CASE STUDY
SMRT CORPORATION LTD
SINGAPORE

SMRT IMPLEMENTS MOTOROLA RFID TO IMPROVE PROCESSES AND INTRODUCE COST-SAVINGS

SMRT Corporation Ltd implemented the Motorola RFID (Radio Frequency Identification) system to cater to its warehousing management needs and sharpen its competitive edge.

As Singapore's leading multi-modal public transport service provider, SMRT offers an extensive network of trains, buses and taxis supported by retail hubs located within its stations.

With an annual turnover of nearly $895.1 million and total assets worth more than S$1.5 billion, SMRT constantly strives to ensure an efficiently-run and profitable business that meets all regulatory requirements by seeking new ways to improve both its top-line and bottom-line. The implementation of the SMRT Radio Frequency Identification (RFID) Warehouse Management System has helped to trim its bottom-line.

CUSTOMER PROFILE

Company
- SMRT Corporation Ltd (SMRT)

Industry
- Transportation

Partner
- TCM RFiD Pte Ltd

Key Benefits
- Reduction in stock-take cycle from 384 to 48 hours
- Below 0.005% data entry error rate
- Minimised recurring problem of stock reconciliation
- Estimated annual savings of 4,160 man hours

Used to track equipment and spare parts, the initial roll-out was to SMRT's two warehouses located at the Changi and Ulu Pandan depots which house 2,000 line items for the train operations. The subsequent plan is to implement the RFID-based warehouse management system to seven other warehouses that cater to SMRT's bus and taxi operations.

"The implementation of RFID system at SMRT was the result of our continuous efforts to further improve business processes, enhance productivity, and introduce cost-savings."

Mr Jason Chin
Director of Information Technology, SMRT

It is no mean feat to manage nine warehouses and workshops filled with over 80,000 items. This entails ensuring that they are sufficiently stocked to handle all maintenance demands, managing the shelf-life of the stocks and making timely deliveries to different vehicle workshops across Singapore.

In contrast, SMRT's previous paper-based system of manual data entry was a laborious process that was prone to human error. Not only was it time-consuming to locate the right item, but also challenging to implement the just-in-time concept due to a time-lag in getting updated information.

THE SEARCH FOR A REAL-TIME DIFFERENTIATOR

SMRT approached the challenge first by carrying out a business process review, where the IT department sat down with key business users to study the existing processes. The review found that users were spending too much time on paperwork and locating the right items, with many steps that could be eliminated through automation.

Said Chin: "Post-review, all parties involved in the project had a clear understanding of their requirements and how the proposed solution will address the

identified requirements. This gave the IT team the all-important buy-in from users."

SMRT decided to work with TCM RFiD Pte Ltd, a premier partner of Motorola who specializes in real-time tracking solutions and RFID consultancy. TCM's award winning Intelli-RFID Inventory Tracking System (i-RITS) was chosen as the platform for SMRT RFID-based warehouse management system.

i-RITS is an on-demand, web-based inventory control & management solution that provides real-time information on the quantity, location, status, and history of every inventory item within the warehouse at any time. It ensures essential flow of up-to-the-minute information and ability to easily see, direct, and manage the movement of inventory across multiple warehouse sites, facilities, or locations.

i-RITS also bridges the gaps where traditional ERP and WMS system are unable to address in business operation. From preparation of incoming goods, to picking/packing, and finally shipping to customers, i-RITS reduces time-consuming paper tracking and also human errors by enabling Real-Time data access at anytime and anywhere as it runs on a web-enabled platform and in a wireless environment for the users.

i-RITS is developed on an open platform, making system and data integration more resilient to any kind of application. i-RITS works with various RFID tags (LF, HF, UHF EPC Gen2, etc), Barcode standards (Linear, 2D, Color etc) and comes with default support for Motorola RFID equipment.

A total of 80,000 tags, four Motorola ruggedised handheld RFID MC9000 scanners, two Motorola MK500 Micro Kiosk touch-screen desktop RFID readers, and three Motorola XR450 RFID Electronic Article Surveillance (EAS) readers were implemented for the two warehouses. The information is transmitted via wireless local area network on a real-time basis to the backend SAP R/3 system and RFID-enabled Warehouse Management System.

