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DEPARTMENT OF FOOD TECHNOLOGY

**COURSE CODE & NAME: 19FTT301 & Refrigeration & Cold Chain
Management**

III YEAR / V SEMESTER

UNIT : V - COLD CHAIN

TOPIC 4 : RFID & its application in Cold Chain



What is RFID?

- 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.



Real-world applications of RFID



Agriculture

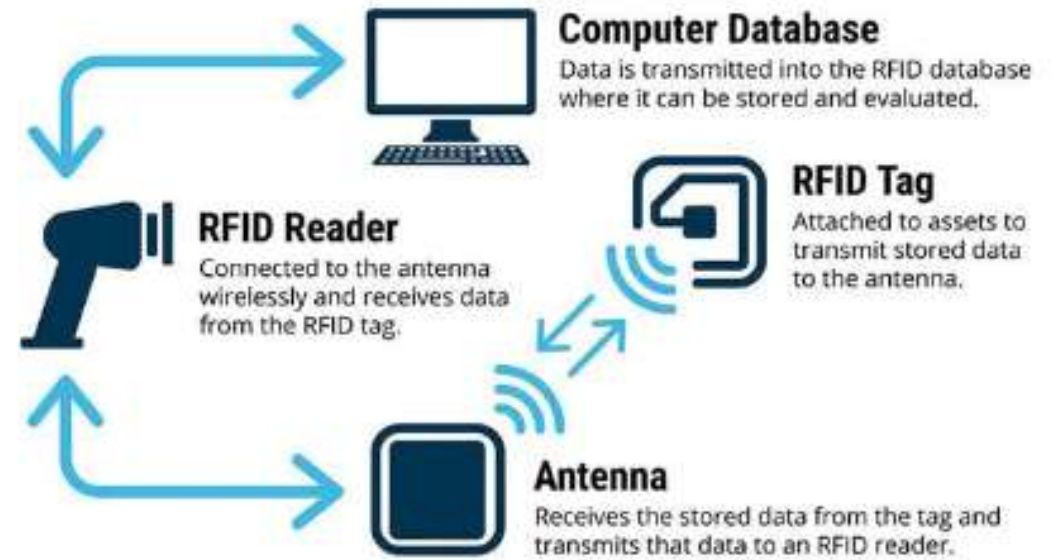
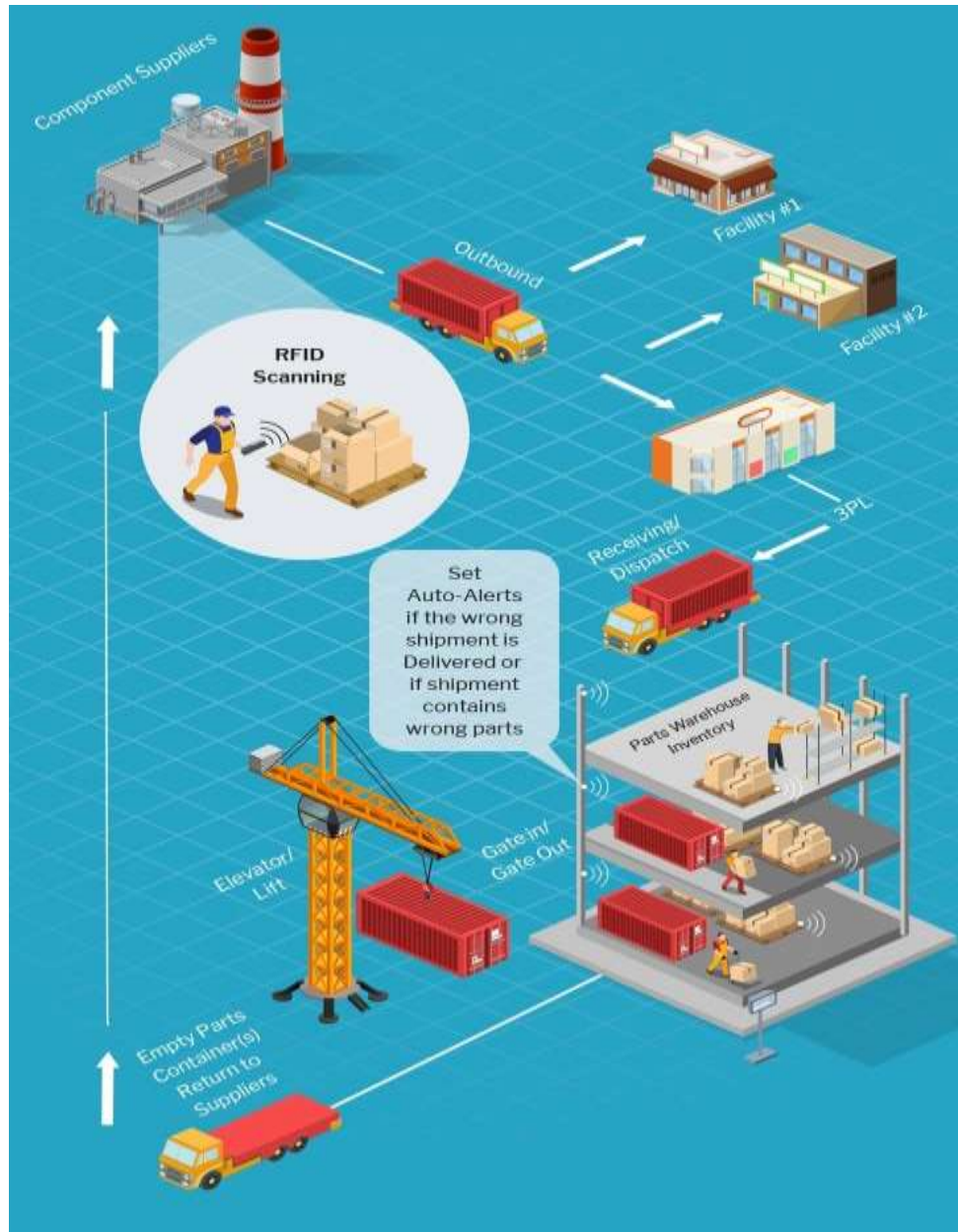
- RFID is useful to track the movement and health of animals in the farm.
- It ensures that each animal in the farm is taking the correct food.
- Monitoring your cattle's health manually can be costly as well time consuming.
- However, with RFID you can achieve this automatically and without much expenditure.



