MES in Plastic Part Manufacturing

motherson

Company Overview

- Founded in 1967, HQ in Germany

- Business Domain : Manufacturing of molded parts made of thermoplastics

- The company has an R&D department, tool and equipment construction facility, fabrication plant and paint shop

- A "full-service supplier" the company offers : Management of materials, development and tooling and sequential delivery of the plastic parts

- Implement Process optimization through efficient logistics involving agreement between the supplier's and the manufacturer's assembly plant on matters of transportation, lot size and assembly site details

Business Challenges

- Real time asset utilization monitoring

- Real time mBOM verification

- Real time WIP visibility

- Versatile OT integration- Multiple machine OEM's

- Multiple process capturing at a geographically huge plant site.

- Production control management

- Pre-stage Verification(Value streams)

- No real time visibility of machine parameters

- Paper based production order management

- No User Authorization/Control

- Availability of Vantage solution for integrating data sources from machine to ERP (single source for data truth)

MES in Plastic Part Manufacturing

motherson

Solutions Offered

- iDACS smart DA connecting different plant for OT system totaling to 600+ machines handling different protocols like Euromap 63, OPC-UA

- Data acquisition for process areas - Injection molding, paint shop, assembly lines

- ERP integration through RFC's for business transaction automation like production confirmations, day plans, etc.

- Single data injections source for Analytical systems

- iDACS plant utilization monitoring (OEE, TEEP)

Key Benefits

- ✓ Real Time Status for Production Monitoring

- ✓ Digital Aid for production /machine status visibility and employee management

- ✓ Minimized production loss for continuous improvement

- ✓ Systematic implementation of processes over assembly lines

MES in Automotive Industry

motherson

Company Overview

- Established in 1962

- One of the largest brake system supplier in India

- Product portfolio : Calipers, Actuations, Drum brakes, Valves, Hose ABS, Brake fluid, etc.

- Divisions : Brake Division, Foundry Division and Polymer Division

- Caters : Light vehicle, Commercial vehicle and the Off-highway segment

- 7 years+ engagement started with implementing traceability system in RM stores

- Gradually scaled relationship from WMS to Data Acquisitions, MES, Quality at multiple locations
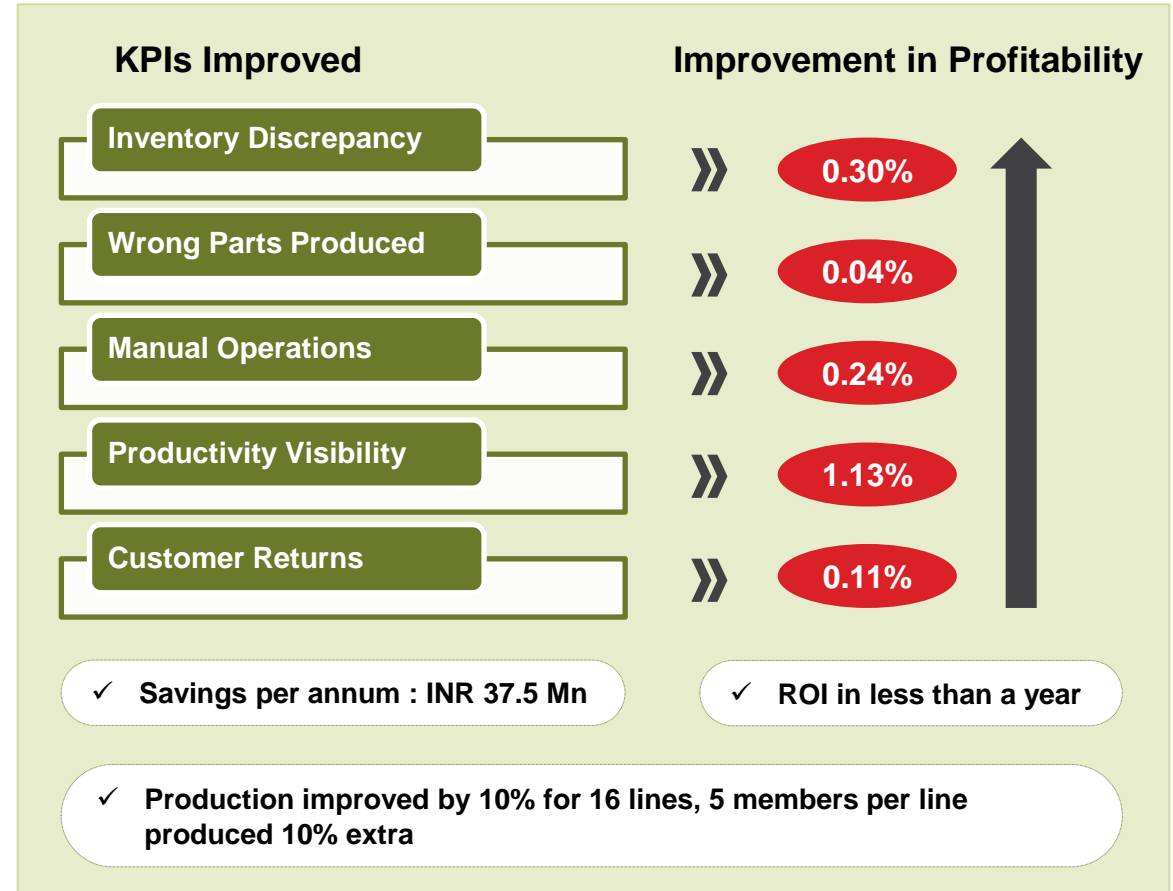
Business Challenges

