Abstract—Acceptance of the use of Radio Frequency Identification is increasing day by day. The mass-market attention towards RFID can only be gathered if this technology can provide useful features to users for daily life without compromising the security concerns. Although the research is on its way to give many useful features like medical support for doctors using RFID Components, RFID-Enabled Electronic Seals and many other features. We will discuss the features of RFID Components which should be provided into the Pakistani market while keeping in mind the security concerns so that the Pakistani Market can get most of the benefits from this technology.

Key Terms – RFID, Security, Radio Frequency Identification

I. INTRODUCTION

Radio Frequency Identification consists of an item also known as tag integrated with an animal or any product for the tracking of radio waves. These tags can transmit and receive data from much larger distance and can also transfer data or any data beyond the line of sight [8].

Normally these tags consist of two parts. One is a combined chip for processing and retaining the data and also used for demodulation and modulation of the information and additional specific tasks. Other part contains signal transmission equipment and a specified antenna. Usually there are three kind of tags, first kind is an active tag, these tags are capable of transmitting signals as they have a dedicated battery installed and these tags work without any other power source, passive tags, these tags need no internal battery as they operate on exterior power source to generate any signal to act or react. These kinds of tags are capable of having much larger binding and have a wide range of reading capacity.

As there are many other technologies today which are cutting-edge research based, the RFID technology also has a promising and provocative features. And thus this technology is spreading exponentially in few areas, but
there are many features which are dependent on other areas of technology and because of those limitations this technology cannot get the required recognition. [8]

Tags can be active or passive, read-only, write-only, or read-write. Below is mentioned the description of each:

Active tags have a battery that runs the microprocessor circuit and allows the tags to send a stronger signal to the reader, and these tags have higher read range which can reach up to about one hundred feet. Passive tags do not have any kind of internal battery installed, rather they get power source from a requesting party which is usually a reader and a reader transmits electromagnetic signals which activates the antenna of the tag and supply electricity to electronic circuits of the tag. The chip module and then waves the tag sends the reader. Passive tags have shorter range than active tags which ranges from ten to Thirty feet. Tags which are capable of only reading contain data which acts as sequential tracking number and these numbers are burnt when tags are manufactured by the distributor or may be manufacturer. Read only tags are normally lower in price because they are not able to have any data or information other than their numbers or tracking information. All the modifications of these tags should be stored in the application software that should be capable of tracking down activities in stocks by each and every unit [3]. There are tags which only allow data to be written only once, this type of tags permit the party which is using it to burn the information or any data on the label once during the production or distribution. This information may be any number or data. There are tags which allow read and write functions simultaneously and they can also update or synchronize original information which was stored previously. [10]

II. LITERATURE REVIEW

Charles Mutigwe and Farhad Aghdasi in their paper about Research Trends in RFID talked about mass-market adoption as the RFID has many powerful features but they are not as much popular than they should be and they discussed that there are few things which needs to be considered before we can further move to get more market. According to their research the following areas should be considered before the RFID can get the massive market attention”.[3]

- Privacy and security
- Antennas
- Polymer electronics-based RFID devices
- power management circuits and techniques
- efficient RF spectrum utilization

I strongly agree with these people but they did all the research for general public and the issues discussed in that Research Paper are concerns of developed countries. My point is to develop a research paper which should focus on security concerns and technical features of RFID Technology Enabled devices and keeping in mind the concerns of Pakistani People. In the market of Pakistan, security features required and the conditions for which these devices are designed, can be critical and should be designed with great care as these devices can give benefits to the public as well as these can harm if not protected properly.

SATO America, Inc did a research on RFID standards as the technology required different bands on which the components need to be operated and they proposed standards on which these components will be operated. The organization defined that everyone who is using RFID components will acquire bands from a central agency which will check that there should not be any duplicate frequencies and data security should not be compromised. [2]

I will study the standards in Pakistan for giving out Radio Frequency Bands and will suggest the standards that could be implemented locally so the security should not be compromised. These standards will match international standards and organizations will make sure that the frequencies will be issues and controlled from a central location.

While promotion might suggest new conversely in RFID but this is not a new technology. RFID was initially considered while second world war was in progress when Allied aircraft were transferring transponders which were recognized friendly aircraft. The cost and size of tags is been following the evolution since then. And according to the Moore’s law even razor blades are now capable of integrating these kind of tags into them. As a matter of fact this technology is applicable in public products for years like toll plaza. [12]
Tasks like watering your lawn on daily basis can be hectic but if you deploy RFID based automated system these tasks can be much more simple and hassle free. [12]

There are many uses of this technology like others but it is very useful for placement in the book stores. These tags have gradually started to replace the previous codes used to be on books. The RFID tag can consist of information for identification, like the author of a book or any other type of information. It can be changed or embedded into the security code, providing a unique way of catalog identification, classification and management by staff for the customers. [2]

Although there is debate about when and where this technology was integrated into the libraries, in early 90s it was planned that this technology can improve flow of daily tasks in normal libraries.

