Manufacturing Traceability System

"Pro-Trace"

by

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Traceability

Traceability means:

"Being able to provide evidence that:

- The manufacturing process was followed in the correct sequence;

- Critical to Quality parameters were adhered to at each operation;

- All Items supplied were within Specs at all operations (no defect forward);
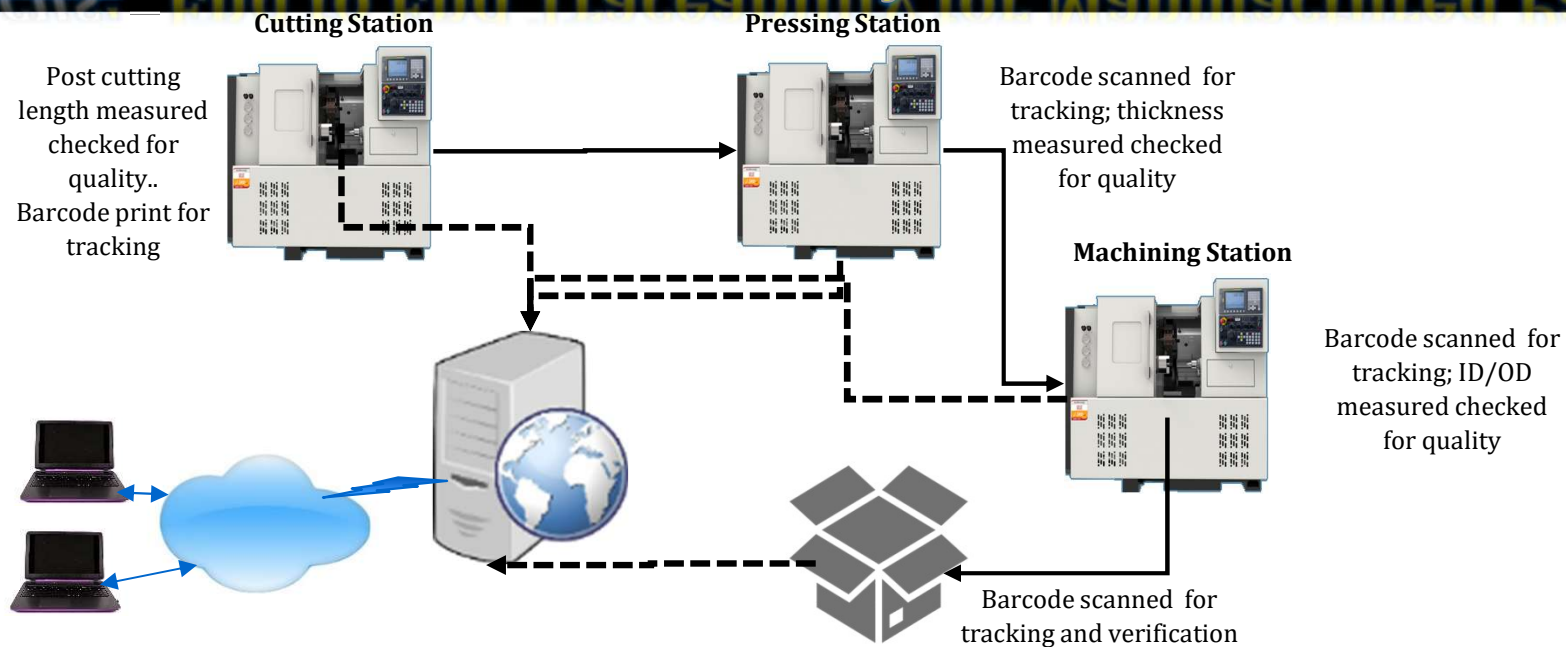
- material/s used met with the Specifications"

➢ Auto-Industry is adopting the Industry 4.0 and ISO 8402, that expect traceability to be maintained

➢ 'Product Recall' Regulation for the "Auto-Industry"

➢ A Product recall or a field failure may result in charging cost of the replaced components to the "Part Supplier" unless the part Vendor can prove otherwise. HOW?

▪ By recreating the manufacturing process followed and prove that the CTQs, CTPs, and the materials used, at each operation were within specs.

