Welcome!
Process Mapping Workshop
Acknowledgements


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Introduction
Workshop Outcomes

• Understand:
  – Basics of process flow diagrams (PFDs)
  – Benefits of process mapping
  – Process mapping applications
  – How to create process flow diagrams
  – Methods needed for effective and efficient process mapping
  – Understand how to identify process improvement opportunities

• Be able to:
  – Create technically correct process flow diagrams

About SatiStar
Business Performance Improvement Consulting

Our mission

To experience the joy of helping our clients excel at what they do.
Our expertise . . .

Performance Breakthrough
Information Systems
Satistar
Management System Standards
Leadership & Cultural Transformation
Operational Effectiveness

Some of our clients . . .

[List of client logos]
# You can’t beat the experience!

<table>
<thead>
<tr>
<th>Manufacturing</th>
<th>Non-Manufacturing</th>
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<td>Blood Products</td>
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<td>Industrial HVAC</td>
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<td>Label Manufacturing</td>
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<td>Machining</td>
<td>Management Consulting</td>
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<td>Metals</td>
<td>Wire &amp; Cable</td>
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<tr>
<td>Mold Design &amp; Mfg.</td>
<td>Wood Products</td>
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</tbody>
</table>

We walk the talk . . .

SatiStar is an ISO9001:2008 registered organization
Process Flow Diagrams

Process Improvement Approaches

Radical
- MA&T
- KTA
- ANOM
- BPR
- DOE
- MCS
- TPM
- LSS
- Lean
- FMEA

Corrective
- COQ
- 8D
- HRPS
- IA
- SPC
- CA

Preventive
- 5S
- PA
- Kanban
- CI
- 6σ
- MP
- STD

Incremental
- PFD
- POUS
Process Approach

Typical processes in many organizations

- Sales
- O/E
- Scheduling
- Purchasing
- Design & Development
- Manufacturing
- Warehousing
- Shipping
- Receiving
- Customer Satisfaction
- Management Review
- Internal Audit
- Corrective Action
- Preventive Action
- Continual Improvement
- IM&T
- NCR
- MRB
- Document Control
- Training
- Recruitment & Selection
- Performance Appraisal
- Business Planning
- Calibration
- Preventive Maintenance

Brainstorm on Processes from Home

Propose some examples of processes that are found at home
History of Flowcharting

First introduced in 1921 in the presentation “Process Charts—First Steps in Finding the One Best Way”
Quickly integrated into industrial engineering curricula.
First used in North America as part of a structured improvement program by Proctor and Gamble in 1945
Introduced as 1 of the seven Quality Control tools in Ishikawa’s famous Quality Handbook
Integrated into all world class process improvement methodologies
Numerous variations and types of process flow diagrams now exist
Increasingly being integrated into the business world as a basic business tool

Applications of PFDs

Primary tool used for process:
- Design
- Control
- Troubleshooting
- Analysis
- Improvement
- Standardization (basis for high quality procedures and work instructions)
PFD tools are included in all world class improvement methodologies
Excellent as Training aids
Characteristics of a Process

It can be:
- Diagrammed
- Measured
- Audited
- Improved
- Managed

Process

Definition

A set of logically related activities that produce a specified output

Processes can be created by design or by accident

Processes are often represented visually by process flow diagrams
Process Flow Diagram

Definition

Visual depiction of a process

Shows all process steps

Shows all interfaces (inputs and outputs) to other processes

Primary method of characterizing and understanding processes

Also called process maps or PFDs

Model Process Flow Diagram

Model Process Flow Diagram
B. Bunny
2014-08-08
Benefits

Creates a useful visual representation of the process flow and sequence

Enables:
- Rapid and clear understanding of the process flow
- Process analysis
- Creation of PFD-based procedures and work instructions
- Cause analysis (PFDs integrate well with Cause and Effect diagrams)
- Process improvement
- Process auditing
- Troubleshooting and problem-solving
- Training
- Efficient and effective capture of process information

Process Flow Diagrams

Every process flow diagram must have a heading to clearly identify it

- The heading should consist of:
  - A title indicating what the process is and where the process is located
  - The date when the diagram was made
  - The author of the diagram, which can be an individual or a work group
  - Additional information relevant to the purpose of the PFD

The other components of the process flow diagram are the steps and actions in the process
Process Flow Diagram Components

INPUTS - the materials, information, or action that initiate the start of the process, i.e. raw materials, parts, reports, order forms, etc.