The data in tags are weak and there is a risk of data leakage or any other type of corruption. At start the thing which should be taken care of is the vulnerability of the information residing inside the tag. The security of the tag is referenced as the strength of the security and encryption which is currently in use, the processing speed of tag and the duration in which a secure connection is established. [13]

Second generation tags now meet the standards of current business needs by securing information between tags and readers. In extreme cases, these disturbances may include the deliberate encoding process for these tags to consider the mass stray, amount. Organizations which choose some low secure technology are providing opportunities to their competing organizations for less costly passively gain of data for their suppliers.

All the organizations are not identical in terms of financial stability for the integration of tags which they want in their manufacturing systems. Technically, the tags of the previous generation cannot meet the security policy of the IT Companies in current business needs. [13].

### III. RFID IMPLEMENTATION POSSIBILITIES

RFID devices are now commonly used for tagging purposes on international level. Information can be stored and retrieved easily and can be modified. We can use this technology on national level to get our system digitalized and enhance the level of information sharing, management and centralization. The possible implementation can be a use of RFID components in
National Identity Card so that it can retain Personal, License information in a single card. This can save a lot of money and it will be much easier for a person to carry only a single card and have all the information on it. This will increase the data centralization and reduces the cost. As we all know there are multiple departments which have our data and our data is duplicated and information is placed on multiple locations and it’s a very hectic job to get your cards and licenses renewed; but by using this technology all the cards can be implemented in one and cost, time and effort will be much more efficiently utilized.

IV. RFID SECURITY CONCERNS
As we know the size tags which are very small as it can be embedded in skin similarly it can also be integrated with National Identity Cards. All the licenses and password information can be stored in it so that all relevant data of a citizen should stay in one place and can be changed on demand without replacing the card but most vulnerable reservations can be realized with these tags which are able to transmit personal information into the air; but if it’s used with personal information holder cards like Credit Card so it can be easily tracked and information can be leaked as the information is aired. The information spray is done only by active RFID components.

V. RFID CHALLENGES
Although security is embedded in tags but there are security problems inherent in these tags on the cards that need to be taken care of. A chip is tiny and has a sum as little data storing capacity and data retention memory, which bounds them in terms of length and number of security codes, this makes it a challenge. If data is burnt into the tag one then the data has been engraved on a chip, it is here to stay and it is difficult to update. There are few types of chips are capable of rewriting. [14].

VI. RESOURCES USED FOR PAPER DOCUMENTS
As we all know that NADRA is handling most of our identification, e-governance and secure documents information and other departments do keep records of our licenses, other legal information. All these departments keep record of our information and they link up at time when any other organization required verification of a person. So all the information for a single person is kept in separate department and they don’t have a centralized place where they can cross check it. If anybody/organization required any verification then he/she has to go to every department and get this information. It’s a very hectic job and mostly it’s required on when you need to enter into a secure department for job or need to go abroad.

Even the academic information is also not authenticated until you get every degree and certification verified from its concerned department manually.

NADRA currently holds 5 types of document for a single person i.e. CNIC, FRC, CRC, NICOP, POC and they all are separately printed and these are apart from Academic documents, Security Cards and Licenses. They are used by almost every citizen of this country and they require additional paper and other services to cost and it’s almost useless to store relevant information in isolated places.

VII. RFID IMPLEMENTATION AND RECOMMENDATIONS
RFID Technology can be used to create a single card for a person whose personal information will be stored in NADRA’s Central Data Warehouse and this information will be linked via a single card. This card is used for verification and other authentication purposes. This information can be easily verified through NADRA verification devices which already exist and can be done via an SMS services as well. This card can be renewed without the need to replace the physical card. The card will remain the same and organizations can refresh and integrate their data on the backend database placed at NADRA Warehouse. The card will be able to carry basic information about the person and his basic properties. It can carry up to 64Kilo Bytes of data and this capacity is enough for carrying basic information of this person.

As we all know NADRA already has a verification system and it uses it to facilitate different organizations to cross check and authenticate persons for particular tasks. This card also requires a verification machine and it will be used the same way NADRA is using its verification module.

The card will contain the important information of a person and it can be hacked so to protect from this type of loss; first, the information should adequately protected. Signals used in this technology use 128-bit encryption techniques and it is also recommended that you should not transmit the codes and names of tags. The card should use an encryption key code that can be transformed into the information required. These encryption keys should be dynamic and every time when the card is synchronized with the server it should be changed and managed on the centralized server. This will protect the personal information from being stolen.

VIII. CONCLUSION
Appropriate use of the latest technology can save a lot of money and effort. This is an idea of how we (at national level) can use the RFID Technology to reduce the cost of cards used for identification purpose and avoid the reprinting and isolation of data placements.

IX. LIMITATIONS
I could not contact the ministries for any cost estimation.
I was unable to implement any prototype as it was only possible with the collaboration of different ministries.
It’s cost effective solution but for implementation it requires the attention of higher level management of Pakistan.

X. ABBREVIATIONS AND ACRONYMS

RFID
Radio Frequency Identification

NARDA
National Database and Registration Authority

CNIC
Computerized National Identity Card

FRC
Family Registration Certificate

CRC
Child Registration Certificate

NICOP
National Identity Card for Overseas Pakistani

POC
Pakistan Origin Card

REFERENCES