

CASE STUDY

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Silk saree manufacturer pilot module for RFID-enabled SAREE TRACKING SYSTEM

Automated tracking through each process of production

Optimized monitoring of all manufacturing processes

Separate information per 'thaan' of material utilized by
vendors and returned by them

Real-time stock data for 'thaan' as well as sarees



INSIDE:

Key Requirements
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Links

TECHNOLOGY

Solution:

EPC Gen2 compliant
inventory tracking solution

Tag Type:

Solanna™ UHF Passive

Reader/Antenna:

Xtenna Proximity™

Method:

Multiple Tracking via Integrated
Reader/Antenna modules

Integration Platform:

RFID Middleware:

Xtenna™ WebToolkit

Xtenna™ Studio

Application: Essen RFID's

Saree Tracking System

Database: SQL Server 2005 Exp. ed.

ERP: Oracle

Tag Manufacturer/Supplier:

Essen RFID, with US based chip inlay

Reader/Antenna Manufacturer:

Essen RFID, with US based module

Systems Integrator:

Essen RFID

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KEY REQUIREMENTS:

Ghanshyam Silks is a saree manufacturer in Varanasi, Uttar Pradesh, that specializes in Banarasi Silk sarees. Banaras silk sarees have a world-wide reputation for fine quality and excellence in production, resulting in their lasting popularity and high demand.

These sarees are premium products that incur high production costs and are expensive to purchase. The company therefore needs to constantly maintain a high standard of quality and ensure that the production process is perfectly followed. Any process missed during the manufacture of a saree will result in that particular saree getting rejected. The sarees are manufactured from long silk fabric known as 'thaan'. The company required a central system that kept track of the entire manufacturing process and also maintained details of final saree production.

Main challenges:

- Keeping track of 'thaan' supplied to each vendor and quantity returned.
- Keeping track of the saree manufacturing process of any particular 'thaan'.
- Tracking the availability of sarees in production.
- Keeping track of the respective saree count of each 'thaan'.

SOLUTION:

Essen RFID offered a saree tracking system based on RFID technology to track the sarees during the production process. It involved tagging each 'thaan' and saree with specialized RFID tags which are tracked during the manufacturing process using Essen RFID's Xtenna Proximity™ integrated antenna-reader.

IMPLEMENTATION:

A SOLANNA™ RFID tag is attached to each 'thaan' and to each saree. The tags are registered into the database with a Xtenna Proximity™ antenna-reader at the registration area. More Xtenna Proximity™ devices are also mounted at various locations in the manufacturing area in order to track the tags at each stage of the manufacturing process.

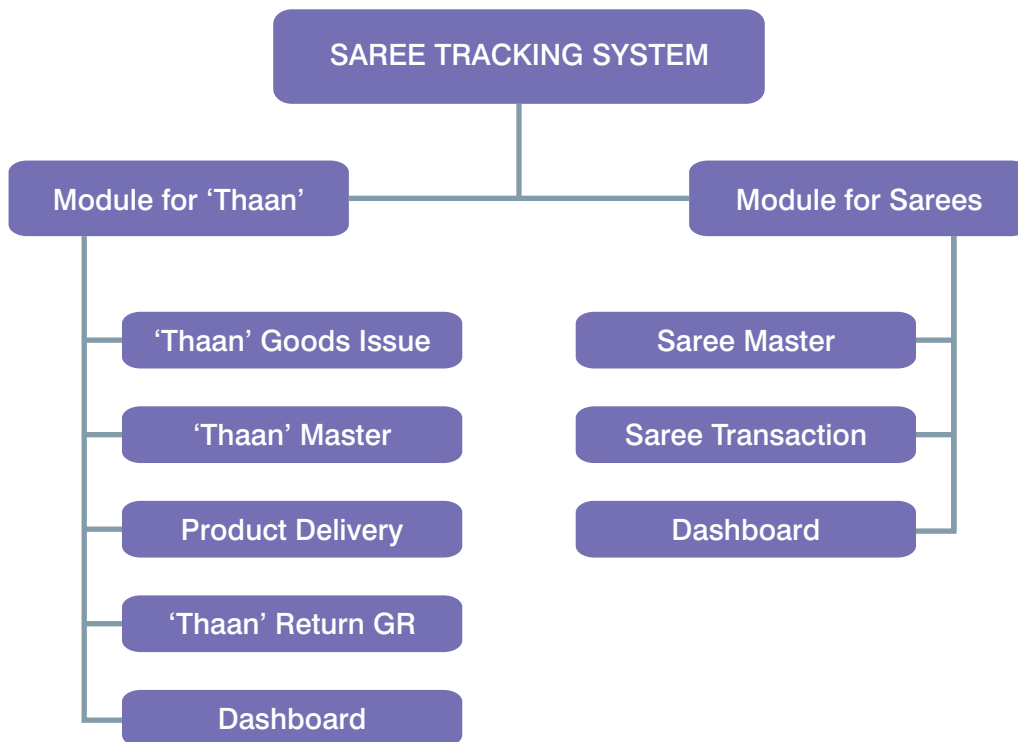
The Saree Tracking System uses .NET technology for its application, while SQL Server is deployed as the back-end database for storing all details of each 'thaan' and saree throughout production and as finished goods.

