

Warehouse Automation using RFID Technology

Introduction

Manufacturing industry produces products, moves the finish product to warehouse and based on the Dispatch Advice, dispatches the same to Customers/ Distributors/ Retailers. Based on the Dispatch Advice (Invoice / Delivery note /Pick list) products are loaded on the trucks which are meant for dispatches to Customers / Distributors / Retailers.

The common pain area in Warehouse Management is wrong identification of products during receipt / dispatches. Also the inventory of the items in the warehouse is a point of concern along with locating items in the warehouse. The contributing factors are Manual Errors, Dependency and reduced productivity. The result is that it reflects on organization's reputation and losses.

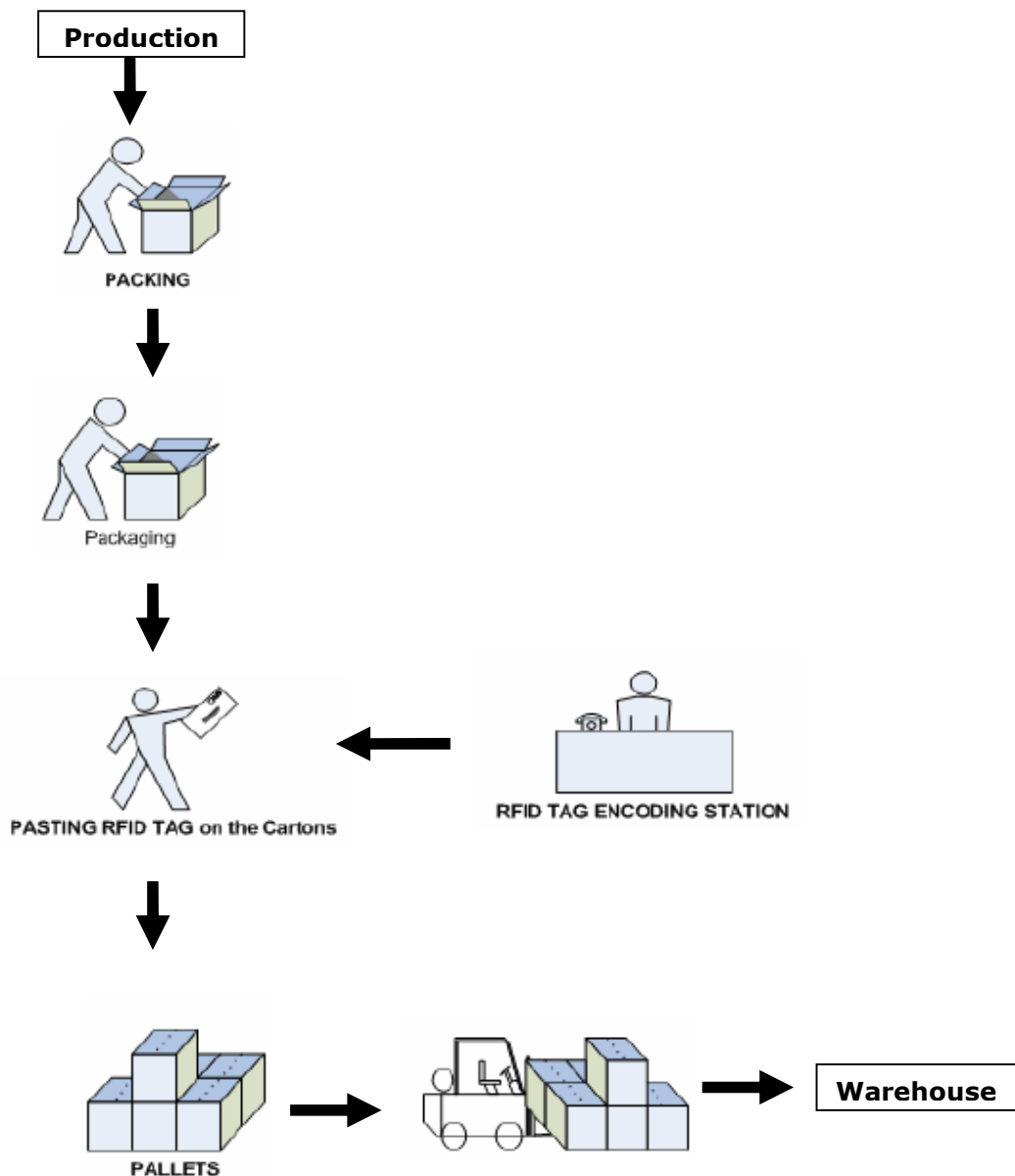


The proposed solution can definitely address and rectify the above mentioned pain areas.

