Value Stream Mapping: Theory & Cases

Professor Peter Hines
Lean Enterprise Research Centre
Cardiff Business School

- Formed in 1994 by Prof Dan Jones & Prof Peter Hines
  - 30 staff now

“Researching, applying, & communicating lean thinking”
Overview

- Value Stream Mapping Background
- Some of the Value Stream Maps
- Cases and Examples
Value Stream Mapping

Background
My Involvement with VSM

1993-1997  Supply Chain Development Programme
           * Process Activity Mapping
           * Brown Paper Mapping
1997      Paper: The Seven Value Stream Mapping Tools
           * Codified Mapping Approach
1997      First Rother & Shook publication
           * Big Picture Mapping
1999      Corus-Forge-Volvo Transmission VSM work
2000      Going Lean publication
           * see www.leanenterprise.org.uk
2002      Lean Profit Potential
           * see www.leanenterprise.org.uk
What Have I Learned?

- Don’t be a ‘happy mapper’
- Start by understanding what you are trying to achieve
  - Can anyone tell me the 4 Lean Principles?
  - And what about a link to Strategy?
- Involve the recipients in the mapping
  - Don’t ‘do mapping’ to people
- Don’t Just Map Internally
- Don’t Just Map Order Fulfilment
- No one map will do the job
  - Chose the right maps
Relation of Value, Cost & Waste

Customer Perceived Value vs. Waste/Cost

Creating Lean Solutions:
1. Reduce Internal Waste
2. Develop Customer Value

Cost-Value Equilibrium

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We need to find the waste first

<table>
<thead>
<tr>
<th>Process Activity Mapping</th>
<th>Supply Chain Response Matrix</th>
<th>Big Picture Mapping</th>
<th>Four Fields Mapping</th>
<th>Demand Amplification Mapping</th>
<th>Decision Point Analysis</th>
<th>Physical Structure Volume Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over Production</td>
<td>L</td>
<td>M</td>
<td>L</td>
<td>M</td>
<td>M</td>
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<td>Waiting</td>
<td>H</td>
<td>H</td>
<td>L</td>
<td>H</td>
<td>M</td>
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<td>Inappropriate Processing</td>
<td>H</td>
<td>M</td>
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</tr>
<tr>
<td>Unnecessary Inventory</td>
<td>M</td>
<td>H</td>
<td>M</td>
<td>L</td>
<td>H</td>
<td>M</td>
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<tr>
<td>Unnecessary Motion</td>
<td>H</td>
<td>L</td>
<td></td>
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<td>Defects</td>
<td>L</td>
<td>H</td>
<td>H</td>
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</tbody>
</table>

H = Highly useful, M = Medium, L = Low
### Awareness Stage: 1980-1990

<table>
<thead>
<tr>
<th>Theme</th>
<th>Shop Floor Practice</th>
</tr>
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<tbody>
<tr>
<td>Focus</td>
<td>JIT Techniques, Tools</td>
</tr>
<tr>
<td>Business Process</td>
<td>Shop Floor Manufacturing</td>
</tr>
<tr>
<td>Industry Sector</td>
<td>Automotive Assembly</td>
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<td>Gaps</td>
<td>Outside Shop Floor</td>
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<td>Outside Single Firm</td>
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<td>Narrow Focus</td>
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<td>Quality Stage: 1990-mid 1990s</td>
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<tr>
<td><strong>Theme</strong></td>
<td>Best Practice Benchmarking</td>
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<tr>
<td><strong>Focus</strong></td>
<td>Cost, Quality, Reengineer</td>
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<tr>
<td><strong>Business Process</strong></td>
<td>Manufacturing &amp; Mat. Mgt</td>
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<td><strong>Industry Sector</strong></td>
<td>Automotive Ass./ Supply</td>
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<td><strong>Gaps</strong></td>
<td>Human Element</td>
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<td>Supply Chain</td>
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<td>Systems Perspective</td>
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<tr>
<td>Theme</td>
<td>Lean Enterprise</td>
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<tr>
<td>-----------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>Focus</td>
<td>Cost / Process QCD</td>
</tr>
<tr>
<td>Business Process</td>
<td>Order Fulfilment: Val. Str.</td>
</tr>
<tr>
<td>Industry Sector</td>
<td>(Repetitive) Manufacture</td>
</tr>
<tr>
<td>Gaps</td>
<td>(Other) Process Integrate Relationships Integrating Industries</td>
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</tbody>
</table>
### Value System: 2000+

<table>
<thead>
<tr>
<th>Theme</th>
<th>System Capability</th>
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<tr>
<td>Focus</td>
<td>Value &amp; Cost</td>
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<tr>
<td>Business Process</td>
<td>Integrated Processes</td>
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<tr>
<td>Industry Sector</td>
<td>All Manufacturing/Service</td>
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<tr>
<td>Gaps</td>
<td>Low Volume Manufacture</td>
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<td></td>
<td>Strategic Integration</td>
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<td>Total Systems Capability</td>
</tr>
</tbody>
</table>
Lean Network Systems

Adapted from: Fisher, 1997

Demand Variability

Volume

Runner
Repeater
Stranger

High Variety/Complexity
Avoid? Stock?