WORKING:

Since the company required tracking information for both 'thaan' as well as sarees, the tracking system was divided into two modules: 'Thaan' Module and Saree Module.



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Process Flow for Saree Tracking:

Location and Process Mapping:

RFID is utilized to track processes such as Weaving, Dyeing, Drying, Ironing, etc. Each of these locations in the manufacturing area has a Xtenna Proximity™ fitted which will read the tags on each fabric as it arrives at that location. The location details of each Xtenna Proximity™ antenna-reader are stored in the Location Master. The Process Master contains the list of processes that are to be followed in order to produce the finished saree. The Location and Process

Saree Tracking System 1.0.0.0



Version:1.0.0.0
User:admin

Saree Tracking System

Actions

- Masters
 - Location Master
 - Saree Master
 - Process Master
 - Category Master
 - Thaan Master
 - Vendor Master
- User Management
 - User Master
 - Role Master
- Utilities
 - Saree Transaction
 - Thaan Goods Issue
 - Product Delivery
 - Thaan Return GR
- Dashboard
- Mapping Modules
 - Location and Process Mapping
 - DashboardVendor

Location and Process Mapping Details in grid view.

MapId	LOCATION_DEVICE_IP	processName
2	192.168.123.10-11	Dyeing
1	192.168.123.10-22	Weaving
3	192.168.123.148-11	Dyeing

Data Entry Form.

Process Name

Dyeing

Location Name

192.168.123.148-11

System ID

OK

Cancel

Location and Process Mapping

Dash Board

Thaan Goods Return

Product Delivery Details

Sari Transaction


Category Master

Thaan Master

Saree Master

Application Log

Log



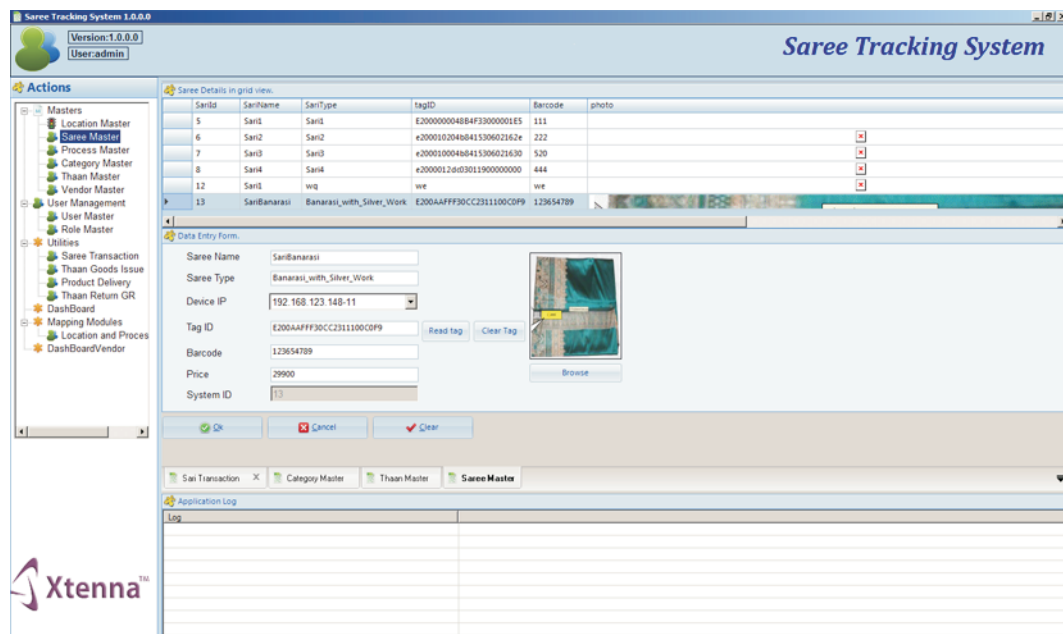


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Mapping module maps the IP address of each reader with its respective manufacturing process at that location. With this mapping, each saree can be tracked at its various processes.

