

RESEARCH ARTICLE

RFID APPLICATIONS IN INDIAN CONTEXT

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ABSTRACT

This article surveys recent applications of Radio Frequency Identification (RFID) in India and helps entering with better understanding the world of RFID systems. RFID tags are small, wireless devices which helps to identify objects and people. These tags can either be passive, active or battery -assisted. RFID reader types are fixed, mobile or handheld units. Which type to use is governed by the application or environment in which they will be utilized, RFID technology uses digital data in an RFID tags, which is made up of integrated circuits containing a tiny antenna for transferring information to an RFID transceiver. Paper examines current applications and future scope of RFID and its applications in India.

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INTRODUCTION

Radio Frequency Identification (RFID) in short is essentially an enabling technology. The unique advantage of RFID is that it eliminates the requirement of human intervention thus providing immense business value. RFID makes use of radio waves to transmit identity of a person or an object or even an animal wirelessly. On RFID intervention being used extensively, neighbourhood post offices are using RFID to track lost parcels, Indian farmers keeping a tab on their cattle using RFID, these are two small examples of massive RFID deployment.

RFIDs are sensed by sensors which are called as RFID tag readers. Applications of RFID includes RFIDs for tracking or automating files, airlines uses the technology to track the location of luggage trolleys, construction companies uses RFID tags inserted to concrete blocks for quick dissemination of results over the internet. RFID saves lots of wasteful expenditure along with the chances of human error. [1]

Current Applications

The most common applications of RFID in Indian context are as follows:

- Web Based Asset Management [11]
- Inventory Management [12]
- Access Control [9]
- Student Attendance System [10]
- Vehicle Tracking [5]
- Parking Management [6]
- Inventory Control Functions – Receiving, Picking and

Ship confirmations are all being deployed with RFID as the main technology. [16]

- Laundry Automation- RFID based laundry management system, which provides them with an excellent solution to trace the clothes throughout its complete cycle of its arrival in the laundry to its dispatch. The RFID tags which are attached to the clothes are read when clothes enters the facility. Once the unique tag IDs for each of the cloth is obtained, the application software updates the database with related information about each clothes and generates reports at various stages. [13]
- Event Management- Multiple RFID readers installed at multiple locations at the event venue and RFID tags are carried by each visitor. Identification of unlimited no of visitors can be done from a distance of multiple meters by sophisticated HF/ UHF long- range RFID readers with a completely non-line of sight communications and with no manual intervention. Real time updates are displayed instantly at the venue and also they reached a wide audience outside through social media. [14]
- Hospital management- High frequency RFID solution system enable healthcare providers to track hospital supplies, medical equipment and patient records. Even RFID wristband are used for patients monitoring, medication records and new-born's tracing in hospital settings. Desktop HF reader and PDA Handheld reader are used for wristband information collection and transfer.[15]

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**Future Applications**

- RFID enable for warehousing agro based product-The grade material, age and quantity stored specific crate, can be identified. This can be done by tagging passive RFID to the crates. This process has a RFID scanner which will scan the cart at receiving dock and identify its grade, weight, location, crate number and store data according to it for dispatching it from warehouse. [8]
- Centre For railway information system- The center of railway information of India plans to use RFID to improve the wagon management system of railway. They have proposed to have a RFID tags or chip embedded in all the wagons and provide sheds with handheld devices that would read the chip and register data. [4]
- RFID Technology in car- A lane level navigation system is proposed in which car having the RFID reader is passing along a road on which RFID tags are installed. Thus, transport department will able to better signs if they are reviewing the RFID reading of car when it is changing a lane suddenly.[5]
- RFID based enterprise intelligence- Enterprise intelligence include misplaced object alert service which tracks the movement of user and object and notify the user when he thinks he or she had misplaced the object. When such situations occur, the system suspect the object and alert user via email or phone. RFID tags are attached to the objects and the owner to fetch their location.[9]

**Rfid To Define Individuals Identity**

RFID's to replace all the Identity Cards that are issued to Citizen of India:

In this paper, there are two scenarios have been analyzed:

- Current scenario of usage of legal documents to define individual identity and
- Proposed scenario of usage of RFID to define unique identity of Indian citizens.

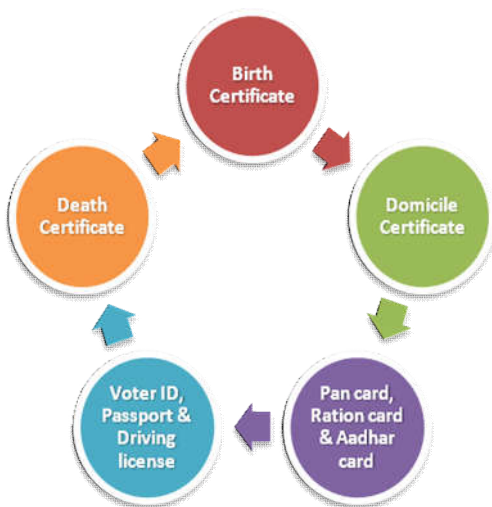


Fig 1 Illustration of Current scenario of usage of legal documents to define individual identity

Current scenario of usage of legal documents to define individual identity:

The typical cycle of using legal identity documents starts right from the birth of an individual and continues till their death!

It typically covers birth certificate, domicile certificate, pan card, Aadhar card, voter ID, passport, ration card, death certificate.

Proposed scenario of usage of RFID to define unique identity of Indian citizens:

Above mentioned all legal identity documents are proposed to be replaced by "A single unique RFID card!"

RFID is proposed to be link up with all the current identity proofs and enable various applications to be operated under single identity domain.

It is proposed with the following mentioned objectives:

- To achieve transparency.
- To compress multiple documents in to single handy card.
- To achieve error free election procedures.
- To reduce the process time for various legal documentations by enabling e-data.
- To ensure Indian nationality by enabling on-the-spot verification of RFID tag through scanning.
- To enable complete cash-less transactions as it is linked up with bank accounts.

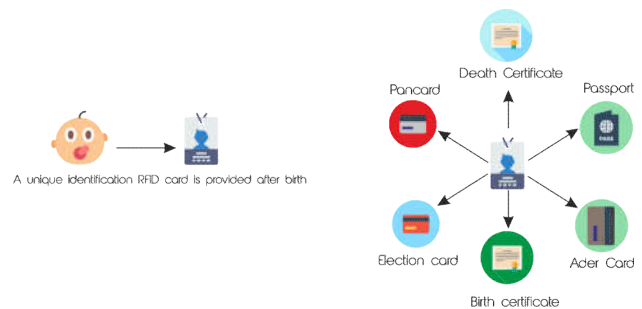


Fig 2 Illustration of Proposed scenario explaining the usage of RFID to define unique identity of Indian citizens

As per proposed scenario, a unique RFID card will be issued to an individual after birth, which will act as a unique identity card. The e-data of all documents will be linked up with this RFID which are issued to Indian citizen and are considered as an identity proof.

This will enable the citizen a facility to use a single RFID card to serve multiple purposes, as all the data will be accessible when needed.

It also enables our government to achieve all the above objectives along with transparency and security as it will be easy to check identity of an individual any-time any-where.

**CONCLUSION**

In this paper, possible usage of RFID technology is discussed in Indian Context.

It explains the mechanism to reduce the governmental cost per individual through usage of RFID.

It also explains that, if implemented properly, RFID will enable paper-free unique individual identity to every Indian citizen.

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