Medium Variety/Complexity
Make To Order

Low Variability/Complexity
Kanban
Inventory Profile of the UK Automotive Supply Chain

Source: Holweg (2002)

Value Stream Mapping

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Some of the Maps

Big Picture Level
Big Picture Map: Current State

- **Operation 1**
  - **C/T = 5 sec**
  - **Uptime = 100%**
  - **450 sec av**
  - **Batch = 10**
  - **Variety = 3**
  - **Red Blocks**
  - **5 blocks**
  - **510 sec**
  - **1 piece per 7.5 min**
  - **1 every 15 sec**

- **Operation 2**
  - **C/T = 7 sec**
  - **Uptime = 100%**
  - **450 sec av**
  - **Batch = 7**
  - **Variety = 3**
  - **Blocks R Us**
  - **Random Supply**
  - **Numerous Variety**
  - **Batches**
  - **5 blocks**
  - **4 blocks**
  - **4 blocks**
  - **2 blocks**
  - **510 sec**
  - **30 pieces per 7.5 min**
  - **1 every 15 sec**

- **Operation 3**
  - **C/T = 5 sec**
  - **Uptime = 100%**
  - **450 sec av**
  - **Batch = 1**
  - **Variety = 3**
  - **Blocks R Us**
  - **Random Supply**
  - **Numerous Variety**
  - **Batches**
  - **5 blocks**
  - **60 sec**
  - **75 sec**
  - **60 sec**
  - **5 sec**
  - **30 sec**
  - **510 sec**

- **Operation 4**
  - **C/T = 7 sec**
  - **Uptime = 100%**
  - **450 sec av**
  - **Batch = 7**
  - **Variety = 3**
  - **Blocks R Us**
  - **Random Supply**
  - **Numerous Variety**
  - **Batches**
  - **4 blocks**
  - **60 sec**
  - **75 sec**
  - **60 sec**
  - **5 sec**
  - **30 sec**
  - **510 sec**

- **Lean Ltd.**
  - **30 pieces per 7.5 min**
  - **1 every 15 sec**
  - **Variety = 3**
  - **1 piece per time**

- **Manager’s Schedule**
  - **30 round Forecast**
  - **15s Order**

- **Operator**

- **Planning**

- **30 sec**

- **Prodtn Lead Time = 735 sec**

- **VA Time = 24 sec**

**Blocks R Us**

**Random Supply**

**Numerous Variety**

**Batches**

**Red Blocks 510 sec**

**Prodn Lead Time = 735 sec**

**VA Time = 24 sec**
Big Picture Map: Future State

Blocks R Us
Supply to Pull
Standard Number

Forecast
Order
Planning

Lean Ltd.
TAKT = 15 sec
Variety = 3
1 piece per time

30 round Forecast
10s Order

Daily Order

Operation 1
C/T = 5 sec
Uptime = 100%
300 sec av
Batch = 1
Variety = 1

Operation 2
C/T = 5 sec
Uptime = 100%
300 sec av
Batch = 1
Variety = 1

Operation 3
C/T = 5 sec
Uptime = 100%
300 sec av
Batch = 1
Variety = 3

Operation 4

R Y G

Changeover
Milk Round
Cycle Time
Waste Elimination

Prodn Lead Time = 160 sec
VA Time = 20 sec

Daily Order
30 round
Forecast
10s Order

Operation 1
C/T = 5 sec
Uptime = 100%
300 sec av
Batch = 1
Variety = 1

Operation 2
C/T = 5 sec
Uptime = 100%
300 sec av
Batch = 1
Variety = 1

Operation 3
C/T = 5 sec
Uptime = 100%
300 sec av
Batch = 1
Variety = 3

Operation 4

R Y G

Changeover
Milk Round
Cycle Time
Waste Elimination

Prodn Lead Time = 160 sec
VA Time = 20 sec
Some of the Maps

Detailed Level
# Process Activity Map

<table>
<thead>
<tr>
<th>Step</th>
<th>Flow</th>
<th>VA % Area</th>
<th>Dist</th>
<th>Time</th>
<th>People</th>
<th>C/T</th>
<th>Up/T</th>
<th>Avail.</th>
<th>Batch</th>
<th>Var</th>
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</table>
Quality Filter Map

