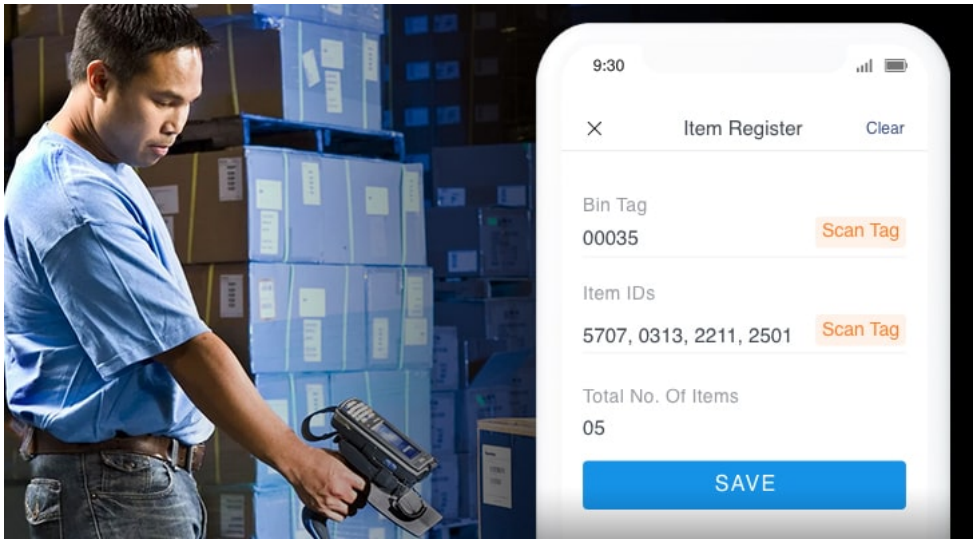
peerbits

Logistics

Complete guide on RFID and its applications in supply chain management and logistics

We all love visiting shopping malls and supermarkets and why not? We get to buy our favorite clothes, household item, and groceries there.



However, there's a part that well hate the most – to wait in the never-ending billing queue

We all have to wait and see the biller scanning all the items one-by-one. At that time, we all would've at least wished once to have a technology that can curtail this lengthy process.

If you too wished the same then I have good news for you. RFID (radio frequency identification) is a cutting-edge technology that has made this a reality. So, let's see what RFID is?

peerbits

RFID stands for "radio frequency identification". It's a technology that captures digital data encoded in smart labels and RFID tags through a reader via radio waves.

RFID serves a similar purpose to that of bar code or a magnetic strip of an ATM card where data from a label or tag is captured by the device and then later stored in the database.

However, RFID works better than barcode and ATM magnetic strips. The most significant advantage of using RFID over barcode is that it doesn't need to be placed or positioned relatively to the scanner.

The other advantage is that with RFID you can scan more than one object at a time unlike barcode which saves loads of time and energy.

We have all seen the kind of struggle that clerks go through at stores while ensuring the position of barcode, so that it can be read.

Moreover, the ATM cards also need to be swiped through a special reader.

RFID solves all these issues since it works within the few feet of the scanner. For an instance, to scan a bag full of groceries, all you must do is to set the bag on the scanner without worrying about its proper positioning or placing.

Moreover, the clerk doesn't have to scan objects one by one like in the case of a barcode.

How does it work?

RFID belongs to a group of technologies referred to as Automatic Identification and Data Capture (AIDC).

AIDC methods automatically identify objects, collect data about them, and enter those data directly into computer systems with little or no human intervention. RFID methods utilize radio waves to accomplish this.

At a simple level, RFID systems consist of three components: an RFID tag or smart label, an RFID reader, and an antenna.

RFID tags contain an integrated circuit and an antenna, which is used to transmit data to the RFID reader (also called an interrogator).

The reader then converts the radio waves to a more usable form of data. Information collected from the tags is then transferred through a communications interface to a host computer system, where the data can be stored in a database and analyzed later.

peerbits

1. RFID tag

2. RFID reader

RFID tag

RFID tag consists of an embedded transmitter and a receiver. RFID component comprises two parts:

Integrated circuit:- It's used for storing and processing the information.

Antenna:- It's used to transmit and receive signals.

RFID tag also has a non-volatile memory storage which includes either programmable or fixed logic for sensor data and transmission.

Tags can be categorized as:

Passive:- This tag remains dormant since it has no battery. It uses reader's signal energy to turn on the tag along with reflecting a signal back to the reader that carries the information.