Tagging and Assigning RFID Tags:

The operator affixes a barcode that has been generated by the existing Oracle system. A SOLANNA™ RFID tag is affixed along with the barcode sticker. The operator then uses the Saree Tracking System to associate the barcode with its RFID tag.



Scanning Process:

After a tag is assigned to each saree, it is read by Xtenna Proximity™ readers as the saree moves from process to process within the factory. At each of these process locations, the tag is read and its data is collected by the reader and updated in the central server. The saree's

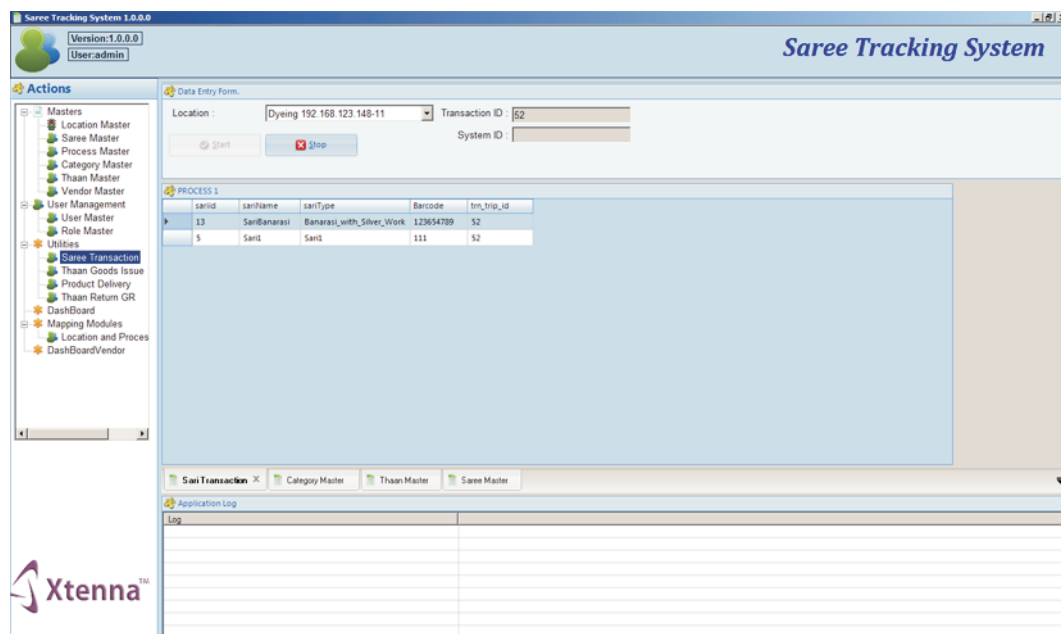




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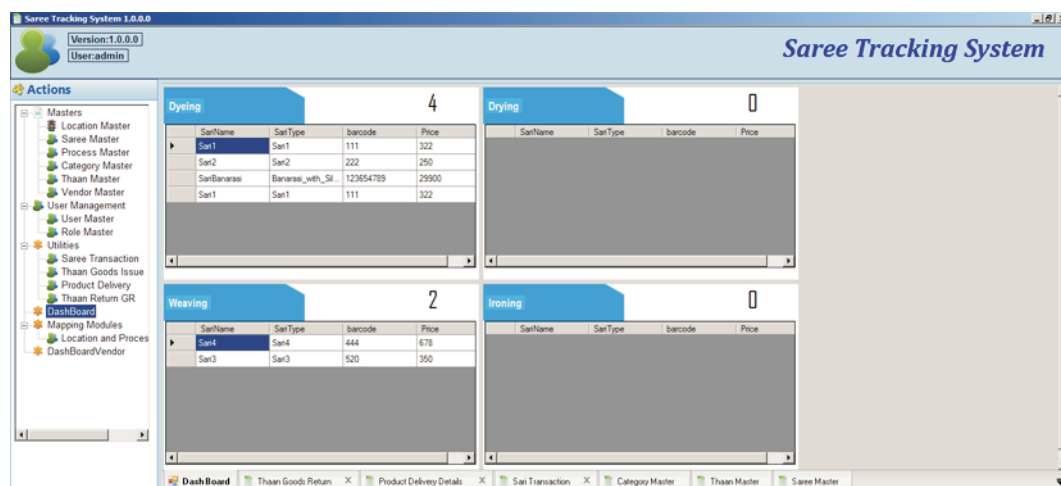
progress is tracked at each process such as dyeing, drying, ironing, etc. The operator can scan multiple sarees simultaneously thus saving both time and effort.

At each process location, the operator keeps the sarees on top of the Xtenna Proximity™ reader and runs the Saree Transaction module in the tracking software. The reader reads the tags on each of the sarees and displays their data on the screen.



Dashboard:

The dashboard enables the administrator to view the current status of all sarees at various stages of production. Each process such as weaving, dyeing, drying, ironing, etc. is displayed within a window along with its current statistics. Each stage displays data of the tracked items such as saree name, saree type, barcode, etc.



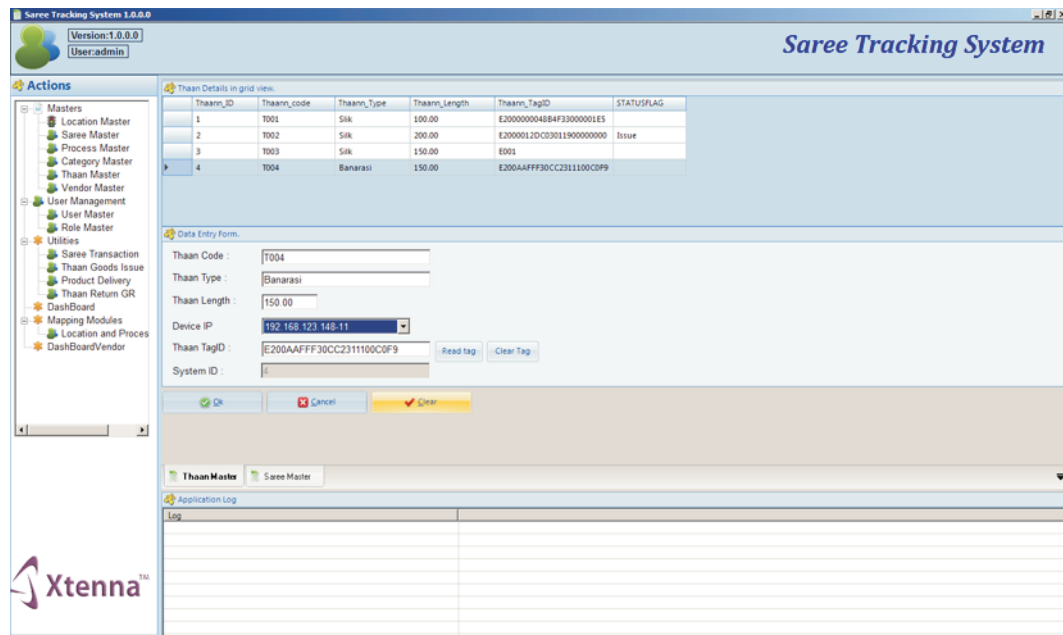


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Process Flow for 'Thaan' Tracking:

'Thaan' Master:

A SOLANNA™ tag is affixed to each 'thaan'. The tag is then registered into the database using Xtenna Proximity™, along with its details such as 'thaan' code, 'thaan' type, length, etc.



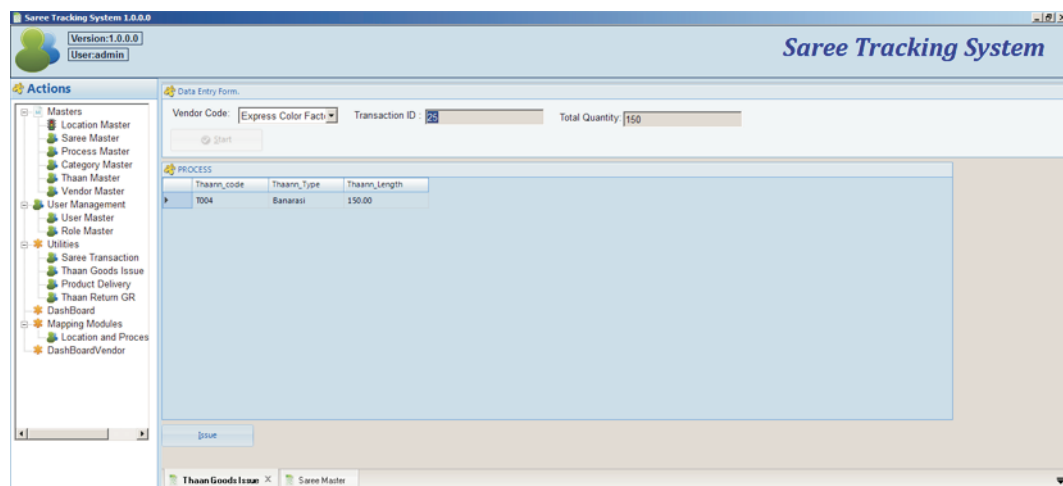
The screenshot shows the 'Saree Tracking System 1.0.0.0' interface. The top bar includes the version and user 'User:admin'. The left sidebar lists various modules under 'Actions', including Masters (Location Master, Saree Master, Process Master, Category Master, Thaan Master, Vendor Master), User Management (User Master, Role Master), Utilities (Saree Transaction, Thaan Goods Issue, Product Delivery, Thaan Return GR), DashBoard, Mapping Modules, and Location and Process (DashBoardVendor). The main area displays 'Thaan Details in grid view' with a table:

Thaan_ID	Thaan_code	Thaan_Type	Thaan_Length	Thaan_TagID	STATUSFLAG
1	T001	Silk	100.00	E200000048B4F3000001E5	
2	T002	Silk	200.00	E2000012DC0301190000000	Issue
3	T003	Silk	150.00	E001	
4	T004	Banarasi	150.00	E200AFFF30CC231100C0F9	

Below the table is the 'Data Entry Form' for 'Thaan Master'. It includes fields for Thaan Code (T004), Thaan Type (Banarasi), Thaan Length (150.00), Device IP (192.168.123.148-11), Thaan TagID (E200AFFF30CC231100C0F9), and System ID. There are buttons for 'Read tag', 'Clear Tag', 'OK', 'Cancel', and 'Save'. At the bottom, there is an 'Application Log' section.

'Thaan' Goods Issue:

The company also has fixed vendors to whom it supplies 'thaan' for producing sarees. These vendor details are saved into the database. When the company issues 'thaan' to vendors, the tag on each 'thaan' is read by a Xtenna Proximity™ reader and associated with the vendor to whom it is being supplied. Thus the number of 'thaan' issued to each vendor gets entered in the system.



The screenshot shows the 'Saree Tracking System 1.0.0.0' interface. The top bar includes the version and user 'User:admin'. The left sidebar is the same as the previous screenshot. The main area displays the 'Thaan Goods Issue' data entry form. It includes fields for Vendor Code (Express Color Fact), Transaction ID (25), and Total Quantity (150). Below these fields is a 'PROCESS' section with a table:

Thaan_code	Thaan_Type	Thaan_Length
T004	Banarasi	150.00

At the bottom, there are buttons for 'Issue', 'Thaan Goods Issue', and 'Saree Master'.



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Product Delivery:

The quantity of saree material produced by each vendor is displayed here and updated into the central database.

The screenshot shows the 'Saree Tracking System' interface. On the left is a navigation tree with categories like Masters, Utilities, and DashBoard. The main area displays 'Product Delivery Details in grid view' with a table containing columns: TRN_PROD_DELIVERY_ID, categoryname, Vendor_Name, PRODUCT_QTY, CONSUMED_QTY, CREATED_BY, CREATED_ON, MODIFIED_BY, and MODIFIED_ON. Below the table is a 'Data Entry Form' with fields for Vendor Name (Express Color Factory), Product Name (Banarasi Saree), Product Quantity (10), and Consumed Quantity (66.70). A 'System ID' field is also present. A confirmation dialog box is open, stating 'UPDATED THE RECORD FOR THE TRN_PROD_DELIVERY_ID VIA'. The bottom of the screen shows an 'Application Log' table and the Xtenna logo.

'Thaan' Return GR:

This maintains details of quantity of goods returned. After a vendor makes sarees from 'thaan' fabric, remaining 'thaan' material that is not long enough for creating another saree is returned to the manufacturer. The company keeps track of returned material for each vendor with details such as goods issued, quantity consumed and quantity returned by the vendor.

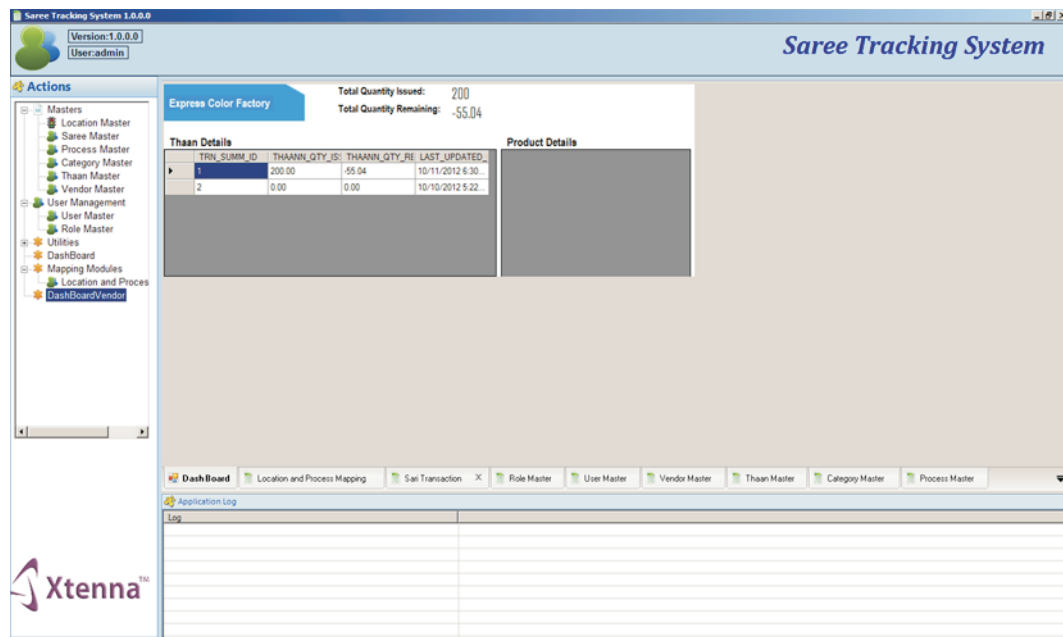
The screenshot shows the 'Saree Tracking System' interface for 'Thaan Goods Return'. The main area displays 'Thaan Goods Return Details in grid view' with a table containing columns: TRN_GR_ID, Thaan_TagID, Vendor_Name, GI_QTY, GR_QTY, CONSUMED_QTY, and THAAN_GR_DATE. Below the table is a 'Data Entry Form' with fields for Vendor Name (Express Color Factory), Device IP (192.168.123.148-11), Thaan Tag ID (E2000000048B4F33000001E5), Goods Issued Quantity (0.00), Goods Return Quantity (150.00), Consumed Quantity (150.00), and System ID (2). There are 'Read tag' and 'Clear tag' buttons. The bottom of the screen shows an 'Application Log' table and the Xtenna logo.



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Vendor Dashboard:

This dashboard screen enables the administrator to view the current status of 'thaan' issued to each vendor along with its consumed quantity and returned quantity.



TRN_SUMM_ID	THAANN_QTY_ISS	THAANN_QTY_RE	LAST_UPDATED
1	200.00	-55.04	10/11/2012 6:30
2	0.00	0.00	10/10/2012 9:22

BENEFITS:

- Accurate tracking of silk fabric production process.
- Enables maintaining of information of all processes separately in 'thaan' as well as saree manufacture.
- Instant and accurate information of 'thaan' issued to vendors and material returned by them from each individual 'thaan'.
- Convenient dashboard view displays all current process status.
- Accurate record of returned 'thaan' material enables reuse of that material in future production.



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LINKS:

Hardware:



Tags:



Software:



Reference Example:

<http://www.essenrfid.com/Mailer/manufacture-flash-demo.pdf>