Proposed System

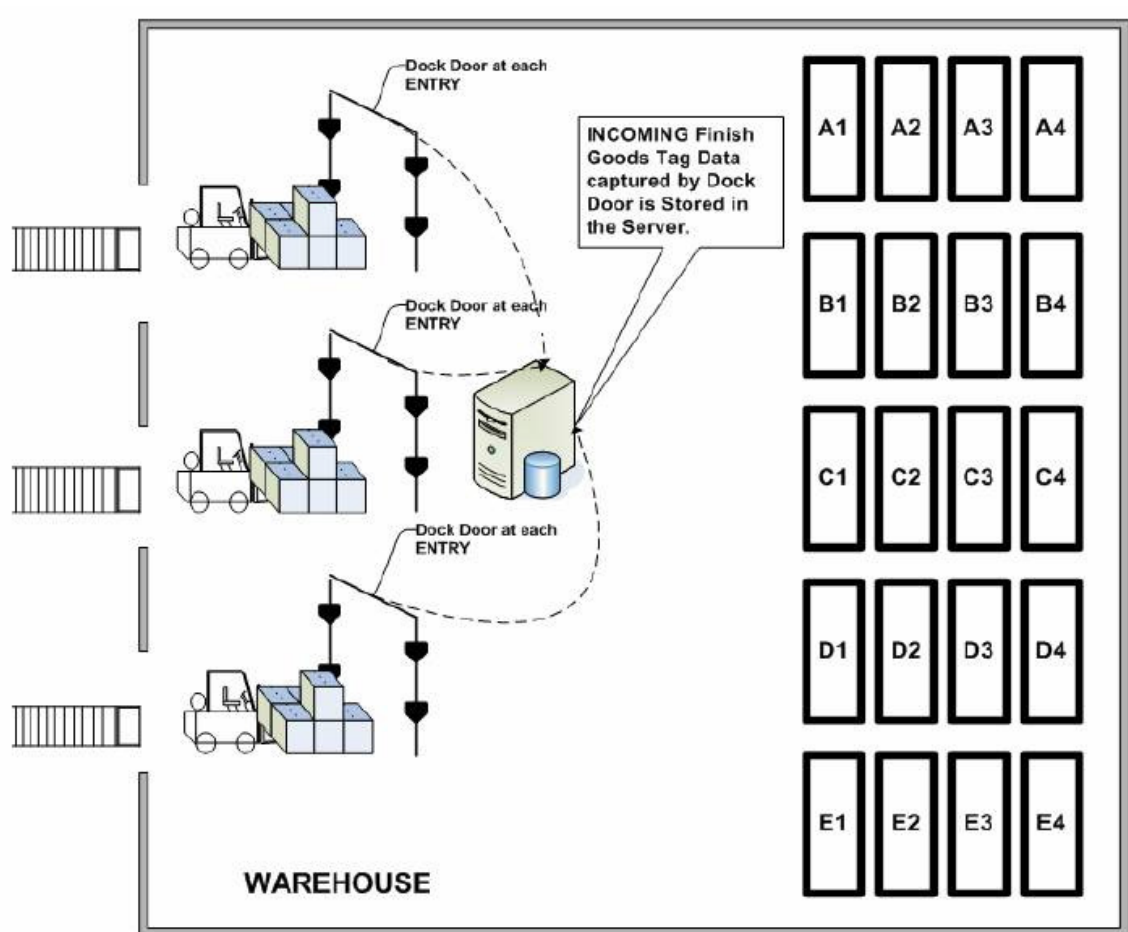
The proposed solution suggests pasting or hanging or stitching RFID tags / labels on every carton / box / sack as its identity. The packages are of standard pack size in terms of quantities that gives an advantage of accurate quantity. The processes proposed in this solution are as under.

Production Process: As soon as the packing of items in packages is done at the production department, RFID tag will be printed as well as encoded (writing data in the chip of RFID tag) with the item description, Date of production etc by a printer cum encoder machine. These packages will be moved to ware house.