OUTPUTS - the results of your process, i.e. Products, reports, services, new concepts, etc.

ARROWS - indicate the progression of the process.

STEPS/ACTIONS - the operations performed in the process

DECISION POINTS - the places in the process where a true/false, yes/no, pass/fail determination must be made

HOOLDING/WAITING STEPS - the places in the process where action is temporarily halted

LOOPS - paths that take you back (or ahead) to other steps

Process Flow Diagram Symbols

These components are represented by various symbols

There are no universally accepted symbols for process flow diagrams; however, we will use the symbols on the following slide

If you use additional symbols, a legend or key identifying special symbols is necessary
### Process Flow Symbols: A Legend

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Shape</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oval</td>
<td>Inputs and outputs</td>
<td></td>
</tr>
<tr>
<td>Box</td>
<td>Steps or operations performed in the process</td>
<td></td>
</tr>
<tr>
<td>Circle</td>
<td>Holding steps</td>
<td></td>
</tr>
<tr>
<td>Diamond</td>
<td>Decision steps (yes/no, pass/fail, true/false, etc.)</td>
<td></td>
</tr>
<tr>
<td>Home plate</td>
<td>Connector linking diagrams that span more than one page</td>
<td></td>
</tr>
<tr>
<td>Arrow</td>
<td>Indicate direction of flow</td>
<td></td>
</tr>
<tr>
<td>Loop</td>
<td>Take you back to earlier steps (rework) or bypasses steps</td>
<td></td>
</tr>
<tr>
<td>Color</td>
<td>Used to focus attention on a particular part of the process</td>
<td></td>
</tr>
</tbody>
</table>

### Customer Service - Handling Complaints

- **Customer calls with complaint**
- **Conversation about nature of complaint**
- **Am I right person to deal with?**
  - **N** Forward call to proper person
  - **Y** Thank customer. Promise to call back with answers.
- **Contact proper department to get answer**
- **Hold until all inputs are received**
- **Call customer back with answer**
  - **Y** Is customer satisfied?
  - **N** Forward call to proper person
  - **Y** Close file

I.M. Courteous 2014-08-08
Level of Detail

![Flowchart showing the level of detail process hierarchy]

Process Hierarchy

<table>
<thead>
<tr>
<th>Level of Detail</th>
<th>Processes</th>
<th>Tool</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Receive Order → Schedule production → Order materials</td>
<td>BFD</td>
</tr>
<tr>
<td></td>
<td>Determine inventory → Update schedule → Implement schedule</td>
<td>PFD</td>
</tr>
<tr>
<td>High</td>
<td>Identify late orders → Add new orders → Prioritize all orders</td>
<td>PFD</td>
</tr>
</tbody>
</table>
Process-centric vs Swim Lane PFDs

Process-centric PFDs
- Fast & flexible
- Used to make improvement

Swim Lane PFDs
- Much slower to create
- Used to highlight functional responsibilities

Process Mapping - Preparation

Determine type of outcomes to be achieved, such as:
- Support process analysis
- Create or update inputs to Design or Process FMEA
- Internal Auditing
- Troubleshooting, problem-solving, root cause analysis
- Process design
- Process control

Identify the processes to be mapped
Determine process owners, scope and boundaries
Determine the level of detail needed & where detail is needed
Identify resources needed
Coordinate interviews and data collection / documentation
Obtain post-it notes, markers, flipchart pads, easels, clipboards & notepads as needed
Process Mapping - Execution

Meet with process owners and experts, as needed
Confirm process identity, scope and boundaries
Create a high-level BFD first if the process is complex to help:
- Determine process scope, process boundaries
- Identify major sub-processes
- Decide where to start
Documentation options
- Create a handwritten PFD during the interview
- Use a flipchart and Post-it Notes
- Collect examples of all forms, documents and records used by the process owners (and verify that your PFD incorporates references to these)
- Use Visio and a computer / projector
Verify completed PFDs with process owners as required

Identifying Potential Problem Areas

Complexity?
Rework loops?
Decision steps?
Hold steps?
End-of-the-line checking steps?
Any steps that don’t add value (as perceived by the customer)?
Standardized? Or are people working in different ways?
Steps repeated, or out of sequence?
Steps where errors occur frequently?
Process Flow Diagrams

Process flow diagrams
Process Flow Diagrams
Process Simplification

Current Process

Future State Process

PFD Individual Exercise

PART 1: (10 minutes)
- Select a sample process from the list we developed or any other process you want
- Individually diagram that process using the symbols and headings

