Value Stream Mapping For Transactional Processes

A METHODICAL APPROACH TO IMPROVE VALUE STREAMS
Value Stream Mapping

How Do I Get Started With VSM?

<table>
<thead>
<tr>
<th>Action</th>
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Ground Rules For Event

- Safety First (Use Personal Protective Equipment)
- Active Participation By All
- Start And End On Time
- All Electronic Gadgets (Phones, Pagers, Etc.) Turned To “Off” Or “Silent”
- Computers To Be Used Only When Instructed
- Keep An Open Mind To Change
- Don’t Let “Perfect” Get In The Way Of “Better”
- Reach For The Mind Before The Wallet
11 Kaizen Commandments


4. Don’t Seek Perfection. A 50% Implementation Rate Is Fine As Long As It Is Done On The Spot.

5. Correct Mistakes The Moment They Are Found.
6. Think Creativity Before Capital. If You Have To Spend Money On Improvements, Simulate It First.

7. Problems Give You A Chance To Use Your Brain.

8. Ask “Why” Five Times. Then Ask Any And All Other Questions – There Are No Dumb Questions.

9. Leave Titles At The Door – One Person, One Voice, No Position Or Rank. Ten Persons’ Ideas Are Better Than One Person’s.

10. Improvements Know No Limits.

11. Don’t Fool Yourself!
Value Stream Mapping Defined

VSM Is A Snapshot Of All Actions Both Value Added And Non-value Added Required To Bring A Product Or Service Through The Main Material And Information Flows

Key Characteristics
- VSM Is A Graphical Representation That Uses A Common Mapping Language
- VSM Provides The Basis And Direction For Identifying Improvement Opportunities
- The Power Is In The Plan!

Components
- Current State Value Stream Map
- Mark-up Of Current State Value Stream Map
- Future State Value Stream Map
- Value Stream Plan
Value Stream Map And Process Map Distinction

VALUE STREAM MAP
• Detailed Graphical Depiction Of A Manufacturing Or Business Process
• Used To Identify Specific Improvements
• Incorporates Decision Loops Within The Process
• High-level Snapshot Of End-to-end Business
• Used To Identify Where Opportunities For Improvement Exist
• Does Not Incorporate Decision Loops

PROCESS MAP
To Effectively Use Of The Value Stream Mapping Tool And Method To Clearly Identify Waste In Key End-to-end Manufacturing And Business Processes, And Create An Executable Transformation Plan.

Benefits
- Focuses Limited Resources
- Establishes Timeline For Expected Performance Improvements
- Avoids Creating Islands Of Success In A Sea Of Waste
- Allows Everyone Gain A Common Understanding Of The Current State And The Future Vision

When To Use
- To Provide Direction For Getting Started On The Lean Journey
- To Execute Improvements Driven By Strategy Deployment And Key Business Imperatives
- To Gain True Cross-functional Understanding The End-to-end Process
Value Stream Mapping Roadmap to Success

Repeat For Each Identified Value Stream

PROCESS STEP 1

Site Assessment

- Complete Intro To Lean
- Identify Strategic Value Streams And Product Families
- Plan VSM Events

PROCESS STEP 2

VSM Event Preparation

- Select Sponsor, VSM Leader, & Team
- Select Value Stream And Product Family
- Collect Value Stream Data
- Plan Logistics For VSM Event

PROCESS STEP 3

Conduct VSM Event

- Current State VSM
- Future State VSM
- Transformation Plan Complete

PROCESS STEP 4

Implement VS Plan

- Plan Kaizen Events That Link To Transformation Plan
- Train Kaizen Teams
- Conduct Kaizen Events And Measure Results
- Manage Results

Repeat
Value Stream Mapping Process

Repeat For Each Identified Value Stream

PROCESS STEP 1
Site Assessment

PROCESS STEP 2
VSM Event Preparation

PROCESS STEP 3
Conduct VSM Event

PROCESS STEP 4
Implement VS Plan

Repeat Cycle

Pre-event Work
Select Product Or Service Family

Create Current State Map

ID Improvements To The Current State

Create Future State Map

Develop Transformation Plan
Pre-Event Work
Pre-Event: Create VSM Kaizen Charter

As A Team Answer:

- Why Are We Doing This Event?
- Define “Value Stream”
- Identify The Customer
- Clearly Identify The Product Or Service Family: VALUE OBJECT
- Volume Analysis: What Is The Demand For Each Product Or Service And For The Product Family As A Whole?
- Determine & Validate Value Stream Map Boundaries
- What Are The Sources Of Information That Support The Value Object As It Moves Through The Stream?
- Collect Relevant Information
The Transactional Value Stream Defined

Definition:

- A Graphical Picture Of All Of The Actions (Both Value Added And Non-value Added) Required To Bring A Product / Service (Product / Service Family) From Inception To The Customer
- Looks At The Product / Service Flow And Information Flow
- Cross Function And Organization Boundaries
- Current State And Future States Are Developed
- Used To Identify Key Areas For Kaizen Opportunities
Identifying The **VALUE Product Or Service Family** Within The Value Stream

<table>
<thead>
<tr>
<th><strong>PRODUCT or SERVICE</strong></th>
<th><strong>TYPICAL VALUE OBJECT</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumer Credit</td>
<td>Credit Card Application</td>
</tr>
<tr>
<td>Proposal</td>
<td>Request for Proposal (RFP) → Quote Document</td>
</tr>
<tr>
<td>Engineering Change</td>
<td>Engineering Change Request (ECR) → Engineering Change Order (ECO)</td>
</tr>
</tbody>
</table>