- SFG, FG Individual or IoT Serialization & Traceability

- Low real-time visibility of WIP in value stream

- In-line systematic pre-stage verification for value-stream check in/out

- Controlling in-line site stores / supermarket for lean inventory management

- Process data retention > 15 years

- Manual discretion for RM FIFO management

- Manual RM pull systems

MES in Automotive Industry

motherson

Solutions Offered

- Stores modules - ekanban for material pull system
- Production control system
- End of line verification
- Data acquisition
- Quality assurance
- Warehouse management
- Business KPI reports / dashboards

Key Benefits

KPIs Improved   **Improvement in Profitability**

KPIs Improved	Improvement in Profitability
Inventory Discrepancy	0.30%
Wrong Parts Produced	0.04%
Manual Operations	0.24%
Productivity Visibility	1.13%
Customer Returns	0.11%

✓ **Savings per annum : INR 37.5 Mn**

✓ **ROI in less than a year**

✓ **Production improved by 10% for 16 lines, 5 members per line produced 10% extra**

Automotive Component Manufacturer
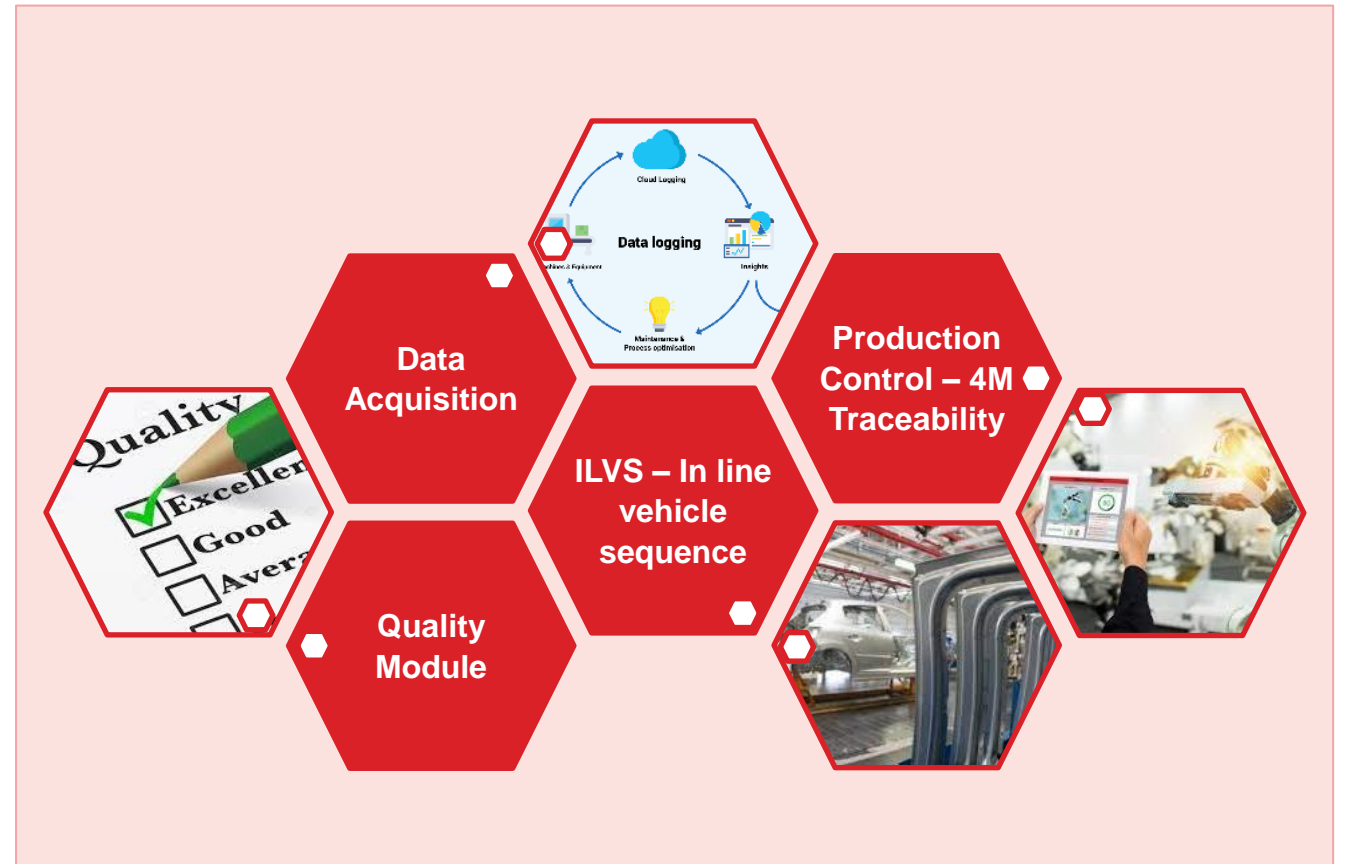
motherson

Company Overview

- Client provides products and services to Indian and Global automotive OEMs and Tier 1 suppliers

- Capabilities : Automotive Interior & Exterior Plastics, Composites, Sheet Metal Stampings and Engineering & Supply Chain
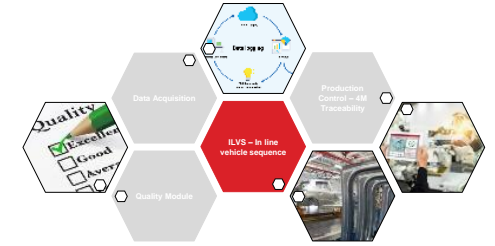
Business Challenges

- Capturing real-time process, quality & torque tool data

- Implementing backward traceability for 4 M
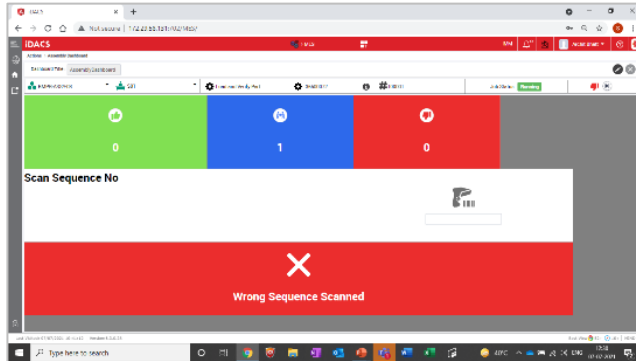
- MBOM validation

- Sequence Dispatching

Solutions Offered

Data Acquisition

Production Control – 4M Traceability

ILVS – In line vehicle sequence

Quality Module

(Solution details on subsequent slides)

Automotive Component Manufacturer

motherson

ILVS – In line vehicle sequence
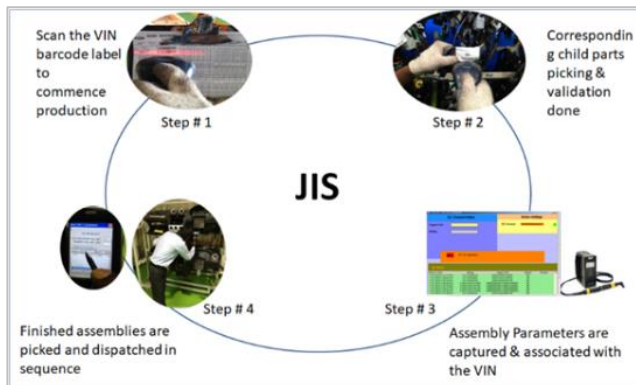

Problem Statement

- OEM published sequence in the form of triggers through Web portal. Since both work on the internet protocol, the firewall, router, ports management is the biggest challenge to overcome

- Another Concern - Automatic updates on the servers / client system
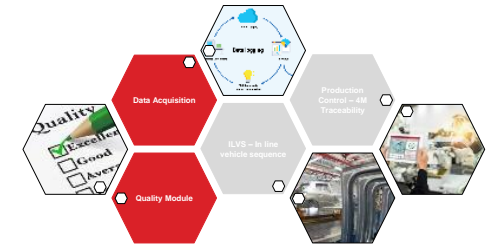
Solution

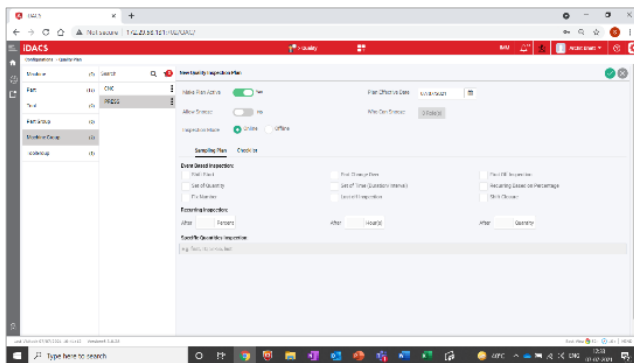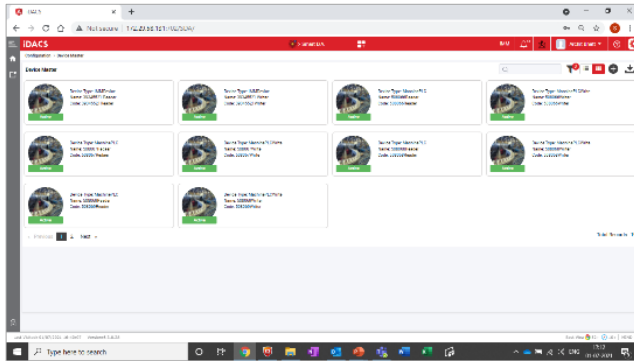- iDACS - Complete sequencing production & dispatch solution

Benefits

- Replaces manual data capturing

- Automatically downloads the sequence triggers with broad casting sheets, saved almost 2-man years of efforts (Plant runs 3 shifts a day)

- Zeroing down slippages to OEM

Automotive Component Manufacturer

motherson

Data Acquisition and Quality Module

Problem Statement

- Torque values manually recorded in register against the VIN detail
- Child part mapping done manually
- During reverse traceability, data mismatched, rejected material dispatched to end users

Solution

- iDACS – DA with Quality module

Benefits

- VIN scanning at stations possible
- Integrates directly with the torque tools to records the torque data, child parts and maps against the VIN
- Suggest the End of line operator with collected data to decide quality before despatch
- Reduced timeline and efforts for reverse tracking traceability reports published digitally
- 100 % removal of Wrong despatch to OEM
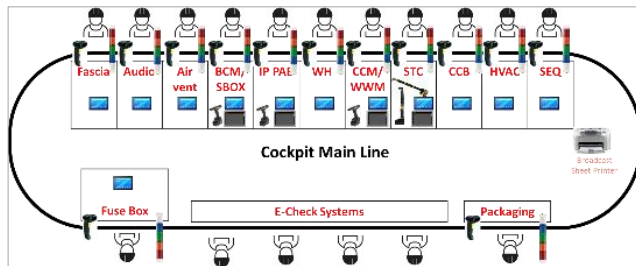
Automotive Component Manufacturer