Active:- Active RFID tags have a battery in it that transmits signals periodically. These tags have range up to 100 meters due to the presence of a battery. Due to this, active tags are useful in location tracking applications.

Battery-assistive passive:- These tags do contain a battery but it doesn't transmit signals periodically like that of active RFID tags.

The battery is used to turn the tag when it receives a signal which enables all the energy from the reader's signal to reflect.

RFID reader

RFID reader consists of an interrogator which is nothing but a two-way radio transmitted-receiver also known as transceiver.

The prime function of transceiver is to transmit an encoded signal that activates the tag.

In response the tag transponder initiates the conversion of radio signals into usable power along with responding to the reader.

Real-world applications of RFID

We understood how RFID works now let's see some of the real-world applications of RFID.

Agriculture

peerbits

Monitoring your cattle's health manually can be costly as well time consuming.

However, with RFID you can achieve this automatically and without much expenditure.

Jewelry tracking

RFID has successfully managed to mitigate the challenge of jewelry security.

With item-level tagging of jewelry with RFID, it's possible to track the jewelry right from the factory to the distribution center and ultimately to the store. Moreover, this process is both convenient and cost-effective.

Defense

RFID also has a key application in defense. It's used for weapon and soldier's movement tracking.

Moreover, it provides real-time information so it becomes easy to track down the location of a weapon.

In the case of emergencies, RFID enables you to easily access the real-time database when it's not possible to take help of other battalions.

Laundry automation

In large companies where they have a huge number of employee uniforms, RFID can be useful in laundry management system.

It can track the uniforms that were assigned to an employee, number of times it was washed, age of uniforms, and identifies the missing uniform.

Kiosks

RFID can also be used by the kiosks for managing resources or to interact with their customers.

DVD rental kiosks use RFID tags to ensure that the customer received their chosen movie rental.

Apart from that it's also used for interactive media display in which an RFID reader interrogates the cards or badges.

Library systems

RFID system in library helps in enhancing the efficiency of circulation operations. Libraries often use barcodes with proper positioning and line of sight.

peerbits

We saw some of the major real-world applications of RFID technology in various sector. But we must not forget its greatest application.

I am talking about application of RFID in supply chain management and logistics.

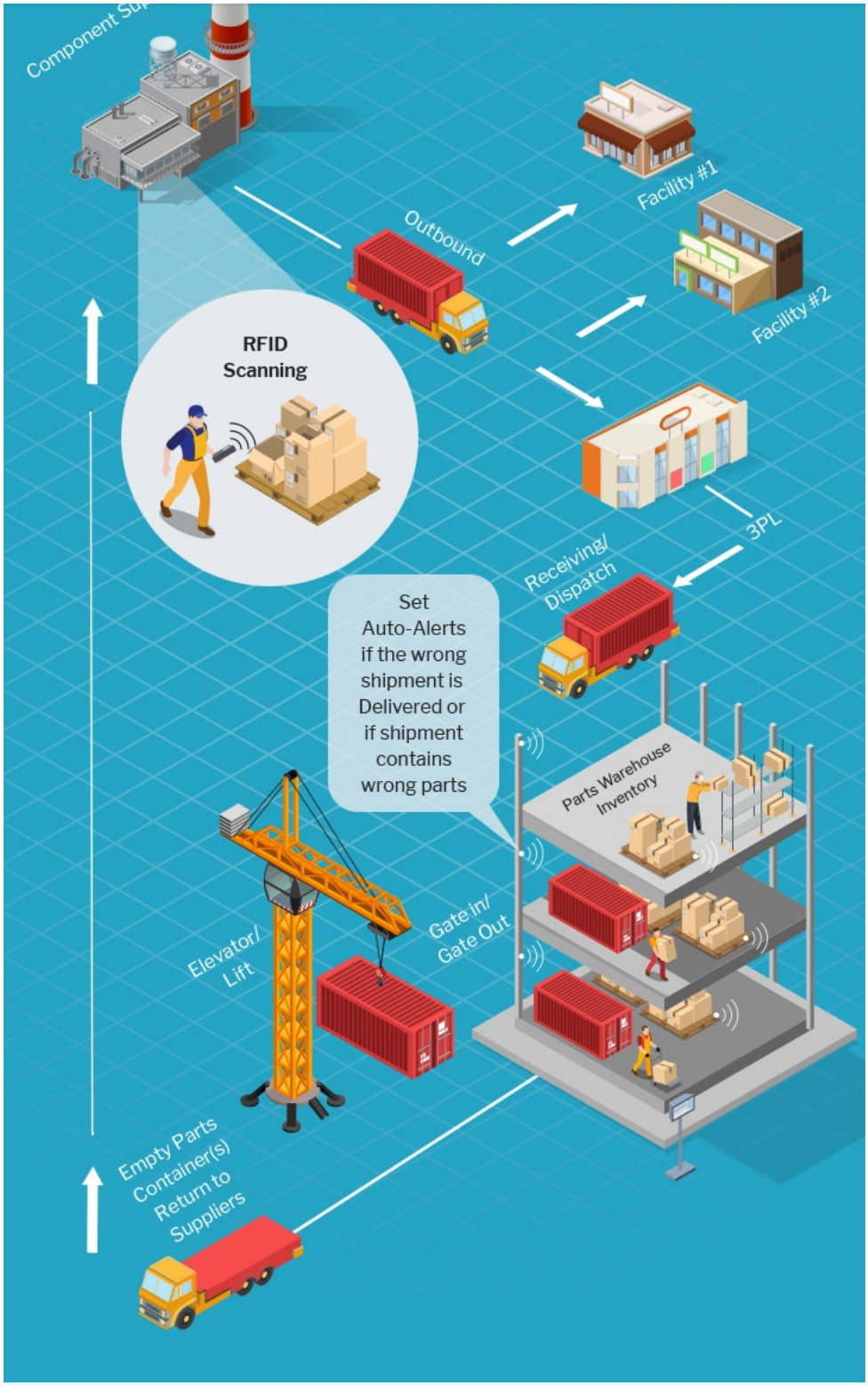
RFID in supply chain management and logistics