- **The VALUE OBJECT Is:**
  - A Single Physical, Service Or Informational Object That Follows All Of The Process Steps Within The Value Stream From Inception To Receipt By Customer
  - Used To Follow The Value Stream As It Is Mapped And To Calculate The Inventory Levels At Each Process
  - Used To Demonstrate How Value Is Added As It Moves Through Its Processes To The Customer
The **VALUE Product Or Service Family Analysis**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Quantity</th>
<th>% of Total</th>
<th>Receive Order</th>
<th>Write Down Order</th>
<th>Plant Order Review</th>
<th>Enter Order</th>
<th>Maintain Order</th>
<th>Quote Request</th>
<th>Generate Quote</th>
<th>Check Credit</th>
<th>Return Request</th>
<th>Authorize Return</th>
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</thead>
<tbody>
<tr>
<td>Order Entry</td>
<td>339,103</td>
<td>48%</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Request for Quote</td>
<td>202,464</td>
<td>29%</td>
<td>1</td>
<td>2</td>
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<td></td>
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<tr>
<td>Order Status</td>
<td>122,098</td>
<td>17%</td>
<td>1</td>
<td></td>
<td></td>
<td>2</td>
<td></td>
<td></td>
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<tr>
<td>Expedite Order</td>
<td>35,445</td>
<td>5%</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
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<tr>
<td>Return Authorization</td>
<td>3,022</td>
<td>0%</td>
<td>1</td>
<td></td>
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<td></td>
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<tr>
<td>Credit Request</td>
<td>2,897</td>
<td>0%</td>
<td>1</td>
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<tr>
<td><strong>Total</strong></td>
<td>705,029</td>
<td>100%</td>
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**Information To Record:**

- Process Name & Description
- Number Of Steps Within Activity
- Demand For Each Activity - Quantity & Frequency
Identify “Who is the Customer”

- When Mapping Transactional Processes There Are Many Times That The End Customer Is Not The Actual “Purchaser” Of The Final Product Or Service
- The Customer Would Be Defined In This Case As The Individual, Function, Team, Or Organization “Receiving Or Getting The Benefit From” The Output Of The Process To Be Mapped
- It Is Important To Know Who Our Customer Is So That We Can Identify What They Consider To Be Value-added Activity In This Process
## Completing Customer Analysis

<table>
<thead>
<tr>
<th>Customer/Stakeholder</th>
<th>Reason They Are A Customer / Stakeholder</th>
<th>What They Value From The Process</th>
<th>Primary Customer “X”</th>
</tr>
</thead>
<tbody>
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Complete Customer / Stakeholder Analysis Of The Process To Be Mapped.

Instructions
As A Team, Use The Chart On The Previous Slide To Make A List Of:
1. The Customers And Stakeholders Of This Process
2. Why They Are A Customer Or Stakeholder
3. What Is The Value They Are Looking For
4. Determine Who Is The Primary Customer
5. Put Answers On A Flip Chart

Time To Complete
30 minutes

Deliverable
Completed listing.
## Value Stream Mapping Session Agenda

<table>
<thead>
<tr>
<th>Day</th>
<th>Key Actions</th>
<th>Daily Deliverables</th>
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</thead>
<tbody>
<tr>
<td>Day 1</td>
<td>▪ Introductions</td>
<td>▪ Current State Process Walk</td>
</tr>
<tr>
<td></td>
<td>▪ Review Pre-Work</td>
<td>▪ Labeling of Process Boxes on Current State Map</td>
</tr>
<tr>
<td></td>
<td>▪ Current State Mapping</td>
<td>▪ Current State Map with Complete Data</td>
</tr>
<tr>
<td></td>
<td>▪ Conduct Data Gathering For Current State Map For Business</td>
<td>▪ Current State Report-Out to Management</td>
</tr>
<tr>
<td>Day 2</td>
<td>▪ Identify Potential Current State Improvements</td>
<td>▪ Completed Marked-Up Current State Map With Kaizen Bursts</td>
</tr>
<tr>
<td></td>
<td>▪ Future State Mapping</td>
<td>▪ Completed Future State Map</td>
</tr>
<tr>
<td></td>
<td>▪ Completing the Value Stream Plan</td>
<td>▪ Complete Value Stream Plan</td>
</tr>
<tr>
<td>Day 3</td>
<td>▪ Continue if needed</td>
<td></td>
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</tbody>
</table>
Create Current State Map
Team Walk #1: Process Identification

- Everyone Initially Should Create Their OWN Map
- Walk The Entire Process First To Record Process Flow
- Begin At End Point And Proceed In Reverse Flow
- Draw Map Of Process Using Pencil And Paper

Team Walk #2: Data Gathering

- Decide What Data Will Be Collected For Each Process
- Walk Reverse Flow Again And Collect Data And Information Flow
- Use Actual, Observed Data Wherever Possible
- Use Smallest Time Units Whenever Possible – Be Consistent

Map Creation

- Consolidate Individual Maps Into A Single Map By Consensus Of The Team
- Use Post-it Notes To Facilitate Any Necessary Changes
- Review Map As A Team To Ensure Accuracy And Validate Flow
Items Found On A VSM

COMPONENTS
• Customer Data
  • Customer Requirements
  • Demand / Takt Time
• Company Data
  • Company Work Time
• Process Data
  • Process Steps
  • Data Box For Each Step
  • Observed Inventory Levels Between Steps
• Information Flow
• Lead Times And Processing Times

Data Box
• Quality Metric
• Process Time

Definitions
• Takt Time - How often should one product be produced, based on the rate of sales to meet customer requirements.
• Processing Time - The time it takes for a single product or service to go completely through a process
• First Pass Yield - The percentage of time that the process can be successfully completed on the first attempt using the standard process, tools, personnel, and information all at the right time and in the right place
Calculating Lead Time For Each Process

- Divide The Amount Of Inventory By The Daily Demand To Derive Lead Time For That Process

Daily Demand = 125 applications

Takt Time
27,000 Seconds 
125 Applications = 216 seconds

- Receipt: 75/125 = .6 days
- Data Entry: 200/125 = 1.6 days
- Underwrite: 500/125 = 4 days
- Generate Package: 0/125 = 0 days
- Mail Package: 75/125 = .6 days