motherson
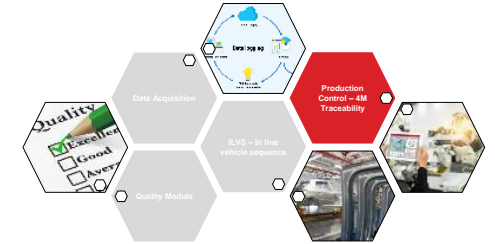
Production Control
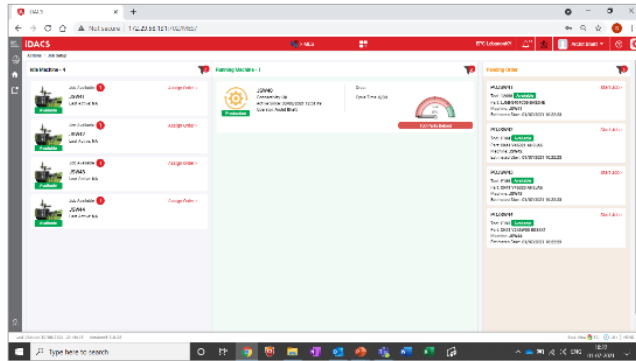
Problem Statement

- Challenges in selection of production order
- Notifying torque value

- Child parts BOM validation based on FG
- Capturing the result and previous station validation during dispatch

Solution

- iDACS – Production control

Benefits

- Child part validation (MBOM) Duplicate / Invalid, Previous station Validation, Parameter limits to torque tools, Plan quantity (non sequencing), WIP between two machines (non-sequencing, non-conveyor assembly),Scan interlock
- Increase in productivity and quality

Automotive Component Manufacturer

motherson

Key Benefits

Improvement in KPI's

IMPROVEMENT %

75%   70%   30%   98%

Percentage Reduced

■ Invoicing time ■ Work force ■ Storage space increased ■ Slippage losses
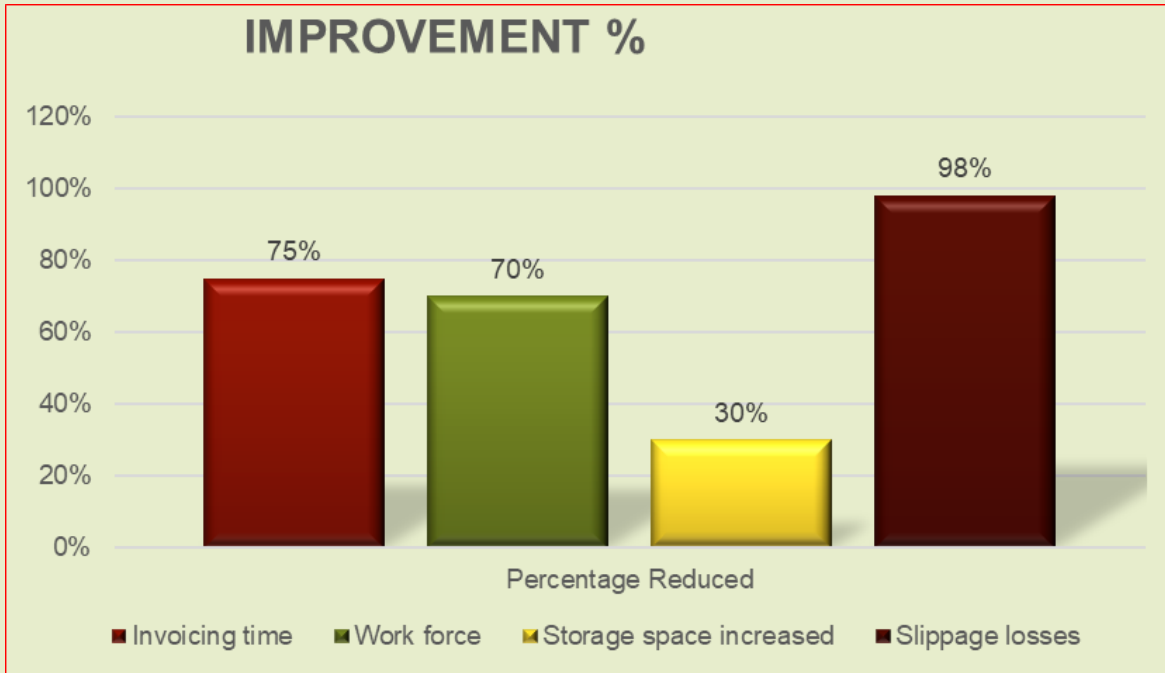
Efficiency Optimization Figures