▪ **Only the "Traceability" System can provide this facility**

Our Focus: **End to End Traceability for Manufactured Parts**

Cutting Station

Post cutting length measured checked for quality.. Barcode print for tracking

Pressing Station

Barcode scanned for tracking; thickness measured checked for quality

Machining Station

Barcode scanned for tracking; ID/OD measured checked for quality

Barcode scanned for tracking and verification

Features	**Benefits**
• Inward batch no. and GRN stored for end-to-end traceability	• No Defect Forward policy can be implemented
• Duplicate input scan warning/error	• Assembly station verification against BOM defined
• Recording of sub-contract outward and inward	• Batch or individual identification can be incorporated for tracking and traceability
• Operator ID recorded for each operation	• Sub-contract work material verification
• Dimensional parameter for each station if any stored with quality verification	• Accessible via a web browser from anywhere 24X7
• Unless quality Okayed from previous operation, next operation not allowed	• End to end traceability
• Many more......	• Many more....

Example *of* Traceability in
the manufacturing process for a Component

Process	Notes
10 Machining CNC 1	**Input** is a forging/casting/Bar. QR code on the bin scanned **Output:** to Op 20 as in a cell. M/C #, Op-#, timestamp saved
20 Machining CNC 2	M/C #, Op#, timestamp saved. Para measurements stored against the op # with OK indicator. ID no and/or the Bin # stored
30 LEAK TESTING	QR code on input bin or OK component scanned and CTQ readings with OK indicator, and the output Bin No stored.
40 Visual Inspection	QR code on input bin or OK component scanned and CTQ readings with OK indicator, and the output Bin No stored.
50 Thermal Oxidation	Enter Batch #, scan each input part put in the chamber, read opn start time, CTPs set and stop time. Link each part with all data.
60 Final Inspection	Scan the Part ID, measure and capture all CTQs, if OK put in the Bin for packing. **Display On line SPC run charts.**
OP 70 PACKING	Scan each part being put in a packing box. When PB full, generate PB#, print packing doc. Store each part# with the PB ID
Equipment	QR code reader at each station. Part ID Etching M/C at the first QA station. Printer at the Packing.

Some of the Additional Features Required:

✓ Antecedents of the Critical Bought out materials, used in the assembly, to be maintained.

✓ Ensure that all parts required for the assembly have been fitted and if not, do not allow the assembly or the product to be dispatched.

✓ Provision to allow subcontracting of some operations

✓ Batch operations like Painting, Shot blasting to be catered to.

Would the Traceability System meet the Requirements?

➢ Given the QR code provided on the part (or the Product), the system can recreate manufacturing process followed and the material/s used.

➢ Each operation would provide:

▪ The machine, operator, the Process CTPs, and date/time

▪ Measurements of the CTQs and the OK status.

▪ Antecedents of the Input materials if applicable

➢ Given the above data no OEM can fault the Supplier and Stake a claim

Additional Benefits of Traceability

- ➢ Provides an accurate WIP status at each operation both before and after
    - ▪ Helps in Identifying the Bottlenecks and assists in Production Planning
    - ▪ Enables introduction of the Kanban System
- ➢ Provides data for the Quality Improvement projects
- ➢ Helps in faster and accurate response to customer status queries
- ➢ Competitive edge
- ➢ …………

Summary

- Traceability system is absolutely necessary in general and for export in specific