Add Processing Times And Lead Times For Each Process To Derive The Totals For The Value Stream
Loan Applicant Example

- Demand = 2,500 Accounts/month
- 8 Hours/Day

Takt Time
- 27,000 Seconds = 216 seconds
- 125 Applications

Current State Example

Central Data Base
Credit Check

Receipt
Processing Time = 3 days
DOI = 8
Quality = 100%

Data Entry
Processing Time = 780 seconds
DOI = 388
Quality = 36%

Underwrite
Processing Time = 720 seconds
DOI = 420
Quality = 97%

Generate Package
Processing Time = 45 seconds
DOI = 45
Quality = 100%

Mail Package
Processing Time = 45 seconds
DOI = 45
Quality = 100%

P.T = 1,980 sec
L.T. = 6.8 days

IN
Mailbag
FIFO
75 Packages

IN
Receipt
FIFO
75 Envelopes

IN
Data Entry
FIFO
500 Files

IN
Underwrite
FIFO
500 Files

IN
Generate Package
FIFO
50 Files

IN
Mail Package
FIFO
5 Packages

IN
Credit Check
FIFO
500 Files

IN
Central Data Base
FIFO
500 Files

Mail
Package
FIFO
1,250 Packages

IN
Credit Check
FIFO
500 Files

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Underwrite
FIFO
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Generate Package
FIFO
50 Files

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Mail Package
FIFO
5 Packs
Supplies For The Current State Process Walk

- All Team Members Will Require:
  - Personal Protective Equipment (PPE) Required By Facility
  - 11x17” Paper
  - Clipboard
  - Icon Sheet
  - Completed Current State Map Example Drawn In Class
  - Pencil
  - Two Stopwatches Needed Per Team
Current State Map: Team Walk #1 - Process Identification

- Everyone Initially Should Create Their OWN Map
- Walk The Entire Process First To Record Process Flow
- Begin At End Point And Proceed In Reverse Flow
- Draw Map Of Process Using Pencil And Paper
Current State Map: Team Walk #2 – Data Gathering

- Decide What Data Will Be Collected For Each Process
- Walk Reverse Flow Again And Collect Data And Information Flow
- Use Actual, Observed Data Wherever Possible
- Use Smallest Time Units Whenever Possible – Be Consistent

Roles / Assignments

2. Interviewer - Leads The Interview With The Operators/Process Participants
3. Timer - Records All Actual Operator Cycle Times, Machine Cycle Times, And Drop Off Intervals
4. Inventory Counter - Counts Number Of Pieces Queued At Each Process
Key Interviewer Guideline Questions

- Introduce The Team And Remind The Operator About The Exercise We Are Performing
- Determine Which Scripted Questions Are Appropriate For Process Observed
- Determine If There Are Any Other Relevant Questions That Need To Be Asked
- Thank The Operator For His / Her Time
First Try To Observe The Process Firsthand In The Workplace

When That Is Not Possible, Continue To Follow This Sequence In Order To Obtain Necessary Data

Always Want To Start With Data First

Be Cautious When Using The Interview Method As It Tends To Yield Highly Inaccurate Data
Current State Map: Map Creation

- Consolidate Individual Maps Into A Single Map By Consensus Of The Team
- Use Post-it Notes To Facilitate Any Necessary Changes
- Review Map As A Team To Ensure Accuracy And Validate Flow
- Report-out To Management
Identify Improvements To The Current State
Identify Potential Current State Improvements

Some Potential Questions To Ask

• Is The Current Process Producing To Takt Time?
• Which Processes Can Be Coupled Using Continuous Flow?
• Where Can Visually Managed Queues Couple Processes?
• Where Are Manpower Improvement Opportunities?
• Which Processes Need Quality Improvements?
• What Other Information Flow Improvements Are Required?
• What Other Process Improvements Are Required?
• Look For Overproduction And “Push” Processes, Impediments To Flow
• Where Is Inventory Accumulating?
• Is The Poor Quality In Certain Areas Due To Lack Of Standard Work?
Identify Potential Current State Improvements

- 8 Wastes
- Value Stream Concepts
Guidelines For Marking Up Current State Map

- Based On Lean Principles, Mark-up The Current State Map
- Discuss Each Improvement Opportunity As A Team
- Entire Team Should Be Engaged
- “Validate” Assumptions And Gather Any Additional Data – Review With Stakeholders
- VSM Is The “Big Picture” – Enough But Not Too Much Detail
- Be Thorough - The Marked-up Map Will Be The Basis For Creating The Future State Map

Now You Are Ready To Create The Future State
Create The Future State Map
Purpose Of A Future State Map

- It Forms The Basis Of An Implementation Plan Towards A Lean Production System
- It Forms A Stream Of Value-adding Flow Linked To The Customer By Pull Or Continuous Flow
- It Allows For The Team’s Full Participation And Commitment In Implementing The Future Vision Of The Business. The Framework Of The Future Vision Addresses:
  - What Kind Of Facility Do We Want It To Be?
  - What Will Ensure Customer Satisfaction?
  - What Do We Want Our Customers To Say About Us?
  - Does Our Vision Align To The Company Business Goals?
Future State Key Questions

- What Is The Takt Time?
- Where Do You Use Continuous Flow?
- Where Do You Need Pull Systems?
- At Which Single Point (Pacemaker) Will You Schedule Production?
  - How Will You Level The Production Mix?
  - What Increment Of Work Will Be Released & Withdrawn At Pacemaker?
- What Process Improvements Are Required As Future State Dictates?
- What Constraints (I.E. Equipment/Financial/Time) Do You Need To Consider?
- In The Future State, Work To Fix The **Root Causes** Of Waste, Not Just The Symptoms.
Steps For Creating The Future State

- Start With The Marked Up Current State Map
- Draw The Pieces Of The Map That Are The Same
- Combine Processes That Flow
- Implement Visually Managed Queues Between Areas Of Flow
- Calculate Lead Time And Processing Time
- Identify Loops On The Map
Northern Home Credit (NHC)

- Demand = 2,500 Accounts/month
- 8 Hours/Day

Takt Time
27,000 Seconds
25 Applications

- 216 seconds

Central Data Base

24 packages/day

Mail Package

USPS Daily

USPS Daily

Draw The Pieces Of The Map That Are The Same
Combine Processes That Flow

- Combine Process Boxes
- Total The Number Of Operators
- Total The Process Times
- Record Expected Drop Off Rate
- When Combining Two Processes Multiply The Quality Yields If No Improvement Activity Is Needed
Implement Visually Managed Queues

- Establish Upper Size Limits For Visually Managed Queues
- Note: Batch Timing, Resources, Capacity, And Flow Will Drive Queue Sizes
- Calculate Lead Times Based On Upper Size Limit Of Queue (Based On Buffer Theory The Queue Will Average 1/2 Full ~ 32 Envelopes)
- Use The Queue Size And Status To Manage Staffing For Mail Reception

**Northern Home Credit (NHC)**

- **Takt Time**
  - 27,000 Seconds
  - 25 Applications
  - \( \frac{27,000 \text{ Seconds}}{25 \text{ Applications}} = 216 \text{ seconds} \)

**USPS Daily**

- **Target Lead Time** Established by Policy at 1 day.

**Receipt**
- \( \text{DOI} = 1 \)
- Processing Time = 15 sec
- Quality = 100%

**Data Entry & Underwrite**
- \( \text{DOI} = 7 \)
- Processing Time = 1,500 sec
- Quality = 98%

**Generate Package**
- \( \text{DOI} = 1 \)
- Processing Time = 420 sec
- Quality = 97%

**Mail Package**
- \( \text{DOI} = 1 \)
- Processing Time = 45 sec
- Quality = 100%

**Mail Bag**
- \( \text{DOI} = 32 \) Packages
- Processing Time = 45 sec

**Envelopes**
- \( \text{DOI} = 32 \) Packages

**24 packages/day**

- 25 days
- 15 sec
- .5 day
- 1,500 sec
- 0 day
- 420 sec
- .25 days

**Target Lead Time** Established by Policy at ½ day.
Calculate Lead Time And Processing Time

Northern Home Credit (NHC)

- Demand = 2,500 Accounts/month
- 8 Hours/Day

**Takt Time**
- 27,000 Seconds
- 25 Applications
- Takt Time = 216 seconds

**USPS Daily**

**Receipt**
- Processing Time = 15 sec
- Quality = 100%
- Mail Bag FIFO 32 Envelopes
- = 1

**Data Entry & Underwrite**
- Processing Time = 1,500 sec
- Quality = 98%
- Box FIFO 62 Applications
- = 7

**Generate Package**
- Processing Time = 420 sec
- Quality = 97%
- Box FIFO 50 Packages
- = 1

**Mail Package**
- Processing Time = 45 sec
- Quality = 100%
- = 1

**Central Database**

**Loan Applicant**

- USPS Daily

**Mail Bag**

- FIFO
- 32 Envelopes

**Receipt**

- = 1

**Data Entry & Underwrite**

- = 7

**Generate Package**

- = 1

**Mail Package**

- = 1

**In Box Zip Code**

- 32 Packages

**In Box FIFO**

- 63 Applications

**In Box FIFO**

- 0 Applications

**In Box FIFO**

- 24 packages/day

**In Box FIFO**

- .25 days

**In Box FIFO**

- 15 sec

**In Box FIFO**

- .5 day

**In Box FIFO**

- 1,500 sec

**In Box FIFO**

- 0 day

**In Box FIFO**

- 420 sec

**In Box FIFO**

- .25 days

**In Box FIFO**

- 45 sec

**In Box FIFO**

- L.T. = 1 day

**In Box FIFO**

- P.T = 1,980 seconds
Identifying “Loops”

- A “Loop” is a logical grouping of improvements to be made to the current state in order to achieve the future state.
- Loops are used to link focus improvement activities in the value stream plan in a manner around a particular new capability in the future state.
- Loops are used to logically sequence improvement activities in the value stream plan so that the future state is achieved through incremental phased implementation vs. “Big Bang” (everything at once).
Identifying “Loops”

Northern Home Credit (NHC)

- Demand = 2,500 Accounts/month
- 8 Hours/Day

**Takt Time**

27,000 Seconds

25 Applications

≈ 216 seconds

**Application Loop**

- Receipt
  - Mail Bag
    - FIFO
      - 25 Applications
        - 25 days
        - 15 sec

- Data Entry & Underwrite
  - Processing Time = 1,500 sec
    - Quality = 98%
  - Data Entry & Underwrite
    - Processing Time = 420 sec
    - Quality = 97%

- Generate Package
  - Processing Time = 45 sec
  - Quality = 100%

- Mail Package
  - Processing Time = 45 sec
  - Quality = 100%

**Decision Loop**

- Central Data Base
  - 24 packages/day
  - 24 Packages
  - FIFO
  - 63 Applications

**Communication Loop**

- USPS Daily
  - L.T. = 1 day
  - P.T = 1,980 seconds

- In Box
  - FIFO
  - 32 Packages
  - FIFO
  - 0 Applications

- In Box
  - FIFO
  - 32 Envelopes
  - FIFO
  - 63 Applications

- In Box
  - FIFO
  - 0 Applications
  - FIFO

- In Box
  - FIFO
  - 0 Applications
Develop Transformation Plan
Purpose Of The Transformation Plan

