Garment manufacturer opts for RFID-enabled
YARN FABRIC TRACKING SYSTEM

Automated process tracking of work-in-progress
Integration with individual barcode data of each item of raw material and work-in-progress
Easy incorporation of Quality Control data
Trolley utilization optimized through automated monitoring

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CASE STUDY

KEY REQUIREMENTS:
Ocean India is a garment manufacturer involved in large scale production of knitted fabric and caters to the needs of various international brands. The production sequence of fabric in the manufacturing unit consists of various processing steps. These processes proceed from one step to another through a trolley system. In managing this sequence, any step missed or performed incorrectly in any of the processes impacts the quality of fabric produced and leads to consequent rejection. Hence to manage these processes efficiently and minimize loss, the company required a solution that kept track of each trolley and its current status in the production sequence.

The company uses bar codes to maintain information on raw material at each stage of manufacture. This work-in-progress raw material is carried along on trolleys at each of these stages. RFID tagging is required on these trolleys in order that the individual bar-coded information can be utilized to monitor the movement of work-in-progress at each subsequent stage of production in a seamless, automated manner till it becomes a finished product.

Main challenges in implementation:
• Tracking each trolley during the entire production sequence.
• Bar code data from raw material work-in-progress to be associated with RFID tagged trolleys at every stage of production.
• Alerting supervisors if any process was missed by any of these trolleys.

SOLUTION:
Essen RFID offered a Yarn Fabric Tracking System as a solution based on RFID technology. It involved the tracking of trolleys containing raw material in various stages of production through RFID tags in order to maintain up-to-date status information throughout the entire production process.

IMPLEMENTATION:
A µMETALLICA™ tag is affixed to each trolley. These tags are also used as location tags at various process stages and on the shelves at the final storage stage. PERSONNA™ ID tags are issued to each employee involved in Quality Control. HandyScanna™ hand-held devices are used to track each trolley as it passes through the different processes. The tracking system is integrated with multiple modules that are part of the fabric manufacturing process. SQL Server is used as the back-end database, while the HandyScanna™ employs Essen RFID’s mobile based application and updates the server through Wi-Fi connectivity.
CASE STUDY

WORKING:

The Yarn Fabric Tracking System keeps track of each process, as the goods move from raw material to finished product. The process flow is as follows:

1. A µMETALLICA™ tag is affixed to each trolley. Xtenna Proximity™ reads the unique ID of each of these tags and registers the trolleys into the database. Each trolley can now be individually identified based on its tag.

2. PERSONNA™ ID tags are issued to each employee and registered into the database using Xtenna Proximity™ along with relevant employee details.

3. The yarn is spooled into cones which are packed into boxes containing 100 cones each. Each of these boxes has a barcode affixed on them containing information about material details of that particular yarn. These boxes are then placed on the trolleys. The RFID tag of each trolley is associated in the database with the barcode IDs of the boxes placed on it.

4. The trolleys containing boxes of yarn cones move towards the knitting machine, where they are detected by the operator using a HandyScanna™ hand-held device. The HandyScanna™ reads the trolley tag and instantly makes available to the operator the quantitative and material details of all the yarn cones in each box on the trolley. The yarn is then unspooled on the knitting machine from each cone and knitted into fabric. After knitting, the yarn gets converted into rolls of fabric.

5. The empty cones are now de-associated in the database from the trolleys.

6. A barcode is assigned to each roll of fabric, containing information about the material details of that particular roll.

7. The bar-coded fabric rolls are now placed back in the trolleys. The barcode ID of each roll is now associated with the RFID tag of the trolley in which it has been placed. RFID uses the data of the existing barcode system to collect its data and associate the tag. The back-end system is updated that the knitting process has been completed.

8. In this manner, the trolley contents undergo a sequential process that is followed as they move towards becoming the finished fabric. These processes include knitting, dyeing, etc. Using HandyScanna™ each trolley is detected and the status of its contents is updated as it moves along each of these steps of the production sequence.

9. After each process, a Quality Check is undertaken. The QC operator checks each trolley and marks it as OK or NG (not good). The trolleys marked ‘NG’ are rejected and the ones marked ‘OK’ move to the next step of production. Rejected material is updated using its barcode ID.

10. At each step (including QC), the operator handling that particular process first scans his own PERSONNA™ ID tag with the HandyScanna™ device before scanning the trolley. This ensures that accountability is maintained throughout the entire production sequence.
11. At the dyeing process, the barcode label on each roll is removed and the identification number is manually written on each roll using fabric ink. The operator reads the trolley tag with the HandyScanna™ device and through its software application updates this removal information into the system accordingly. The fabric rolls go for dyeing and the tags on the empty trolleys are de-associated from the rolls in the database.

12. After the dyeing is completed, the operator reassigns a barcode to each dyed fabric roll using the identification number manually written with fabric ink on each roll.

13. The dyed rolls are now placed back in the trolleys and their barcodes are associated with the RFID tags of the trolley in which they have been placed. Each trolley is now sent to Quality Control. The RFID system updates data using input data from the barcode system.

14. When the final process is completed, the finished product i.e. fabric roll is kept in storage in an area within the premises. The fabrics are stored on shelves according to their type and variety, until they are sent for dispatch. The empty trolleys are then de-associated in the database from the fabric rolls that they contained earlier.

15. Since each shelf in storage has also been affixed with a µMETALLICA™ tag, its location is known to the database. When fabric rolls arrive for storage, their barcode IDs are associated with their respective shelf RFID tags in the database. In this way, the whereabouts of each fabric roll become known to the system.
CASE STUDY

BENEFITS:

• Complete monitoring of trolley utilization throughout manufacturing process.
• Time saved due to automated trolley checking at each stage of manufacture.
• Easy integration with existing barcode system.
• Cost savings as qualitative and quantitative information is available at each stage of manufacture.
• Efficient tracking of process status and systematic yarn/fabric utilization.
• Rejected trolleys easily calculated during Quality Control.
• Improvements can be made based on easily available data regarding the rejection rate for various processes.
• Easy identification of theft or misplacement, along with alerts.
• Reduction in manual work and paperwork due to automated supervision and reports.

LINKS:

Hardware:

![Handy Scanna](#)

![Xtenna Proximity™](#)

Tags:

![µMETALLICA™](#)

![PERSONNA™](#)

Software:

![Xtenna WebToolkit™](#)

![Xtenna Studio™](#)

Reference Example: