

Creating RFID in auto

SkandSoft's RFID enabled SCM Pilot project using SkandSoft SETU 1.0 RFID platform and SAP R3 technology for one of the world's largest farm equipment and auto manufacturer helps track their inbound parts

Auto manufacturers need to manage large and complex supply chains, spanning many geographic regions, and pursue opportunities in diverse national markets to succeed. Cost competition is increasingly driving the industry toward global product offerings.

The Indian industry comprising of the automobile and the auto component sectors has shown great advances since delicensing and opening up of the sector to FDI in 1993. The industry has an investment of a sum exceeding Rs 50,000 crore. During 2003-04, the turnover of the automotive sector was around Rs 1,00,000 crore. The industry provides direct employment to 4.5 lakhs and generates indirect employment of 1 crore. The contribution of the automotive industry to GDP has risen from 2.77 per cent in 1992-93 to 4 per cent in 2003-04.

Today, India is the largest three wheeler market in the world, second largest two wheeler market in the world, fourth largest passenger vehicle market in Asia, fourth largest tractor market in the world and fifth largest commercial vehicle market in the world. However, the industry is facing

some tough challenges. Shortening product life cycles are affecting manufacturing cycle time, productivity, and inventory management. Customer empowerment has led to flexibility, higher manufacturing capacity costs and labor deployment challenges. Product quality requirements are becoming increasingly stringent, causing manufacturers to focus on "Zero Defects" production capabilities.

The key manufacturing areas in auto

Inventory

- Involves tracking locations of the aggregates, contents, moves and picks
- Dynamic updating and automatic reordering at set threshold limits
- Requires reducing inventory obsolescence by enforcement of conditions like FIFO/ LIFO
- External collaboration with suppliers to implement JIT

General Assembly

- All components necessary to finish the vehicle are assembled.
- Work is done in many stations – designed for high productivity
- Strict quality orientation, the highest level of flexibility and ergonomic standards.
- The vehicles are ready to be tested

before being delivered to consumers.

Paint

- Changing color in the painting process is expensive because of the wasted paint and solvent during color change.

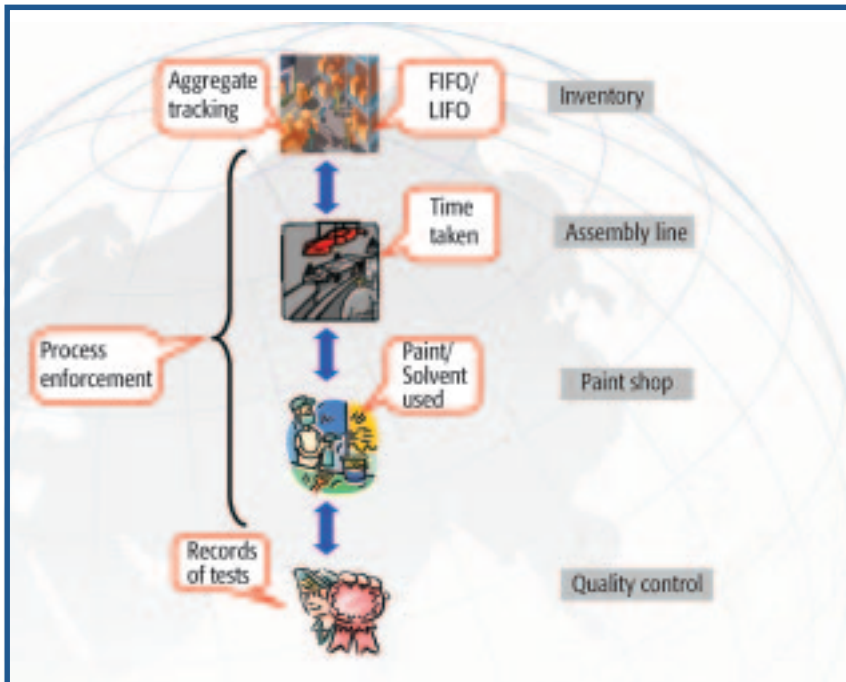
Quality Control

- Ongoing tests and checks are conducted to ensure the vehicle matches required specifications.
- Checkpoints are set up in all areas to ensure that defects do not seep through the process.
- Tests, such as dynamic vehicle tests and road tests, are performed.
- Other static tests are performed by reliable, high-tech test machines.
- Tests are performed on all aspects of the vehicle to ensure quality and reliability.