Supply chain management and logistics are considered as the most fertile field as far as the applications of RFID is concerned.

RFID in the supply chain plays a major role in enhancing the visibility right from the point of manufacturing, via supply chain, and most significantly from the back room to the floor, and ultimately to the exit door.

RFID has a major say when it comes to inventory management, warehouse management, and retail sector. Let's see in detail about them all.

peerbits



Inventory management

Inventory management is an important element of supply chain management. It includes various aspects like monitoring, administering, controlling, storing, and ultimately using the materials for the sale of a product.

Inaccuracy in inventory management is inevitable and is prevalent in many industries.

peerbits

RFID technology can provide numerous benefits to improve the inventory management system. RFID tags have the capability to read through an item.

Moreover, the person can scan several items at a time. These properties of RFID help to speed up the inventory management process and reduces human errors thus rendering a highly accurate inventory records.

> *Read More: A Smarter Step for Inventory Control Process*

Warehouse management

Warehouses are simply storage area where you store different products received from the suppliers. These products are then distributed to the customers.

Recently, RFID has emerged as a technology that supports warehouse management system for simpler supply chain and greater product intelligibility.

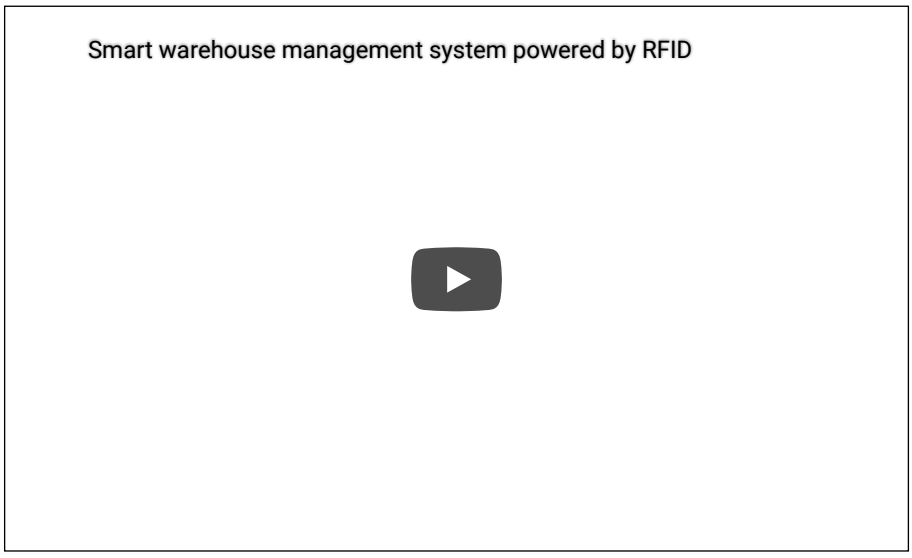
With RFID technology you can automate important tasks which take place during receiving and shipping processes.

RFID also increases efficiency of identification and validation activities along with reducing human errors.