- Establishes Priority
- Clearly Identifies Actions
- Details Rigorous Timeline
- Clearly Identifies Ownership
- CREATES A PLAN TO ACHIEVE FUTURE STATE
## Completed Value Stream Plan

### Value Stream Plan

<table>
<thead>
<tr>
<th>VS Loop</th>
<th>Value Stream Objective</th>
<th>Goal (measurable)</th>
<th>Monthly Schedule</th>
<th>Target Date</th>
<th>Person in charge</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application</td>
<td>1. Establish incoming application visually managed queue</td>
<td>Incoming applications wait no more than 1/2 day for processing</td>
<td>O    D    J    F  M  A  M  J  J  S</td>
<td>02/01/07</td>
<td>Facilities Director</td>
<td></td>
</tr>
<tr>
<td>Receipt</td>
<td>2. Implement Staffing Playbook</td>
<td>Staff receiving to match DOR with Takt Time, 1 person</td>
<td>O    D    J    F  M  A  M  J  J  S</td>
<td>03/31/07</td>
<td>Receiving Manager</td>
<td></td>
</tr>
<tr>
<td>Decision</td>
<td>3. Establish received application visually managed queue</td>
<td>Applications underwritten within 1 day of receipt</td>
<td>O    D    J    F  M  A  M  J  J  S</td>
<td>04/15/07</td>
<td>Receiving Manager</td>
<td></td>
</tr>
<tr>
<td>Decision</td>
<td>4. Merge Data Entry &amp; Underwriting</td>
<td>Create continuous flow, eliminate queue</td>
<td>O    D    J    F  M  A  M  J  J  S</td>
<td>05/01/07</td>
<td>Head of Underwriting</td>
<td></td>
</tr>
<tr>
<td>Communication</td>
<td>5. Establish visually managed queue after Poka Yoke underwriting</td>
<td>Applications underwritten within 1 day of receipt</td>
<td>O    D    J    F  M  A  M  J  J  S</td>
<td>12/01/08</td>
<td>Head of Underwriting</td>
<td></td>
</tr>
<tr>
<td>Communication</td>
<td>6. Poka Yoke underwriting information flow</td>
<td>Improve FPY from 35% to 95%</td>
<td>O    D    J    F  M  A  M  J  J  S</td>
<td>02/01/07</td>
<td>Head of Underwriting</td>
<td></td>
</tr>
<tr>
<td>Communication</td>
<td>7. Implement Staffing Playbook</td>
<td>Staff data entry &amp; underwriting to match DOR with Takt Time, 7</td>
<td>O    D    J    F  M  A  M  J  J  S</td>
<td>01/15/07</td>
<td>Head of Underwriting</td>
<td></td>
</tr>
<tr>
<td>Communication</td>
<td>8. Implement data entry / underwriting cross training</td>
<td>Maintain DOI of less than 216 seconds</td>
<td>O    D    J    F  M  A  M  J  J  S</td>
<td>04/01/07</td>
<td>HR Director</td>
<td></td>
</tr>
<tr>
<td>Communication</td>
<td>9. Establish feedback loop from mail</td>
<td>All packages mail the same day they are decided</td>
<td>O    D    J    F  M  A  M  J  J  S</td>
<td>03/01/07</td>
<td>Facilities Director</td>
<td></td>
</tr>
<tr>
<td>Communication</td>
<td>10. Establish Underwriting visually</td>
<td>Maintain continuous flow from underwrite to package generation</td>
<td>O    D    J    F  M  A  M  J  J  S</td>
<td>02/15/07</td>
<td>Facilities Director</td>
<td></td>
</tr>
<tr>
<td>Communication</td>
<td>11. Establish package visually managed</td>
<td>All packages mail the same day they are decided</td>
<td>O    D    J    F  M  A  M  J  J  S</td>
<td>01/15/07</td>
<td>Facilities Director</td>
<td></td>
</tr>
<tr>
<td>Communication</td>
<td>12. Establish auto rejection notification</td>
<td>0 rejection notices to package generation</td>
<td>O    D    J    F  M  A  M  J  J  S</td>
<td>01/15/07</td>
<td>IT Director</td>
<td></td>
</tr>
</tbody>
</table>

### Signatures

<table>
<thead>
<tr>
<th>Role</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEO</td>
<td>Karl Kaizen</td>
</tr>
<tr>
<td>V.S. Mgr</td>
<td>Monica</td>
</tr>
<tr>
<td>Bus. Unit Owner</td>
<td></td>
</tr>
</tbody>
</table>
## The Value Stream Plan

<table>
<thead>
<tr>
<th>VS Loop</th>
<th>#</th>
<th>Value Stream Objective</th>
<th>Goal (measureable)</th>
<th>Monthly Schedule</th>
<th>Target Date</th>
<th>Person in charge</th>
<th>Status</th>
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<tbody>
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<td></td>
</tr>
</tbody>
</table>

### Signatures

- **CEO**
- **V.S. Mgr**
- **Ops Mgr**
Transformation Action Plan Follow Up And Monitoring

- Follow-up & Monitoring Is Crucial To Success
- What Does Not Get Followed Up On – Does Not Get Done
- Conduct Regular Progress / Status Reviews With Value Stream Manager, Owner, & Upper Management
Roles In VSM

- **Leadership**
  - Define And Communicate The Long-term “Vision”
  - Identify & Prioritize Key Value Streams To Be Addressed By The Business
  - Provide Sponsorship And Support For VSM Events And Implementation

- **Value Stream Manager - Business Process “Owner”**
  - “Owns” The Value Stream Plan
  - Responsible For Overseeing Transformation Plan
  - Provides Leadership In Resolving Issues And Removing Obstacles
  - “Owns” The Operational Aspects Of The End-to-end Process, Even If It Crosses Organizational Boundaries
  - Continues The VSM Process Through The Second And Subsequent Cycles
  - Maintains The Linkage Between VSM And Strategic Vision Of The Business
When The Future State Becomes A Reality, It Becomes Our Current State

We Are Only At The Beginning Of Our Continuous Improvement Journey

Strive For Perfection!
Appendix - Icons
<table>
<thead>
<tr>
<th>VSM Icon</th>
<th>Represents</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASSEMBLY</td>
<td>Manufacturing Process</td>
<td>One Process Box Equals An Area Of Flow. All Processes Should Be Labeled. Also Used Departments, Such As Production Control.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Supermarket</td>
<td>A Controlled Inventory Of Parts That Is Used To Schedule Production At An Upstream Process</td>
</tr>
<tr>
<td></td>
<td>Withdrawal</td>
<td>Pull Of Materials, Usually From A Supermarket</td>
</tr>
<tr>
<td></td>
<td>Transfer Of Controlled Quantities Of Material Between Processes In A “First-in-first-out” Sequence.</td>
<td>Indicates A Device To Limit Quantity And Ensure FIFO Flow Of Material Between Processes. Maximum Quantity Should Be Noted</td>
</tr>
<tr>
<td>VSM Icon</td>
<td>Represents</td>
<td>Notes</td>
</tr>
<tr>
<td>----------</td>
<td>---------------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>![Water Spider Icon]</td>
<td>Water Spider</td>
<td>Represents A Person Who Replenishes Point Of Use Materials</td>
</tr>
<tr>
<td>![Air Shipment Icon]</td>
<td>Air Shipment</td>
<td>Note Frequency Of Shipments</td>
</tr>
<tr>
<td>![Transport Kanban Icon]</td>
<td>Transport Kanban</td>
<td>Card Or Device That Instructs The Material Handler To Get And Transfer Parts</td>
</tr>
<tr>
<td>![Signal Kanban Icon]</td>
<td>Signal Kanban</td>
<td>The “One-per-batch” Kanban. Signal When A Reorder Point Is Reached And Another Batch Needs To Be Produced</td>
</tr>
<tr>
<td>VSM Icon</td>
<td>Represents</td>
<td>Notes</td>
</tr>
<tr>
<td>----------</td>
<td>-----------</td>
<td>-------</td>
</tr>
<tr>
<td></td>
<td>Pull-ball (Now)</td>
<td>Gives Instruction To Immediately Produce A Predetermined Type And Quantity</td>
</tr>
<tr>
<td></td>
<td>Sequenced Pull (In Advance)</td>
<td>Gives Instruction To Begin To Produce, At A Certain Time In Advance, A Predetermined Type And Quantity</td>
</tr>
<tr>
<td></td>
<td>Kanban Post</td>
<td>Place Where Kanban Are Collected And Held For Conveyance</td>
</tr>
<tr>
<td></td>
<td>Information</td>
<td>Describes An Information Flow</td>
</tr>
<tr>
<td>Weekly Schedule</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**VSM Icons**

- **VSM Icon**: Represents
- **Notes**: Gives Instruction To Immediately Produce A Predetermined Type And Quantity
- **Sequenced Pull (In Advance)**: Gives Instruction To Begin To Produce, At A Certain Time In Advance, A Predetermined Type And Quantity
- **Kanban Post**: Place Where Kanban Are Collected And Held For Conveyance
- **Information**: Describes An Information Flow

---
<table>
<thead>
<tr>
<th>VSM Icon</th>
<th>Represents</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="img" alt="production_ Kanban" /></td>
<td>Production Kanban (Dotted Line Indicates Kanban Path)</td>
<td>The “One-per-container” Kanban. Card Or Device That Tells A Process How Many Of What Can Be Produced And Gives Permission To Do So</td>
</tr>
<tr>
<td><img src="img" alt="kanban_arriving_in_batches" /></td>
<td>Kanban Arriving In Batches</td>
<td>When Kanban Arrive In Batches To Allow Supplier Process To Combine To Optimize Set-ups.</td>
</tr>
<tr>
<td><img src="img" alt="load_leveling" /></td>
<td>Load Leveling</td>
<td>Tool To Intercept Batches Of Kanban And Level The Volume And Mix Of Them Over A Period Of Time</td>
</tr>
<tr>
<td><img src="img" alt="go_see" /></td>
<td>“Go See” Production Scheduling</td>
<td>Adjusting Schedules Based On Checking Inventory Levels</td>
</tr>
<tr>
<td>VSM Icon</td>
<td>Represents</td>
<td>Notes</td>
</tr>
<tr>
<td>----------</td>
<td>------------</td>
<td>-------</td>
</tr>
</tbody>
</table>
| Receipt | Process | - One Process Box Equals An Area Of Flow  
- All Processes Should Be Labeled  
- Also Used For Departments Such As Production Control |
| ![Outside Sources Icon] | Outside Sources | - Used To Show Customers, Suppliers And Outside Manufacturing Processes  
- For Project-based Maps, Could Depict The Start And End Of The Process |
| ![Data Box Icon] | Data Box | - Used To Record Information Concerning A Process, Department, Customer, Etc. |
| ![Inventory Icon] | Inventory | - Count And Time Should Be Noted |

**Quality**

- Quality = 100%

**Processing Time**

- Processing Time = 15”

**DOI**

- DOI = 8”