Impact of SETU™ on the Key Manufacturing Process

Inventory

- Real-Time information for efficient tracking of aggregates, contents, moves and picks
- Events based control mechanism for process enforcement enabled e.g. FIFO/LIFO
- Enables implementation of JIT
- Delivers swift and accurate cycle counting



The schematic above briefly describes the key entities in auto manufacturing and their interrelations.

- Different aggregates are stored in the warehouse or shipped directly on the assemble line (for a JIT system).
- On the general assembly line aggregates are married /assembled according to a pre-defined sequence.
- After the assembly, vehicles are taken through the paint shop.
- Prior to painting, automobiles are tested for different parameters and they are ready for dispatch.

- Prevents obsolescence

General Assembly

- Time taken for assembly is reduced by better coordination and management of the aggregates
- Integration of correct parts according to production schedule ensured
- Productivity measurement on individual employee level facilitated
- Quality standards enforced and ensured
- Kanban

The RFID tag can contain exact part and production line destination.

- Ensures accurate replenishment
- Decreases downtime drastically
- Reduces error correction expenses
- Improves work cell efficiency
- Work in Process Tracking

The RFID tag can contain the router produced by the WMS or ERP. The WIP material can be directed and routed at every checkpoint along the production process.

- Enables swift and accurate production sequence
- Improve quick changeover as the demand requires
- Increases flexibility
- Employee level productivity ensures recognition of appropriate and customised corrective actions for employees

Paint

Final assembly can be fixed with a RFID tag, which contains information regarding colour of the paint required. This input is generated from

Impact of SETU™ on Areas of Focus/ Concern

Data transparency across the chain

- Communication with arrays of proprietary interfaces, platforms, and communication protocols at shop-floor levels
- Integration with enterprise IT and third party applications
- Modeling of finite planning systems at granular levels
- Creation of accurate schedules

SETU™ & SkandSoft impact

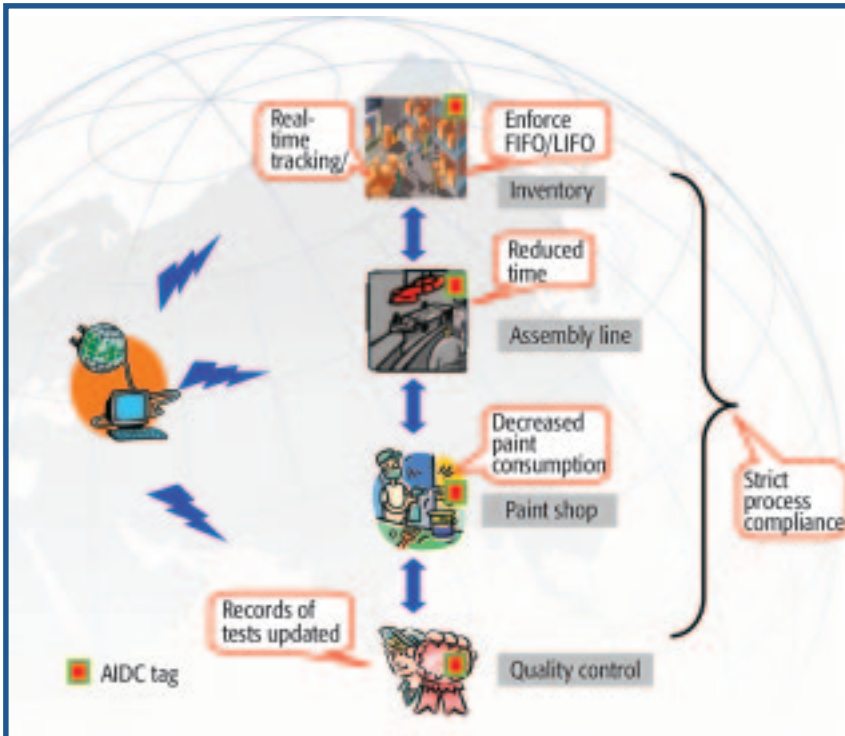
- Independent of data acquisition technologies, data formats, data interchange protocols/ standards, etc.
- Agnostic to multiple data entry formats, protocols, etc. by migrating all the disparate data to a common data format
- Enables seamless integration with enterprise IT for increased effectiveness
- Designed to accommodate data right from manual data feeds, to bar codes, to RFID, ZigBee, ICS like SCADA, PLC's, etc for modeling of systems at granular levels

