Flowcharting Your Quality System

Quality Time Montana, LLC
7-25-2018
QTM@Q.COM
Quality systems

• Manage the flow of work and information through a company, from order entry to shipping.
• Use *process control* to *prevent* quality problems.
• Provide consistency and improvement in your operations.
• If required, your Quality System can be audited and certified by a third party registrar to a Quality Management System (QMS) standard, e.g. ISO 9001.
• ISO 9001 makes an excellent checklist for any Quality System, even if you are not seeking a certified QMS.
Overview

• Flowcharting can make developing and implementing your Quality System easier.
• Flowcharting helps define process, responsibilities and relationships in a company.
• Flowcharting provides a bases for Risk Management and Continual Improvement.
• Each company has unique processes. This presentation shows examples of process flowcharting, which are not intended to be implemented as your own processes.
Start at the bottom

- Develop your Quality System from *existing process*, rather than develop processes to address QMS requirements (the Top-Down approach).
- Flowchart your existing process first (the “as-is condition”), then review and revise to improve the process and to address QMS requirements (the “as-should-be condition”).
Flowcharting process

FLOWCHARTING PROCESS
Kurt Borge 5-8-18

Author draws flowchart to define the “as-is” process.

Reviewers comment to improve process, address requirements, make corrections etc.

Author revises flowchart to “as-should-be” and resubmits for reviews.

Flowchart Done?

no yes

Document Control distributes flowchart.

IMPORTANT POINTS

Begin with the “as-is” process, then revise to “as-should-be.”

Flowchart as group using a white board, flip chart with sticky notes, etc.
Typical quality system processes

- Planning Activities
- Order Entry
- Design & Development
- Purchasing
- Manufacturing & Inventory Control
- Testing and Inspection
- Monitoring, Measuring & Analysis
- Training
- Document & Records Control
- Calibration
**Sales** receives customer order by phone

Check customer database

**Established Customer?**

- Yes: Enter order into database.
- No: Start new account and enter customer information.

Review order with customer and make any corrections

Check database inventory

**Product available?**

- Yes: Add lead time and provide delivery date to customer.
- No: **Sales** telephones **Manufacturing** to request lead time.

**Manufacturing** enters customer order into MRP to calculate lead time and telephones **Sales**.

**Sales** calculates delivery date and calls customer.

**Delivery date OK?**

- Yes: Generate and print manufacturing work order.
- No: Cancel order

Deliver work order to mail room.

**Purpose:** to get accurate customer order information to manufacturing.
Adding risk management

• Risk management is the new focus for developing Quality Systems.

• Flowcharts can be used to identify potential risks:
  ➢ data entry errors
  ➢ manufacturing errors
  ➢ wrong formulation

• After the risks have been identified, manage them by reducing the chances of risks occurring and their impact if they do occur.

• If you make significant changes, use risk management again.

• The following flowchart for the Telephone Orders process has areas of higher risk highlighted in rose, showing where measures are needed to minimize the possibility of data entry errors:
**Sales** receives customer order by phone

- Check customer database
  - **Established Customer?**
    - **No**
      - Start new account and enter customer information.
    - **Yes**
      - Review account information with customer and make corrections.

- Enter order into database.

- Review order with customer and make any corrections

- Check database inventory

- **Product available?**
  - **No**
    - **Sales** telephones **Manufacturing** to request lead time.
  - **Yes**
    - **Manufacturing** enters customer order into MRP to calculate lead time and telephones **Sales**.
    - **Sales** calculates delivery date and calls customer.

- **Add lead time and provide delivery date to customer.**

- Generate and print warehouse work order.

- Deliver work order to mail room.