- Identifies where quality problems exist in the supply chain
- 3 types of quality defect
  - Product defects - defects in goods that are not caught by in-line or end-of-line inspection and are therefore passed on to customers
  - Service defects - problems given to a customer not directly related to the product but to the level of service
  - Internal scrap - defects produced in a company that have been caught by in-line or end-of-line inspection
Product Variety Funnel

Value Stream Mapping

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Value Analysis Time Profile

Horizontal plateau shows opportunities for lead-time reduction.

- Assembly operations
- Post-Assembly decanting, inspecting etc
- WIP store

Operations:
- Press operations
- Store goods in
- Receive goods in

Cost reduction opportunity.
Value Analysis Time Profile

£2.29 Total
£2.01 VA
337 hrs
Value Analysis Time Profile

£2.03 Total
£1.96 VA
225 hrs
Four Field Map: Current State

- **Finance Phase 2A**
- **Monica’s Table**
- **Charge**
  - Yes
  - No
- **Non Charge**
  - Yes
  - No
- **Tag**
  - Pull
  - Need File
  - Get File
  - Yes
  - No
- **Skills**
  - Yes
  - No
- **Process Post**
  - Post Bucket
  - Post Bucket
  - No
  - Yes
- **Standards & Comments**
  - Time: 2 - 7.5 hrs, Resource: 2 hrs; Variance depends on Case Worker, variable location of sort
  - Time: 2 hrs, Resource: 1 hr; Backlog calculated using oldest date (worst case scenario)
  - Time: 1 hr, Resource: 1 hr; Not FIFO
  - Time: 0.25 hr, Resource: 0.25 hr; Reception Tag & Filing
  - Time: 3 - 9 hrs, Resource: 3.5 - 2 hrs; All file requests dealt with at the same time
  - Time: 1 wk, Resource: 0.5 hr; Assume 1 person processing post
  - Time: 13 to 248 days, Resource: 3:20 to 5:15 hrs; Unable to quantify referral time

**Value Stream Mapping**

- Cardiff University
- Total: 27

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Four Fields Map: Future State

Charge

Non Charge

Filing

Senior Case Worker

<table>
<thead>
<tr>
<th>Time</th>
<th>Resource</th>
<th>Standards &amp; Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 – 15 mins</td>
<td>10 – 15 mins</td>
<td>Training needed / cultural issues to be addressed</td>
</tr>
<tr>
<td>5 mins</td>
<td>5 mins</td>
<td>Charge post is sent to C/W with File (no need to pull file at later stage)</td>
</tr>
<tr>
<td>2 hrs if rqrd</td>
<td>5 mins</td>
<td>Referral process: Matter would always be passed back to C/W after the Senior C/W has considered it, either with a work solution or guidance notes. This box to be emptied once daily (allocation rota)</td>
</tr>
<tr>
<td>10 mins</td>
<td>10 mins</td>
<td>Non Charge post, where file needed, files to be supplied by filing 4 times daily (2 am, 2 pm) from a tray in each pod. This activity is a priority</td>
</tr>
<tr>
<td>2 hrs</td>
<td>2 hrs</td>
<td>Calculated per piece of post</td>
</tr>
<tr>
<td>5 mins</td>
<td>5 mins</td>
<td>Post split into 1st, 2nd, Dx</td>
</tr>
</tbody>
</table>

Value Stream Mapping

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Cases and Examples

#1 Internal: Main Motors
The Research Model

Strategic Level

Business Strategy Formation and Policy Deployment
Business Strategy Validation and Action Planning

Operational Level

Customer Understanding
Process Activity Understanding
Process Costing Understanding
Critical Success Factors

- Continue to grow markets share in the 3 channels
- Recruitment, development and retention of skilled & motivated workforce
- External influenced innovation
- Developing the right balance between the 3 channels
- Close existing & new customer relationships
- Keep the franchise
- Long term focus & profitability
- Continuing to develop brand presence
## Key Business Targets

