The Lean Enterprise

Value Stream Mapping
Overview

What is Value Stream Mapping?

Value Stream Mapping is a method of creating a "One page picture" of all the processes that occur in a company, from the time a customer places an order for a product, until the customer has received that product in their facility.

The goal is to depict material and information flows across and throughout all Value-Adding Processes required to produce and ship the product to the customer. Value Stream Maps document all of the processes used to produce and ship a product, both Value-Adding and Non-Value-Adding (Waste) processes.

Why Value Stream Map?

During the team creation of a Value Stream Mapping, business and manufacturing waste that occur in the processes can be easily identified.

Once the Current State Value Stream Mapping is created, it becomes the baseline for improvement and for the creation of a Future State Value Stream Mapping. The FSVSM can then be used as a World Class Manufacturing implementation road map.
I'm placing my order for a custom widget.

Customer places order over the internet, - 3 minutes -

Producer processes order, orders material from suppliers, - 15 minutes value-added, 2 weeks lead-time -

Supplier ships material, - 2 days in-transit time -

Production of custom widget, - 1 hour of value-added, 10 days queue time -

I finally got it! Why 30 days?

Customer receives product, - 30 days after order it -

Manufacturer ships widget, - 2 days in-transit time -

Inventory storage, packaging, shipping, - 10 minutes value-added, 2 days queue time -

100% Inspection, - 10 minutes each -

-Elapsed Time from Order to Delivery : 30 Days.-

-Value-Added Time : 1 Hour, 25 Minutes.-
Four Steps to Value Stream Mapping

1. **Define and Pick the Product or Product Family.**
2. **Create the "Current State" Value Stream Mapping (CSVSM).**
3. **Create the "Future State" Value Stream Mapping (FSVSM).**
4. **Develop an Action Plan to make the FSVSM the CSVSM.**
Step #1 – Define Product or Product Family

- Define Product, or
- Define Product Family.
  - Products Sharing Common Processes?
  - From Order Entry to Shipment.
  - Search for Commonality; Main Processes, Optional Processes, ...

<table>
<thead>
<tr>
<th>Description</th>
<th>Product</th>
<th>Product Family</th>
<th>Process</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>L101 Coils Bending</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Machine</td>
</tr>
<tr>
<td>TWK 530 NBL</td>
<td>22227777-000</td>
<td>1</td>
<td>X</td>
</tr>
<tr>
<td>TWK 530 NBL-OC</td>
<td>22227777-CDT</td>
<td>1</td>
<td>X</td>
</tr>
<tr>
<td>TWK 536 NBL</td>
<td>33338888-000</td>
<td>2</td>
<td>X</td>
</tr>
<tr>
<td>TWK 536 NBL-OC</td>
<td>33338888-CDT</td>
<td>3</td>
<td>X</td>
</tr>
<tr>
<td>TWK 048 NBL</td>
<td>44447777-000</td>
<td>2</td>
<td>X</td>
</tr>
<tr>
<td>TWK 048 NBL-OC</td>
<td>44447777-CDT</td>
<td>2</td>
<td>X</td>
</tr>
</tbody>
</table>
Step #2 – Create the "Current State" VSM

- Define the scope of the Value Stream Map.
  - Walk the process from end to end.
- Agree upon the symbols, icons, and data to use.
- Brainstorm an initial map.
- Determine missing information the VSM requires.
- Make assignments to gather and create information, "Go See" the process.
  - Collect as much information about causes of waste as possible.
- Build the Current State Value Stream Map (CSVSM).
- Make a list of "Lightning Bolts" of potential improvements.
Step #2 – Typical VSM Symbols

- **Customer or Supplier Plant**
- **Trucking and/or Logistics**
- **Lightening Bolt of Opportunity**
- **Peaople Operator**

- **Electronic Information Flow**
- **Inventory**
- **Push of Production**

- **“Go See”**
- **Tombstone Inventory Waste**
- **Information Flow**
- **Timeline of Value-Added Activities Vs. Non-Value-Added Activities**
Step #2 – Create the "Current State" VSM