RFID ensures identification of products at an instant and greater control over items in the warehouse.

Due to this the supply chains now have a greater information flow as compared to the material flow. This further reduces currency cost.

Peerbits have developed a solution for warehouse management system using RFID technology. Click on the below video to see how it works.



peerbits

RFID technology has already started to revolutionize the retail sector. Wal-Mart a behemoth in retail sector is experimenting with the passive RFID tags of passive types to meet high consumer demand.

RFID increases the product visibility in the retail inventory that helps in better inventory control and customer experience.

This is highly relevant in larger stores that have facility of customers searching for their chosen products online which the store has the current stock available for sale.

Secondly, RFID provides enhanced product identification by storing distinctive identification number.

And at last, it reduces the checkout times since RFID enables a shopper to scan entire content of a cart without even picking up a single item. Moreover, it helps in dynamic pricing, theft reduction, and employee tracking.

> *Read More: How can a Mobile App boost your Retail Store?*

Benefits of RFID

- Adds flexibility and intelligence in the process to improve service levels.
- Integrated automated receiving PCP in manufacturing enables you to continue without waiting for the receipt of the material.
- It enables to control the expiry date, automatic filling of missing files, inventory and returns control, and expediting checkout.
- Allows you to check shelves, boxes, and pallets on top without any eye contact.
- Reduces the total cycle time order until the goods delivery.
- Reduces the errors made in deliveries of customers' orders.
- Allows you to read multiple tags and hence increases the reading speed instead of processing one bar code at a time.
- Easy monitoring of all logistics operations along with increased security.
- Increased speed and agility in locating materials.
- Helps in avoiding tampering with recording of unique codes.
- Makes it easy to manage products and materials with less manpower.

Challenges in RFID implementation

RFID is a costly affair

RFID requires costly equipment whether it be a software or hardware.

Moreover, talking about the tags be it active, passive, or semi-passive are a costly affair and has the capability to set the business backwards.

peerbits

Trouble with metals & liquids

RFID doesn't go well with metals and liquids as they both make it difficult to obtain proper reads on assets. In metals the radio waves bounces all over the place.

Similarly, the liquid can absorb the signals from the RFID tags.

Difficult to understand the technology

It's difficult to understand about the different tags and frequencies. Managers need to understand the technology well so that they can train their employees about its working.

RFID collision course

Workers often come across reader and tag collisions. In reader collision, a worker faces the interferences from another reader in the field.

Similarly, in tag collision, the workers face reading an abundant amount of tags at a time. It occurs when more than one tag reflects a signal that confuses the reader.

Conclusion

In this article, we tried to provide an answer to most of key questions regarding RFID, it's implementation, application, benefits, and challenges.

RFID possess a vast potential and in coming years we will its applications in various industries.

If you're an entrepreneur and looking for a RFID integrated logistics app development then contact us.

As we are the forerunners in providing you with robust solution with minimum cost of app development.

Shahid Mansuri

co-founded Peerbits, one of the leading app development company USA, in 2011. His visionary leadership and flamboyant management style have yield fruitful results for the company. He believes in sharing his strong knowledge base with a leaned concentration on entrepreneurship and business.

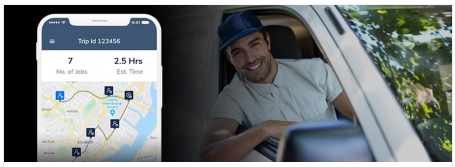
peerbits

Join fellow entrepreneurs! Get Peerbits' latest articles straight to your inbox.

Email

Subscribe

Related Posts



Logistics, Delivery

Significance of route planning in apps: Features, benefits, and applications

Logistics

A simple guide to developing an Uber-like app for trucks

Logistics

How mobility solutions are changing the dynamics of logistic & supply chain indus

Contact us for free app consultation

Full name *

Email *

Phone *

Skype/Google talk ID

Below $10K

I am interested in

Message *

peerbits

SEND NOW

Note: We'll provide a fully signed NDA for your Project's confidentiality

Delivering excellence, righteously

Company

- Partner With Us
- Blog
- Our Team
- Process
- Contact Us

Why Peerbits

- Portfolio
- Testimonials
- Our Differences
- Careers
- Resources

Services

- Mobile App
- Web Development
- Startups
- Enterprise Mobility
- UI/UX Design
- Hire developers

Have Questions?

Call us 24/7
+1 469 522-3385 (USA)
+919574078295 (India)

Career
+91 79 48000686 (HR)

Skype: enquiry.peerbits
Email: info@peerbits.com