Real-time Information across the Retail chain

- Dynamic information exchange
- Multi-location business control
- Information of inventory scheduling done at floor levels to planning and execution systems
- Information on last minute changes in customer orders for exact production schedules
- Systematically trace, rework and see WIP for resource planning efforts

SETU™ & SkandSoft impact

- SETU™ has an inherent advantage of being able to scale across physical business locations due to distributed computing architecture.
- SETU™ is designed and engineered to handle mega volume transactions and hence provides a single or multiple point collection/ access to Real-Time data collected from multiple data points.
- SETU™ supports collection of Real-Time data across various parameters like humidity, temperature, chemical, etc. to help monitoring of perishables and other specialty goods due to its ability to collect data from various technological devices.



The schematic above briefly depicts the environment of the SETU™ based automobile manufacturing solution

- Various assets are RFID tagged and the relevant details of the asset are written to the tag.
- RFID readers are strategically installed through out the work environment to form a grid.
- These readers are connected through a network to the SETU™ server

the production scheduling chart which helps in customised colour selection reducing workload imbalances and results in batching of same colours as far as possible. This helps in creation of colour blocks (or Paint Blocks) and sequencing of assemblies requiring same colour. This reduces the overall paint consumption, removes workload imbalances and makes the paint shop more responsive to production scheduling.

Quality

RFID tag is attached to each assembly, which contains information regarding various checks that have to be carried out on it. It facilitates establishment of effective checkpoints the configurations of which can be changed dynami-

cally. For example, a specific country/ region may have specific parameters for quality check, which can be enforced dynamically.

Conclusion

To be successful in increasingly time-sensitive and competitive markets, auto manufacturing processes have to be fast, flexible and quickly adapt to change. Achieving this objective requires integrated solutions that connect internal and external supply chains to factory processes, production equipment, and factory systems in a seamless, customer-centric network.

This calls for new ways of data collection and sharing in a Real-Time environment. The new technologies

Impact of SETU™ on Areas of Focus/ Concern

Extension of value of the Information/ Data generated

- Synchronized production across the chain and manufacturing network
- Implementation of JIT
- Improved delivery receipt & reconciliation
- Collaborate with forecasting, analytical systems
- CPF
- Sequential analysis
- Supplier performance rating

SETU™ & SkandSoft impact

- SETU™ driven solutions thrive on a complex computing curve right from masking data to filtering them through varied layers of filters for selection and analysis for business relevance.
- SETU™ can be seamlessly integrated with BI suites providing Real-Time data inputs for such applications.
- SETU™ allows Selective Data Treatment for optimal use of the data collected by applications like:
 - Raw Data to Business Analytics applications.
 - Aggregated Data to ERP.
 - Statistically Treated Data to Reporting/ BI Applications.
 - Correlated Data to ICS, etc.
 - PDM Product Data management

have to not only complement; insights gained by the manufacturing firms after years of experience; but also make the systems flexible to cater to the market dynamics.

RFID is the next evolutionary step in efficient automobile manufacturing. It makes it possible to synchronize the physical flow of goods and the related information flow without the need for human intervention. Efficiency gains arise from the avoidance of errors, from automation and from the ability to enforce and manage all processes effectively. It provides benefits for a variety of applications across the automotive value chain. **2.0**