Impact

Quantity / Shift

50.3%

400
300
200 — 149
100
0

Previous — 300 — Present

■ Previous ■ Present
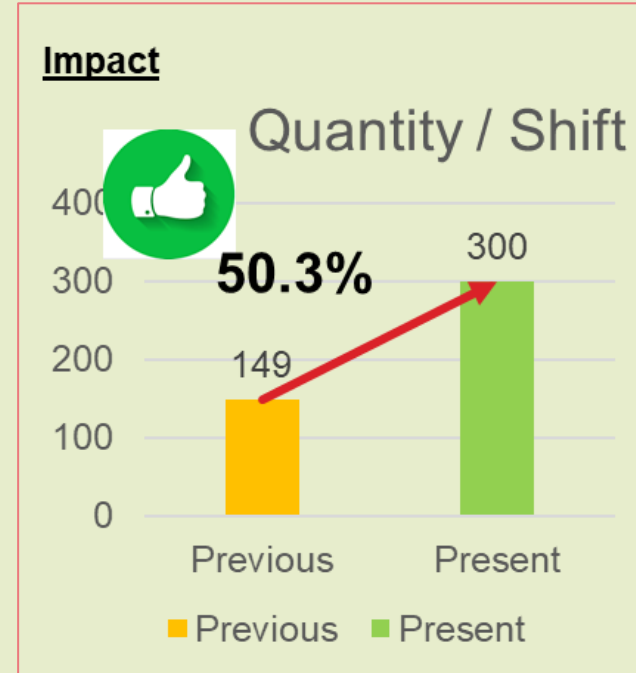
Impact on Overall Output

Distribution System - FMCG Industry

motherson

Company Overview

- Global FMCG Giant established in 1932

- **Need**: Design and develop automated distribution system to cater South India from one of their biggest depots which enabled for the first time for them in India to get their distributions from n+3 days to n+1 day *(n being the day when the orders were taken)*

Business Challenges

- Complex distribution system (supply chain complexity)

- Private Label Printing requirement

- Integration of Distribution system with existing ERP systems

- Errors in picking

- Bin Traceability and Location management problem

- Shipping management Challenges

- Inaccurate stock management & managing vast SKU's

- Alert Management for customised notifications

- **Lack of well organised distribution process**

- **Needs digitisation & automation**
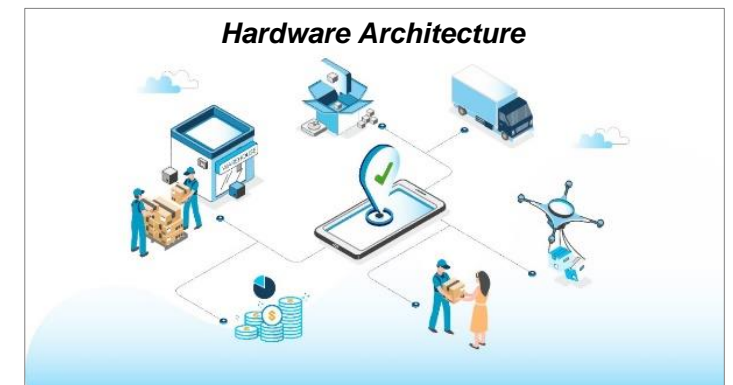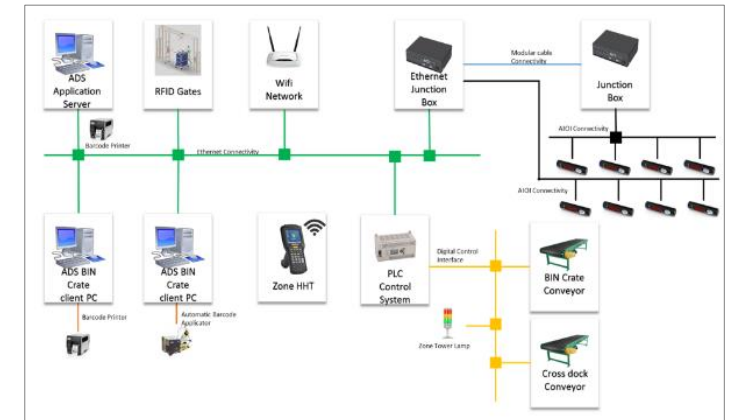
Distribution System - FMCG Industry

motherson

Solutions Offered

MIND designed, developed & implemented an automated distribution system **'ADS'** which caters to optimised and simplified distribution process:

