988/ip:1/il:R>
Using_rfid_technology_for_simplification_of_retail_processes.pdf M. Young