PART 2: (10 minutes)
- Exchange your process diagram as instructed.
- Examine your partner’s diagram. You should be able to understand it simply by looking at the diagram.
Systems

Definition

A set of interacting processes

Systems can be created by design or by accident

Represented visually by diagrams
Interacting Processes

Process Flow Diagrams
Process Interfaces

All input and output ovals connect to other processes
Multiple and complex interfaces are common

Harmonization

The review, verification and modification of process flow diagrams to assure consistency across related processes
Requires all interfaces be identified

Is this output consistent with the input?
ISO System Model

Continual Improvement

Customer
- Requirements
- Product realization

Management responsibility
- Resource management

Measurement, analysis & improvement

Satisfaction

Customer

Products

Management System Documentation Structure

- Policies
- Procedures
- Work instructions
- Records
PFD Team Exercise

WHO:
- Break up into teams

WHAT:
- Each team to diagram the process flow(s) at the Pitts Warehouse.
- HINT: There is more than one process in this case
- Create high quality, clear PFDs on flipcharts
- Where in the PFD might you look for potential improvements?

WHEN:
- Take 60 minutes to do this

HOW:
- Appoint a spokesperson to present results to the group

The Pitts Warehouse

The Pitts Distribution Warehouse receives boxed non-perishable food and household items from suppliers all over the country. The boxes are received on wooden pallets and stored until smaller orders are prepared for shipment to the 26 local supermarkets in a three-county area. Overall, over 1000 items are routinely carried in inventory.

When goods are needed by the supermarket, they send a request to the warehouse. The order usually calls for less-than-pallet quantities. An Order Filler travels around the Warehouse on a small truck picking up whatever is asked for by the supermarket. A first-in / first-out method is used to move stock and each time an item is removed, the inventory count is reduced by that amount on a clipboard permanently stationed by each product location. Because of a significant increase in complaints from the supermarkets about order-filling errors, each shipment is physically reviewed by the Chief Warehouse Clerk before an order is shipped. When goods on pallets arrive from the supplier, the inventory count on the clipboard is increased by the amount received.

At 6:00 am each Friday morning, the Warehouse Clerks inventory each product by recording the clipboard numbers for each item. They then reconcile the inventory from the previous Friday by comparing inventories, receipts from suppliers, damaged goods inventory, and orders to the supermarkets. If the reconciliation differs by more than 2%, then a complete physical inventory (pallet-by-pallet, actual count) must be taken. If the reconciliation is still off by more than 2%, a Report of Non-Conformance is generated for the Warehouse Manager. During every-day operation, if boxes are found to be damaged, they are taken to a special area of the Warehouse for return shipment to the supplier. Each Friday, the Damaged Goods area is inventoried which is reconciled to the physical inventory.

Each inventory item has its own reorder quantity that is picked up by the Friday inventory. If an item is out-of-stock, the Order Filler completes an Out-of-Stock form for the Chief Warehouse Clerk who initials it and sends it to the supermarket with the rest of the order.
Team Exercise

Work in two person teams to create a PFD
- Process expert:
  • Select a simple work-related process from your job
  • Provide information on the process
- Interviewer:
  • Create a PFD based only on information provided by the process expert
  • Use flipchart
Post your flipchart on the wall
Take 30 minutes
Exchange roles and repeat this process to create a second PFD

PFD Process Summary

1. Identify the process.
2. Involve the people who work directly with the process.
3. Agree on process boundaries (input and output).
4. Agree on level of detail (it is preferable to begin with less detail & increase if needed).
5. Identify the steps and their sequence.
6. Construct the PFD using the standard symbols.
7. Analyze the PFD. Look for areas of possible improvement.
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Pitts Warehouse PFDs

Order filling

1. Supermarket orders
2. Order filler checks stock
3. Order in stock?
   - Y: Order filler reduces count on clipboard
   - N: Prepare out-of-stock card
4. Damaged goods?
   - Y: Send to Damaged goods section
   - N: Order filler reduces count on clipboard
5. Hold for head checker inspection
6. Order correct?
   - Y: Ship order to customer
   - N: Order in stock?

Each item inventory inputs

Receipts, orders, current stock, damaged goods

Inventory reconciliation

1. Previous week’s inventory
2. Compare & reconcile each item
3. Within 2%?
   - Y: Conduct physical inventory
   - N: Move to next item
4. Within 2%?
   - Y: Issue non-compliance plan
   - N: Move to next item

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