- Redesigned Distribution Process Flow & data collection

- Integrated with ERP & other existing platforms

- Smart Printing Solution Barcoding & Label printing

- Pick to light Solution, so that operator could pick more accurately

- Binning Management, mapping for enhanced traceability

- Location management

- Shipping Management

- Tailored alert by Rule Engine

- RFID tagging for traceability

iDACS Modules Deployed

Inventory

Enabler

Rule Engine

Hardware Architecture

Distribution System - FMCG Industry

motherson
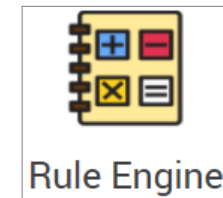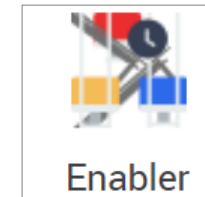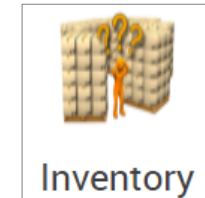
Solutions Offered: iDACS Process Flow

User will generate the label based on the pick sequence

Based on the pick sequence no printed on the barcode user will pick the material and manually paste the barcode on the box

Barcoded boxes will move to the staging area for sorting purpose

Barcoded boxes are binned at pre-storage location

Boxes are moved to PPC location, Scanned & loaded to the conveyer

Boxes and Bins brought after weight check & beat level label printing done. Finally move to the pre-shipping storage area

Bins are scanned, weighed, barcode label generated by system, applied on bin & finally moved to pre – shipping area

Filled bins loaded on the trolley & taken to the conveyer & moved to the barcoding Station

For loose quantity requirement, boxes are scanned and load at manual conveyer by zone operators & required quantity displayed order wise on the PTL mounted on the racks & the respective quantity is picked & put into the bin

Boxes and bins are received at pre shipping area, here scanned & scanner shows the location information or free location where boxes and bins need to be moved.

To confirm operator will scan the location ID (RFID or Barcode) & boxes, bags or bins are binned at pre-shipping location.

For shipment operator will enter the truck no; select distributor and beat no & according scan the box, bin or bag as per the beat sequence retailer wise & confirm the movement of stock from the pre-shipping area to destination shipping location

Boxes are scanned, weighed, barcode label generated by system, applied on Boxes & finally moved to pre – shipping area

For Full boxes requirement, boxes are loaded to the motorised cross dock conveyer & moved to barcoding station

Distribution System - FMCG Industry

motherson

Key Benefits

✓ **Savings across Direct and Indirect cost**   ✓ **Manpower Efficiency increased considerably**

Main Warehouse
- ✓ 0% stock mismatch
- ✓ 15% reduction in manpower
- ✓ Realtime visibility of stock
- ✓ Slow, Fast, high & low value analysis
- ✓ JIT procurement

- • Lot Traceability
- • Barcode / RFID labels
- • FIFO Control
- • Closed Loop issuance.
- • Shortest distance algorithm for faster picking.

Party packing
- ✓ 80% productivity improvement
- ✓ Part & order traceability – customer compliance
- ✓ 20% capex savings
- ✓ 0% rejections achieved multiple times.

- • Order - Lot Traceability
- • Barcode / RFID labels
- • FIFO Control
- • Closed Loop issuance
- • Beat Sequence Production
- • Order qty based on online weigh check.

Packaging
- ✓ 0% customer returns
- ✓ 0% wrong dispatch
- ✓ Customer Compliance

- • Internal / Customer labels
- • Right, OK part validation

Dispatching
- ✓ 0% deviation in invocing.
- ✓ 15% reduction in manpower

- • Sequencing
- • Auto Invoice linking using RFID.
- • FIFO
- • Bin tracking.

Distribution Warehouse
- ✓ 18 nos. - manpower reduction
- ✓ 0% sorting mismatches
- ✓ 100% reduction in delivery time

- • Pick 2 Light
- • Automatic Sorting
- • RFID based Bin movement

✓ **Increased market demand**

✓ **Reduced challenge of intact CLD shortage to ~ 0%**

✓ **Improved overall depot efficiency**