- It can be implemented very effectively

- It requires a detailed study
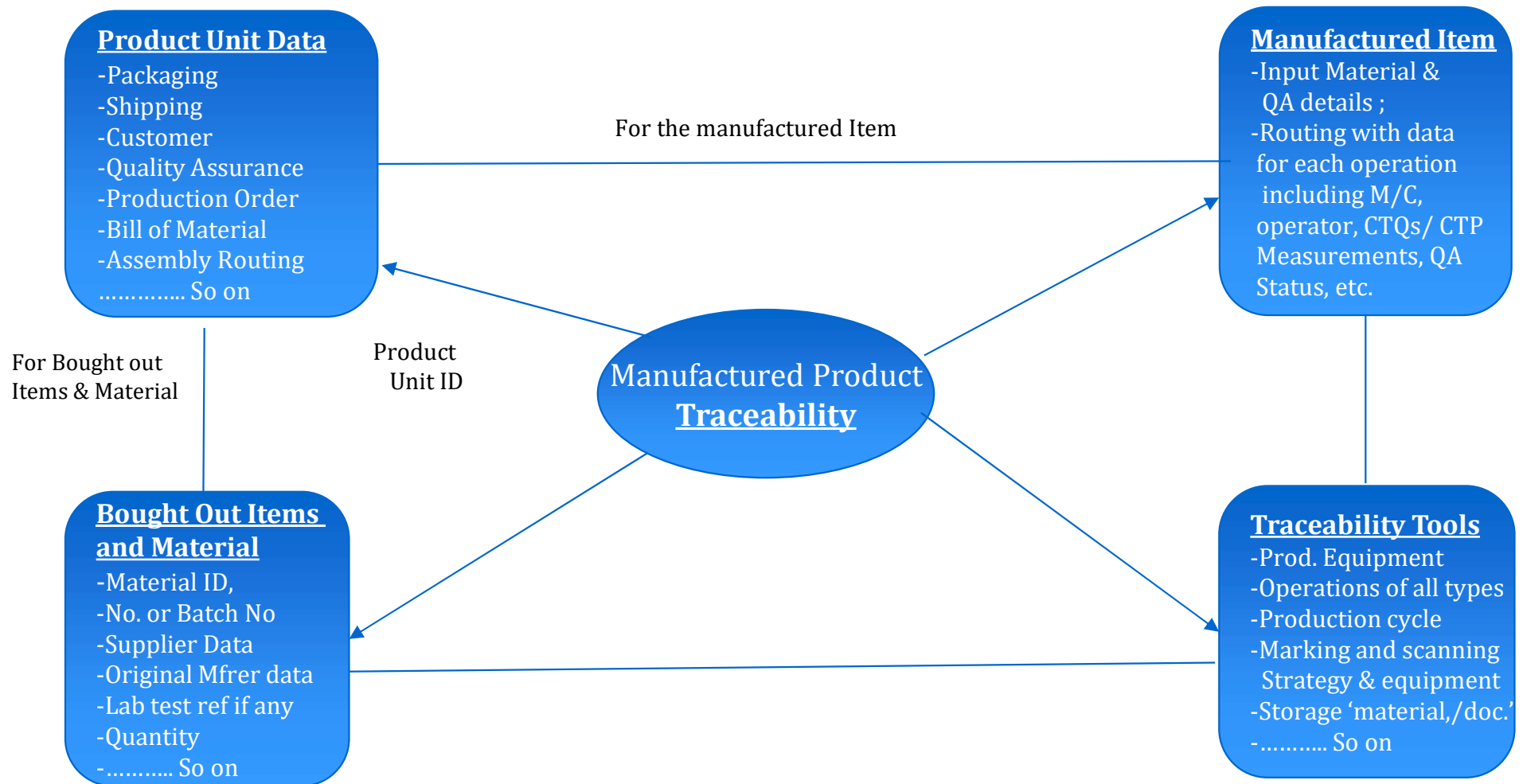
- The benefits pay for itself

Traceability Entities and Tools

Traceability is

the "Ability to recreate the process followed in manufacturing a product Unit"

Product Unit Data
-Packaging
-Shipping
-Customer
-Quality Assurance
-Production Order
-Bill of Material
-Assembly Routing
………….. So on

For the manufactured Item

Manufactured Item
-Input Material &
 QA details ;
-Routing with data
 for each operation
 including M/C,
 operator, CTQs/ CTP
 Measurements, QA
 Status, etc.

For Bought out
Items & Material

Product
Unit ID

Manufactured Product
Traceability

Bought Out Items and Material
-Material ID,
-No. or Batch No
-Supplier Data
-Original Mfrer data
-Lab test ref if any
-Quantity
-……….. So on

Traceability Tools
-Prod. Equipment
-Operations of all types
-Production cycle
-Marking and scanning
 Strategy & equipment
-Storage 'material,/doc.'
-……….. So on

Thank You

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