The system is deployed on the ultra-high frequency (UHF) platform and uses EPC Class 1 Gen 2 passive tags at a frequency range of 920 to 925mHz. All equipment used for the system conforms to EPC Gen 2 global standards.

The RFID-enabled Warehouse Management System allows efficient tracking, management of equipment and spare parts through the use of RFID tags. Working in conjunction with the RFID equipment, the system creates a fully-automated environment that enables self-service 24/7. End users are able to draw spare parts anytime of the day, 365 days a year, without having to go through tedious paper process and trouble the store officer. This has enabled faster turnaround times for repairs and maintenance.

All store items are tagged with RFID tags and associated with unique reference numbers. This allows each piece of equipment and spare part to be identified and tracked when it flows from the warehouse to end users when the items are issued, and subsequently back to the warehouse when the items are returned. The status of its movement is tracked real-time with the RFID-enabled Warehouse Management System.

STRATEGIC IMPACT

SMRT's journey to embark on RFID technology enabled its business practices to be innovatively transformed, driving greater business value for the organisation. Such innovations have brought about increased efficiency in turnaround times for repair and maintenance. The Track and Trace function ensures that the right items are kept in the right location, and has substantially reduced efforts spent on locating misplaced items.

"Using RFID technology at the item-level has provided a well-stocked inventory, boosted productivity, and saved SMRT time and money."

Mr Richard Yeo
Director of Central Supplies, SMRT

With the RFID solution, there is now automated data entry and data capture, resulting in a 800% reduction in stock-take cycle time, from 384 hours to 48 hours. Data integrity is vastly improved, with a below 0.005% data entry error rate.

The use of RFID labelling has eased the recurring problem of stock reconciliation. There is enhanced stock accuracy as miscounting due to human error is reduced. Stock discrepancy arising from possible pilferage and unintentional removal of stock items can be mitigated as an alarm system will be triggered when a stock item is taken out without authorisation. Items that are past shelf-life or are near the end-of-shelf-life can be identified and removed from inventory.

There is increased accountability as every movement of the stock item is tracked and tied to the person(s) performing the transaction, e.g. receipt of goods, picking, issuing, etc. The system is able to monitor activities and transactions that take place in the store, keeping an audit trail of these movements.

An estimated annual cost saving of $80,000 is expected from the reduction of labour and improvement in productivity and an estimated annual savings of 4,160 man hours from reduced handling, for the initial roll-out of the system in two of SMRT's warehouses. Tracking the massive number of items has been aided by the Motorola XR450 RFID EAS readers that are ideal for such large-scale RFID deployments. This industrial-class RFID reader delivers reliable and efficient tag reading in dense RF environments, eliminating interference issues associated with multiple RFID readers in close proximity.

With the solution in place, SMRT can implement a secured fully-automated warehouse to facilitate self-service retrieval of items 24/7, without the need for the presence of a store officer. This self-service feature is enabled by the compact Motorola MK500 Micro Kiosk, so that users can check inventory, determine the location of the spare or call for assistance – all with only a scan of a bar code or touch of a button/screen. Non-intrusive, it does not require precious warehouse floor real estate as the highly compact device fits in easily in the environment.

Time spent on physical inventory count by technical officers is also greatly reduced. Instead of having to scan one item at a time, the Motorola MC9000 Handheld RFID scanners can be used to glide over an area comprising RFID-tagged stock items. The stock count for that area is instantaneously updated in the warehouse management system, as well as the SAP Materials Management system. The handheld's rugged construction can withstand rigorous use, as it has passed the industry's stringent drop and tumble tests to gain a rating of IP64. With its 3.8" display with exceptional clarity and contrast, it the handheld provides clear readings.

The reduced use of paper is also aligned with the organisation's efforts to be more environmentally-friendly. With the automation and simplification of manual processes, SMRT is no longer reliant on paper documents to keep track of stock movement in and out of the store. The RFID solution based on i-RITS ensures that records are accurately updated.

In the future, the remaining seven warehouses will be enabled by the new technology to track an estimated total of another 64,000 line items. The estimated net savings from the future implementation will yield about $1.3 million annually. The roll-out will be spread over the next three to four years. Other plans include involving SMRT's regular suppliers in pre-tagging their stock items with RFID transponders before delivery. This will allow SMRT to achieve a truly integrated RFID-based supply chain and a greater widespread use of RFID.

MC9000

MK500

XR450

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