RFID based Warehouse Management System

WHITE PAPER

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Warehouse is a critical hub in business. In the supply chain, it is always at the joint of the processes, like between purchasing & manufacturing, between manufacturing & selling, between wholesale & retailing and among the switch of transportations.

Warehouse operation like Planning and control of warehouse facilities and systems has become more complex in supply chain. Warehousing is often needed to perform routine logistics operations such as Stock Storage, Order status, paper processes, Sorting, Cycle counts, Loading/unloading and customer service. Poor utilization of costly warehouse space, Manual errors, wrong identification of the product during receipt & dispatch, locating items in warehouse will impact the productivity & profitability which results in organization's reputation & losses.

RFID is an excellent real-time business tool that helps better manage supply chains, covers goods entry, picking, checking, delivery and many other operation flows & increases profit, and decreases the cost by improving visibility into Warehouse management system. The Warehouse Management System based on RFID will help to improve the efficiency of warehouse management, and make rapid self-recording of receiving and delivery.

### Negative Business Impact of the Warehouse

- **Manual Errors:** manually-driven procedures in the warehouse cause a number of higher level operational issues in the warehouse (like Inventory may show in stock when in actuality there is an out-of-stock condition, and vice versa.)
- **Wrong identification of the items:** Labels on shipments may be damaged or illegible, causing a long delay in processing, and resulting in congestion at the receiving dock or wrong dispatch/receipt.
- **Poor utilization of costly warehouse space.**
- **Poor inventory visibility and accuracy** which results into erroneous out-of-stock conditions and lost sales.
- **Manual Product counts results into higher labor costs.**
- **Locating the items:** improper sorting, which results in the misplacement of materials on the warehouse shelves & also time consuming.
- **Reduced Customer Satisfaction:** Mis-ships and other shipment delays that ultimately impact customer service satisfaction and retention.

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*RFID Illuminates Lithuanian Lamp Manufacturer*

“Artilux NMF is one of the first companies in the nation to track finished products and raw materials throughout warehouse and production areas.”

--RFID Journal, Feb 24, 2010

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Customer’s consignment order is input into Supplier’s system, bringing all items to their Maximum level. In the Supplier's warehouse, the order is picked, the items are loaded into a pallet and **RFID labels are printed** (with Item Description, Date of production etc) and **applied to the items**. Packed items pass through Supplier’s exit portal and are shipped to the Warehouse.

**Figure1: Supplier Department Process**
The products arrive at the warehouse from the Suppliers warehouse. At the Dock door is mounted with the reader with antenna. Goods (pallets) from the truck are unloaded in the forklift & while forklift passes through the dock door of the warehouse, antenna & reader reads the RFID tag pasted on the all the pallets. The captured data is passed to the server immediately. This is how the truck loaded with goods can be received in the warehouse. By correlating the item with the location, item stacking can be achieved in the warehouse.

Figure 2: Warehouse Receipt
While dispatching the goods, items are put in a forklift from various locations of the goods. When the forklift passes through the exiting dock door, the reader attached at the door reads the tag on the pallets & sends it to the server. Server the compares the received data with the data stored at the time of receipt of goods & if the match is found, system records as goods are dispatched. If the item quantity is not matched, wrong item is dispatching or excess item is dispatching, alert is given at the exiting dock door when the forklift passes through it.

If the location of the item is unknown or item is misplaced, handheld reader can be used to identify the location in the Warehouse. By loading the data like item no, location etc in the handheld reader & passing the handheld reader over the item, location of the item can be identified.

**Figure 3: Warehouse Dispatch**
Benefits of RFID in Warehouse Management:

- Smoother-running business environments—knowing precisely what and where inventory is, thus reducing stock-outs due to a more accurate real-time picture of warehouse is available at facilities.
- Reduced labor costs by reducing the workforce needed for tracking and warehouse management.
- Reduction in order entry errors (less manual intervention) & improved employee productivity.
- Reduces stocking inventory levels and related warehouse space requirements.
- Provides the information required to implement first-in first-out (FIFO) or last-in first out (LIFO) inventory management, which can have a significant positive impact on the company’s profitability analysis and tax liabilities.
- Instant access to the order database provides the on-the-spot visibility needed to cross dock the incoming material for immediate shipping to fulfill customer orders.
- Access to real-time information ensures that the right shipment is delivered to the right dock and loaded onto the right truck.
- Advanced data capture capabilities, such as imaging, can provide proof of condition for returns records, eliminating potential customer disputes.
- A quick scan of a RFID tag provides instant verification that the right item has been picked, and the item is instantly deducted from inventory.
What IAITO can Provide

Why you should select IAITO Infotech as your partner

- We understand the RFID Technology, Solution and have knowledge of the Industry with the top Notch IIT Kanpur R&D engineers who are having more than 5+ years experience in the same domain.
- Our understanding about the RFID Business Values & ROI Realization is with 15+ years experience business people in team.
- We provide High Quality Product & Testing process *(ISO 9001: 2008 Certified Company)*.
- We Have High Techno Commercial viability – ROI.
- Indigenous Setup (Design, Developed & Tested in world class RFID lab of IIT Kanpur).
- We have Local Support & Strong Partner Network Framework to ensure better support.
Conclusion:

The warehouse management system (WMS) based on RFID can collect, transfer, check, and update mass data on daily frequent goods entry and delivery, thus the labor intensity will be decreased, errors like fault scanning, miss scanning, re-scanning in the repeating manual operations can also be avoided. It improves the efficiency and accuracy. With development of the RFID technology, reduction of costs, gradual unification of the standards, decrease of the error rate, the effective combination of WMS and RFID will become one of the key factors to improve the competitive power of enterprises and the efficiency of the supply chain.

About IAITO INFOTECH PVT LTD (ISO 9001:2008 certified) an incubate company of IIT Kanpur provides state of the art integrated traceability, identification and authentication solution. It provides software as well as integrated turnkey solution of both(hardware, software & services) in various technologies like RFID, NFC, GPS, Mobile technologies etc.

With the knowledge of experienced professional, we are able to help you to deploy right combination of technology that will maximize your ROI right from start and ensure its expandability as the application grow through the evolution of the technology.

With our R & D experienced team, we have developed different integrated solutions for various industries and carry one of the most comprehensive product/solutions.

IAITO’s turnkey solutions model covers industries like Aviation, Manufacturing, Transportation, Retail, Government, Renewable Energy, BFSI and Mining.

For more Information kindly visit our website [http://www.iaito.co.in/](http://www.iaito.co.in/)

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