**IN**

- Quality = 100%
<table>
<thead>
<tr>
<th>VSM Icon</th>
<th>Represents</th>
<th>Notes</th>
</tr>
</thead>
</table>
| ![Arrow Icon] | Movement of output to the Customer | - Usually Connects The Last Process On The Map To The Customer  
- Usually Connects “Inception Point” To The First Process On The Map |
<p>| ![Dashed Arrow Icon] | Movement of VALUE OBJECT by push | - VALUE OBJECT Is Produces And Pushed Forward Before The Next Process Step Needs It – Usually Based On A Schedule |
| ![Queue Icon] | Queue Visual Management | - A Visual Management System In Place To Control Processing Of VALUE OBJECTS In Transactional Processes |
| ![PhysShip Icon] | Physical Shipment or Mailing | - Note Frequency Of Shipments |
| ![Max Icon] | FIFO – First In First Out Sequence | - Indicates A Device To Limit Quantity And Ensure FIFO Flow Of VALUE OBJECT Between Processes. Maximum Number Should Be Noted |</p>
<table>
<thead>
<tr>
<th>VSM Icon</th>
<th>Represents</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Manual Information Flow</td>
<td>Pull Of Materials – Usually From A Supermarket</td>
</tr>
<tr>
<td></td>
<td>Electronic Information Flow</td>
<td>Indicates A Device To Limit Quantity And Ensure FIFO Flow Of VALUE OBJECT Between Processes. Maximum Number Should Be Noted</td>
</tr>
<tr>
<td></td>
<td>Kaizen Lightning Burst</td>
<td>Highlights Improvement Needs At Specific Processes That Are Critical To Achieving The Value Stream Vision</td>
</tr>
<tr>
<td>= 2</td>
<td>Operator/ Associate</td>
<td>Represents A Person Viewed From Above</td>
</tr>
</tbody>
</table>
Appendix – 8 Wastes
The Eight Wastes

- Motion
- Inventory
- Quality Defects
- Waiting
- Over-Processing
- Sign-offs
- Transportation
- Over-Production
- Unused Creativity

No way!
### Value Add vs Non-Value-Add

<table>
<thead>
<tr>
<th>Non - Value Adding Process:</th>
<th>Value Adding Process:</th>
</tr>
</thead>
</table>

??% | ??%
“Find 100 Wastes In Gemba” Exercise

• As A Leader Of Driving Lean Conversion, You Must Be Masterful At The Never-ending Identification And Elimination Of Waste.

• Daily Management (Use Of Visuals And Daily Walk-around Process) Will Help With Identification Of Less-than-plan KPIs At The Cell Level. You Must Also Be Masterful At Identifying Waste In The Cell By “Just Looking.”

• To Test You And Your Team’s Skill, You Will Be Given One Hour To Identify Wastes In The Cells You Have Been Working In And Driving Change This Week.
<table>
<thead>
<tr>
<th>Waste Category</th>
<th>Cell: Waste Watcher:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unused Creativity</td>
<td></td>
</tr>
<tr>
<td>Quality Defects</td>
<td></td>
</tr>
<tr>
<td>Overproduction</td>
<td></td>
</tr>
<tr>
<td>Transportation</td>
<td></td>
</tr>
<tr>
<td>Waiting</td>
<td></td>
</tr>
<tr>
<td>Inventory</td>
<td></td>
</tr>
<tr>
<td>Motion</td>
<td></td>
</tr>
<tr>
<td>Process</td>
<td></td>
</tr>
</tbody>
</table>

Place an x in the appropriate column that best describes the waste category for each waste observed.

Waste observed:
Appendix – Value Stream Concepts
Lean Value Stream Concepts

1. Restructure The Organization Around The Value Stream.
2. Produce To Takt Time.
3. Develop One-piece Flow Wherever Possible.
4. Reduce Changeover Time And Run Smaller Batches.
5. Use Supermarket Pull Systems To Control Production Where One-piece Flow Cannot Exist.
6. Send Production Schedules To Only One Process In The Value Stream.
7. Level Production Volume At The Pacemaker.
8. Level Product Mix At The Pacemaker.
9. Key Performance Indicators (KPI’s).
10. Continuous Improvement Leadership.
Restructure The Organization Around The Value Stream.

- Provides Focused Leadership
- Creates Common Goals For The Organization
- Product Family (Start-to-finish) Scope
- Reduces Potential For Sub-optimization
- Assigns Appropriate Resources
Produce To Takt Time.

Elements of Standard Work

Targets Customer Demand
Reduces Chance For Over-production
Encourages Playbook Development
Staff And Produce To V.O.C.

Work Sequence

TAKT Time

Standard WIP
Production Should Be Pulled Along At Takt Time.

Do Not Allow Room Or Capability For Batching.

Don’t Produce 7 Units Once Per Week When The Customer Wants 1 Per Day.

Takt Time = 1 Day
Add Value to the Product Continuously Through the Process

- Less Waste Than Batch Processing
- Quicker Visibility Of Quality Problems
- Operators Take Broader Product Ownership
- Shorter Lead-time

Develop one Piece Flow

Raw Material

Finished Goods

Add Value to the Product Continuously Through the Process
Reduce Changeover Time And Run Smaller Batches.

Easier To Match Customer Demand Mix

Reduces Over-production

Shorter Lead-time

Lowers Inventory Pieces And Space
Use Supermarket Pull Systems

Control Production Where One-piece Flow Cannot Exist.

Which Runs Smoother?

Replaces Push With Pull System
Reduces Over-production
Shorter Lead-time And Less Inventory
Send Production Schedules To Only One Process In The Value Stream.

- Reduces Scheduling Complexity
- More Predictable And Often Reduced Lead-time
- Reduces Scheduling Variability Upstream
Level Production Volume At The Pacemaker.

- Allows For Paced Withdrawal To Takt Time
- Reduces Volume Fluctuations Upstream
- Supports Managing With Playbooks
Level Product Mix At The Pacemaker

- Flexibility To Match Customer Demand
- Reduces Over-production
- Shorter Lead-time
- Lowers Inventory Pieces And Space

A B A C A B A C A B A C .....
Key Performance Indicators (KPI’s)

“At a Glance” view of Performance

“Everyday Kaizen” Countermeasures taken at Cell Level

Legend & Historical Trend (include JOP)
Continuous Improvement Leadership

Driven By Company’s Strategy
Organize By Value Stream

<table>
<thead>
<tr>
<th>Action</th>
<th>Resp</th>
<th>When</th>
<th>Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

KPI Board

- Quality
- Delivery
- Cost

Kalzen!
Prioritize using PACE
Error-proofing is a technique for eliminating errors, making it impossible to make mistakes.