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.





Inventory management

1. 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.
2. Inaccuracy in inventory management is inevitable and is prevalent in many industries.
3. The inaccuracy is nothing but the mismatch between the inventory records and the actual amount of product available for the sale.
4. RFID technology can provide numerous benefits to improve the [inventory management system](#). RFID tags have the capability to read through an item.
5. 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.



Warehouse management

1. Warehouses are simply storage area where you store different products received from the suppliers. These products are then distributed to the customers.
2. Recently, RFID has emerged as a technology that supports [warehouse management system](#) for simpler supply chain and greater product intelligibility.
3. With RFID technology you can automate important tasks which take place during receiving and shipping processes.
4. RFID also increases efficiency of identification and validation activities along with reducing human errors.
5. RFID ensures identification of products at an instant and greater control over items in the warehouse.
6. Due to this the supply chains now have a greater information flow as compared to the material flow. This further reduces currency cost.
7. [Peerbits](#) have developed a solution for warehouse management system using RFID technology.



Retail sector

1. 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.
2. RFID increases the product visibility in the retail inventory that helps in [better inventory control](#) and customer experience.
3. 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.
4. Secondly, RFID provides enhanced product identification by storing distinctive identification number.
5. 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](#).



Benefits of RFID

1. Adds flexibility and intelligence in the process to improve service levels.
2. Integrated automated receiving PCP in manufacturing enables you to continue without waiting for the receipt of the material.
3. It enables to control the expiry date, automatic filling of missing files, inventory and returns control, and expediting checkout.
4. Allows you to check shelves, boxes, and pallets on top without any eye contact.
5. Reduces the total cycle time order until the goods delivery.
6. Reduces the errors made in deliveries of customers' orders.
7. Allows you to read multiple tags and hence increases the reading speed instead of processing one bar code at a time.
8. Easy monitoring of all [logistics operations along with increased security](#).
9. Increased speed and agility in locating materials.



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.

The rates of RFID tags have lowered since 1970s, but still many companies are reluctant to adopt it due to its steep prices.

- **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.



THANK YOU..."