**Reviewing information with customer reduces risk of data entry errors**

**Risks from multiple data entries**
Risk management example (cont.)

• The first two highlighted blocks show how to minimize entering wrong customer information by reviewing the information with the customer.
• The next set of highlighted blocks, starting when Sales has to telephone Manufacturing for a lead time, show potential data entry problems due to the number of times data must be entered or transferred. A possible solution might be an integrated database.
Process improvement example

• Flowcharts can be used to identify areas for improvement.
• Improvement is an ongoing process.
• The first “Receiving Inspection” flowchart shows the “as-is condition” for receiving inspections.
• The second flowchart shows the process after improvements were added in green, the “as-should-be condition.”
• Quality metrics have been added to gather data for “Continual Improvement.”
RECEIVING INSPECTION in the AS-IS CONDITION
7-24-18  Kurt Borge

**Purpose**: to enter materials received into MRP system and release them to manufacturing.

- Materials arrive and the Receiving Clerk is called.
- **Receiving Clerk** prints copy of PO from MRP system.
- **Receiving Clerk** compares material part numbers and quantities against PO, and writes discrepancies on PO.
- **Receiving Clerk** delivers hardcopy PO to purchasing.
- **Purchasing** releases materials to Manufacturing in MRP system.
- **Manufacturing** decides if quality is good enough to be used in production.

RISK OF BAD QUALITY MATERIALS USED IN PRODUCTION.
RECEIVING INSPECTION with IMPROVEMENTS and METRICS
7-5-18 Kurt Borge

**Materials arrive and the Receiving Clerk is called.**

**Receiving Clerk** prints copy of PO from MRP system.

**Receiving Clerk** compares material part numbers and quantities against PO, and writes discrepancies on PO.

**Receiving Clerk** inspects materials against Quality Spec and for damage. Records results on Receiving Inspection Form.

**Material Review Board** (Manufacturing, Engineering & Quality) decide if nonconforming materials can be used.

**Receiving Clerk** updates Receiving Inspection Form and PO. Delivers forms to Purchasing.

**Purchasing** returns nonconforming materials and Receiving Inspection Form to supplier. **Purchasing** records inspection results in supplier performance tracking system.

Materials OK?

- Yes: **Purchasing** releases approved materials to Manufacturing in MRP system.
- No: **Purchasing** returns nonconforming materials and Receiving Inspection Form to supplier.

**Purchasing** adds Quality Specs to Materials Requirements Planning (MRP) system, so the specs will show on the Purchase Order (PO).

**Purchasing** releases approved materials to Manufacturing in MRP system.

**Engineering** prepares Quality Specs for purchased materials.

**Purchasing** adds Quality Specs to Materials Requirements Planning (MRP) system, so the specs will show on the Purchase Order (PO).

**Purchasing** releases approved materials to Manufacturing in MRP system.

**Purchasing** returns nonconforming materials and Receiving Inspection Form to supplier. **Purchasing** records inspection results in supplier performance tracking system.

**Material Review Board** (Manufacturing, Engineering & Quality) decide if nonconforming materials can be used.

**Receiving Clerk** updates Receiving Inspection Form and PO. Delivers forms to Purchasing.

**Purchasing** returns nonconforming materials and Receiving Inspection Form to supplier. **Purchasing** records inspection results in supplier performance tracking system.

**Purchasing** releases approved materials to Manufacturing in MRP system.

**Purchasing** adds Quality Specs to Materials Requirements Planning (MRP) system, so the specs will show on the Purchase Order (PO).

**Purchasing** releases approved materials to Manufacturing in MRP system.

**Purchasing** returns nonconforming materials and Receiving Inspection Form to supplier. **Purchasing** records inspection results in supplier performance tracking system.

**Purchasing** releases approved materials to Manufacturing in MRP system.
Improved receiving inspection

• Now, only good materials reach production.
• Quality specifications have been established and communicated to the supplier and the receiving inspector.
• Quality issues are communicated to the supplier for their corrective action.
• Supplier performance is tracked for trends and improvements.
Conclusions

• Quality Systems help your company manage all the processes affecting quality from order entry to shipping.
• Flowcharts simplify the creation of Quality Systems by beginning with your existing processes, which are then reviewed for improvements.
• When needed, review the flowcharts for compliance with QMS requirements (e.g. ISO 9001).
• Flowcharts help identify and manage risks.
• Flowcharts help identify areas for ongoing improvements and quality metrics.
Quality Time Montana, LLC

Helping companies develop effective Quality Systems

Kurt Borge, consultant

QTM@Q.COM