In Japan: Poka-yoke.

Poka = Inadvertent mistake
Yoke = To prevent

- Error-proofing advantages
- Reduces training requirements
- Eliminates many inspection operations
- Relieves operators from repetitive tasks
- Promotes creativity and value added activities
- Results in defect-free work
- Provides immediate action when problems arise
### Error-Proofing Techniques

Errors May Either Be Prevented Or Detected

<table>
<thead>
<tr>
<th>Technique</th>
<th>Prevention</th>
<th>Detection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control (Shut down)</td>
<td>An error is impossible</td>
<td>Defective item can’t move on to the next step</td>
</tr>
<tr>
<td>Warning</td>
<td>An error is about to be made</td>
<td>An error has been made</td>
</tr>
</tbody>
</table>

**Prevention**
- Warning Systems In Automobiles To Alert The Driver That Not All Seat Belts Have Been Fastened.

**Detection**
- Smoke Detectors
Control (Shutdown)
Prevention & Detection Examples

Prevention
• Cameras That Don’t Function When There Isn’t Enough Light.
• When Gas Stations Offered Leaded And Unleaded Gasoline, The Nozzle On The Unleaded Pump And Gas Tank Hole Were Smaller Than The Ones For Leaded Gasoline.

Detection
• Laundry Dryers That Have A Device That Shuts Them Down When Overheating Is Detected.
• A Computer Spell Checker.
**Contact Methods**

- Electrical Outlets Have Been Error-proofed To Assure Proper Polarity. It Is Impossible To Put A Plug In The Outlet Incorrectly.
- Guides Or Guide Pins That Assure Proper Insertion.
- Magnetic Contacts That Assure Proper Positioning.
- Two Handed Start Buttons To Avoid Hand Accidents.
- Pressure Sensitive Mats That Stops Dangerous Pinching Machinery When Someone Steps Onto Mat.
- Limit Switches On Fork Trucks That Prevents The Truck From Moving While The Driver’s Seat Is Unoccupied.
Fixed-Value Methods

- If Four Labels From Different Rolls Are Needed On Each Shipping Box, Put All The Labels On One Roll To Make It Easy To Spot Missed Labels.
- Kitted Components. Kitting Is Having The Exact Amount Of Needed Material For One Unit In One Box. It Makes It Easy To Catch Missing Components.
- Sensors That Count Parts As They Are Placed In A Box.
- Scales To Weigh Packaging Documentation And Alert An Operator To A Missed Document.
Error-Proofing Techniques

Motion-Step Methods

- Place Photo-electric Switches Into Each Component Bin.
- Beam Must Be Broken On Each Bin Before Conveyor Will Move.
- Motion Sensors To Stop A Machine To Prevent Safety Errors.
Error-proofing Devices Can:
- Prevent Errors From Occurring
- Detect The Error After It Occurred
- Detect The Defect After It Has Been Made

The Best Error-proofing Devices Are:
- Simple And Cheap
- Part Of The Regular Process
- Close To Where The Error Is Made
7 Steps to Error-Proofing

1. Create a Process Map and identify the locations at which the defects are found and made.
2. Evaluate current procedures for adequacy and determine if they are being followed.
3. Identify defect provoking conditions at each process step.
4. Identify the root cause(s) (error) of each type of defect and in which process step it occurs.
5. Identify the type of error-proofing device required.
6. Create the device and try it.
7. Measure for effectiveness.
When You Can’t Error-Proof

Use Colors And Color-coding
- Credit Card Receipts: Customer Gets Yellow Copy,
- Merchant Gets White Copy.

Use Shapes
- Notch A Stack Of Forms So It’s Easy To Tell If The
- Forms Are Out Of Order

Make It Easy To Do It Right
- Checklists
- Effective Data Collection Formats
- Workflow With Fewer Hand-offs
- Symbols
One of the things you will find as you move along your Lean journey is that going it alone is much harder than if you had a coach. A good coach will push you to greater and greater levels of self-sufficiency. Regardless of where you are on your journey, we can help.

If you are just beginning your concerted continuous improvement efforts, we can help you chart your course and teach you what you need to know to start leading change on your own. For those who are further along your journey, we can help by teaching you more advanced topics, reviewing what you are already doing, and helping you improve your improvement processes.
Ways We Support Our Clients

On-site Coaching / Consulting: In this traditional form of consulting, we come to you and work hand-in-hand with you to bring about change in your organization. Lean assessments, Kaizen facilitation, and policy / strategy deployment coaching are popular ways to use this form of support.

Remote Coaching / Consulting: Remote consulting puts technology to use so we can help you in a variety of ways. Need a quick answer? Want a charter reviewed? Interested in a second opinion about a new layout? Want us to review a video of your process and offer suggestions? With email, telephones, videos, screen sharing, and video chatting at our disposal, we can give you quick answers without much investment.
Lean Help in the NE Ohio Area: There are a lot of factors that go into choosing a coach. Getting a good fit is the most important. But there are some special benefits to having a continuous improvement expert right in your own back yard.

- **Just in Time training.** Want to do a large scale kaizen? No problem! But, having a local Lean coach also allows you to do smaller, Just in Time projects as well. These mini improvement events can yield big gains, but more importantly they require less planning time on your part and have less impact on your team’s production than a traditional kaizen.

- **You save on travel expenses.** No airfare. No lodging. Using a local coach saves you money.

- **You can get help on much shorter notice.** When your Lean coach is nearby you don’t have to wait for the help that you need. There is no need to work around airline schedules or worry about weather causing delays for your consultant.