Current State Map – 20 Days Lead-Time

Purchasing (2 Days)

Technical Services (2 Days)

Production Planning

Order Entry (2 Days)

Supervisor

Shipping Schedule

Orders

V/A Time = 20 Min 90 Min 30 Min 60 Min 45 Min 30 Min 300 Min 20 Min = 595 Min

Non V/A = 9 Days 3 Days 1 Day 4 Days 1 Day 1 Day 1 Day 1 Day = 20 Days

Value Added Time as a % of Total Time in Plant = \( \frac{595 \text{ Minutes}}{(20 \text{ Day}) (24 \text{ Hours/Day}) (60 \text{ Minutes/Hour})} = 2.1\% \)
Step #3 – Create the "Future State" VSM

Future State Map – "Green Cell Team" – 5 Days or Less Lead-Time

- **Purchasing**: New
- **Technical Services**: New
- **Production Planning**: Repeat
- **Order Entry**: New
- **Estimating**: Quote
- **Shipping**: Orders
- **Client**: 2 Hours

### Work Order – Repeat
- **Shear**: 10 Min Setup, 1 Person, 20 Min
- **Punch**: 14 Items
- **Debur**: 3 Items
- **Form Break**: 13 Items
- **Clean**: 14 Items, 45 Min
- **Assembly**: 1 Person, 60 Min

### Green Cell Team, One Part = 6.75 Hours Plus Assembly
- **Paint Prime**: 1 Person, 30 Min
- **Air Dry**: 300 Min
- **Shipping**: 3 People, 20 Min

### Value Added Time as a % of Total Time in Plant
\[
\text{Value Added Time as a % of Total Time in Plant} = \frac{595 \text{ Minutes}}{(24 \text{ Hours/Day}) (60 \text{ Minutes/Hour}) + 780 \text{ Min}} \times 100 = 26.8\%
\]

### Raw Material
- Raw Material Supplier
- Hardware Supplier

**Kanban**

**V/A Time** = 20 Min, 90 Min, 30 Min, 60 Min, 45 Min, 30 Min, 1 Day

**Non V/A** = 35 Min, 60 Min, 15 Min, 75 Min, 1 Day

**Total Time in Plant** = 1 Day, 780 Min
Step #4 – From "CSVSM" to "FSVSM"

- An initial "Kick Off" event involving all stakeholders is recommended.
  - Everyone can be informed on what was learned in the process, and what we will be doing about it in a non-threatening manner.
- Schedule regularly meetings for all participants.
- Teams need a structure to work on problem solving and to complete tasks.
  - Progress on goals and support for the process needs to be verified continuously.
  - Information on progress needs to be collected and periodically reviewed with top management.
- Teams created to work on various improvements may or may not include members of the Value Stream Mapping Team. The emphasis should be on putting the right members on a team to complete various projects.
- ...

Ph. Magnier - 31/01/2003 - Release Org
Step #4 – From "CSVSM" to "FSVSM"

- ...  
- Initially, great care is needed to ensure that teams are supported with a skilled facilitator and the resources to meet the goals.
- Ongoing communications on progress needs to be continuously reinforced.
  - Monthly "all hands" meetings along with posted information during each month can be an effective way to ensure good communications with all involved.
- Implement a "Top-Level Report-Out" for the entire company.
  - Post in a conspicuous place three Value Stream Maps:
    - The Original Current State.
    - The Desired Future State.
    - The "Virtual" Current State – Where the team stands now.
- A simple and visual comparison of the three value stream maps can speak progress!
Recommended Reading and Software

- "Learning to See" by Mike Rother and John Shook.
- eVSM 2002 Software.
  - The Lean Institute.
  - Web Site: www.lean.org

- The Lean Enterprise Memory Jogger.
  - GOAL/QPC – 2 Manor Parkway, Salem, NH 03079-2841
  - Web Site: www.goalqpc.com