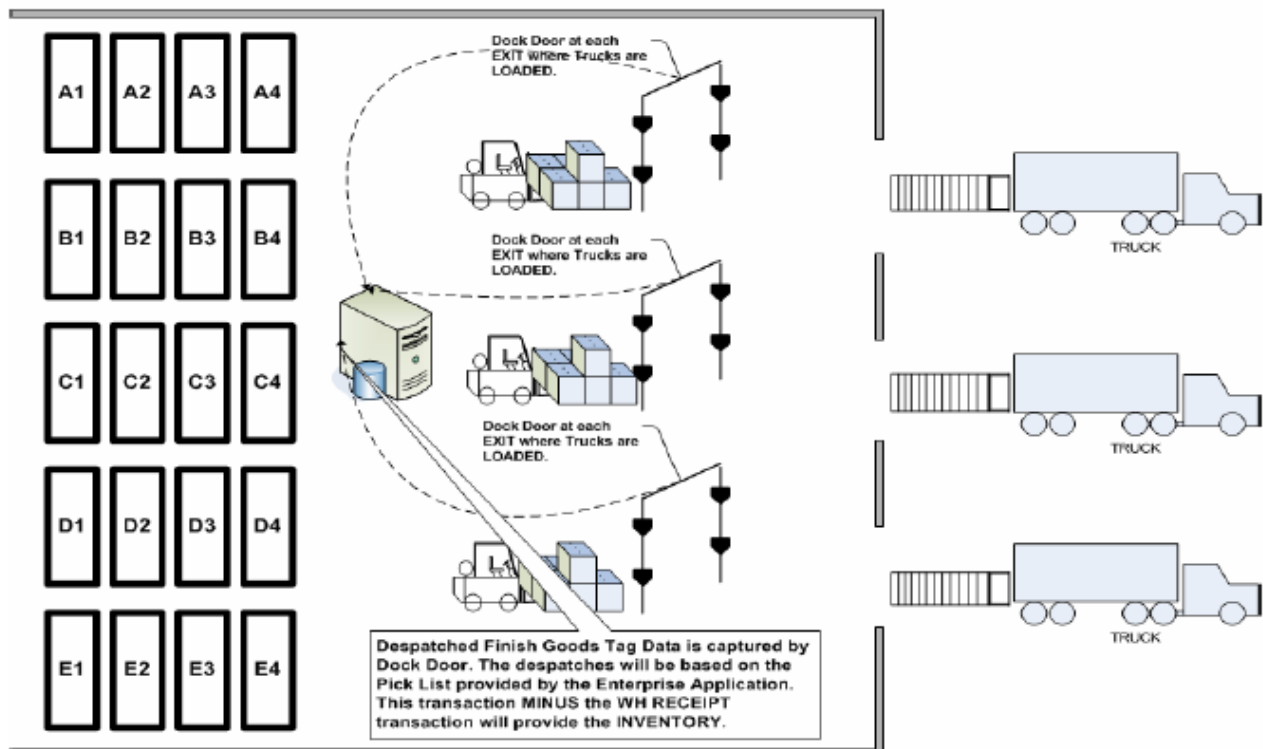
Warehouse Receipt

- The products arrive at the warehouse from Vendor / Production at the gate of the warehouse.
- It is proposed to have a Dock Door (made of Four Antennas with a Reader connected to the Computer / Server) at the warehouse gate.
- The cartons / boxes / sacks are unloaded on trolley / fork-lift at the unloading ramp.
- Then this trolley / fork-lift pass through the dock door to enter the warehouse.
- While the trolley / fork-lift is passing through the dock door, the Antennas & Reader will read all the RFID Tags pasted on the packages.
- This is achieved without any manual efforts and is done automatically while trolley / fork-lift is in motion.
- It means that 10-50-100 boxes (whatever is kept on the trolley) can be read within 1-2 seconds.
- The captured data is immediately passed on the computer / server instantly. The process of receiving is fulfilled.
- At this speed a complete truck load can be received by the system within the time of physical unloading.
- Even at this speed, accuracy is assured.







Warehouse Dispatch / Delivery

- Delivery note / Invoice / Pick list generated from the enterprise software based on the customer order
- Based on this, items will be picked from the storage locations
- Dock door with RFID readers / antenna will be installed at the gate
- While the items are moved through the gate, all packages are automatically identified by the RFID readers
- Read items will be verified with the generated Delivery Note / Invoice / Pick list
- Quantities of the items are also checked and an alert in the form of Audio or Visual alarm can be generated for any mismatches



Suggested Items

Item	Image	Description	Application
STA L10150 UHF Smart label		Dimensions: 101.6×50.8mm (4×2in) Base material: PET; aluminum Case material: Paper Operating frequency: 860-960MHz Supported standard: EPCglobal Class 1 Gen 2; ISO 18000-6C Read distance: Up to 7m / 23ft (Reader dependent) Chip type: UCODE G2XL, Memory: 240-bit EPC; 64-bit TID; 32-bit access password; 32-bit kill password Functionality: Read/Write	For pasting on each carton box
STA IR0507 Desktop reader		UHF middle-distance integrative reader Frequency: 860MHz-868MHz(CE) Protocol : ISO18000-6B EPC G2 Reading Range: 5 m Power Consumed: DC+9V/12V	Tag programming before pasting on carton
STA 4R1207 reader with STA AN07C7 antenna 4 nos		UHF 4-antennas reader Frequency: 860MHz-868MHz(CE) Protocol : ISO18000-6B EPC G2 Interface : TCP/IP, RS232 Antenna: One~Four Antenna /SMA Reading Range: 12 m Power Consumed: DC+9V/12V	Gate reader for automatic reading of passing items
STA PT0707 Portable reader		UHF handheld reader with PDA Frequency: 860MHz-868MHz(CE) Protocol : ISO18000-6B EPC G2 Reading Range: 7M Read Rate: 150 tags per second Connectivity: Wi Fi (802.11 b/g), USB, RS232 Processor : Samsung, 400 MHz Memory: 128 MByte Flash, 64 MByte RAM	Portable reading
Stallion Warehouse Management Software Package		Features as per the attached document	WMS Software