<table>
<thead>
<tr>
<th>KPIs</th>
<th>Unit</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
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</thead>
<tbody>
<tr>
<td>Gross Profit/New Car</td>
<td>%</td>
<td>2.0%</td>
<td>2.3%</td>
<td>2.6%</td>
<td>2.9%</td>
<td>3.2%</td>
</tr>
<tr>
<td>Gross Profit/Used Car</td>
<td>%</td>
<td>7.0%</td>
<td>7.6%</td>
<td>8.2%</td>
<td>8.8%</td>
<td>9.4%</td>
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<tr>
<td>Finance Penetration New Cars</td>
<td>%</td>
<td>23.0%</td>
<td>23.0%</td>
<td>23.0%</td>
<td>23.0%</td>
<td>23.0%</td>
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<tr>
<td>Finance Penetration Used Cars</td>
<td>%</td>
<td>16.0%</td>
<td>17.8%</td>
<td>19.6%</td>
<td>21.4%</td>
<td>23.2%</td>
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<tr>
<td>Admin Expenses</td>
<td>%</td>
<td>0.9%</td>
<td>1.0%</td>
<td>1.1%</td>
<td>1.0%</td>
<td>0.9%</td>
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<tr>
<td>Market Share: Region vs Nation</td>
<td>%</td>
<td>6.8/6.8</td>
<td>7.0/7.0</td>
<td>7.3/7.3</td>
<td>7.5/7.5</td>
<td>7.8/7.8</td>
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<td>Retention New: First Service</td>
<td>%</td>
<td>80%</td>
<td>80%</td>
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<td>Retention New: 3 years</td>
<td>%</td>
<td>30%</td>
<td>36%</td>
<td>42%</td>
<td>48%</td>
<td>54%</td>
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<tr>
<td>Retention Used: First Service</td>
<td>%</td>
<td>25%</td>
<td>26%</td>
<td>27%</td>
<td>28%</td>
<td>29%</td>
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<td>Return on Total Turnover</td>
<td>%</td>
<td>1.4%</td>
<td>1.9%</td>
<td>2.4%</td>
<td>3.0%</td>
<td>3.5%</td>
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<td>Volumes: New Cars</td>
<td>#</td>
<td>550</td>
<td>580</td>
<td>610</td>
<td>640</td>
<td>670</td>
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<td>Volumes: Used Cars</td>
<td>#</td>
<td>270</td>
<td>296</td>
<td>322</td>
<td>348</td>
<td>374</td>
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<td>Service Parts Absorption</td>
<td>%</td>
<td>60%</td>
<td>68%</td>
<td>76%</td>
<td>84%</td>
<td>92%</td>
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<td>Stock Turn: Used Cars</td>
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<td>8</td>
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<td>Stock Turn: Parts</td>
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<td>7.9</td>
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<td>OCE: New Cars</td>
<td>%</td>
<td>39.5%</td>
<td>41.0%</td>
<td>42.5%</td>
<td>44.0%</td>
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<td>OCE: Used Cars</td>
<td>%</td>
<td>38.4%</td>
<td>45.6%</td>
<td>52.8%</td>
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<td>67.2%</td>
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<td>OCE: Service</td>
<td>%</td>
<td>51.1%</td>
<td>55.2%</td>
<td>59.3%</td>
<td>63.4%</td>
<td>67.4%</td>
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<td>ILU skills/competency</td>
<td>%</td>
<td>45.2%</td>
<td>65%</td>
<td>75%</td>
<td>85%</td>
<td>95%</td>
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<tr>
<td>Attribute</td>
<td>Importance</td>
<td>Satisfaction</td>
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<td>Brand</td>
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<td>Product Characteristics</td>
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<td>Price</td>
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<tr>
<td>Order/Delivery Time</td>
<td>3.0</td>
<td>2.5</td>
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<tr>
<td>Dealer Reputation</td>
<td>4.0</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Staff at the Dealer</td>
<td>3.5</td>
<td>3.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dealer Facilities</td>
<td>4.0</td>
<td>4.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>After Sales Service</td>
<td>4.0</td>
<td>4.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

New Car Value Attributes Importance vs Satisfaction

Value Stream Mapping

© Professor Peter Hines, 2005
# The Service Process

## Process Activity Mapping Example

### Process Activity: Car collection & Work division

<table>
<thead>
<tr>
<th>Activity</th>
<th>Flow</th>
<th>Activity</th>
<th>Area</th>
<th>Distance</th>
<th>Time (min)</th>
<th>People</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer comes through the door</td>
<td>T</td>
<td>SA</td>
<td>Showroom</td>
<td>20</td>
<td>0.25</td>
<td>1</td>
</tr>
<tr>
<td>Customer arrives to Service desk and sits</td>
<td>D</td>
<td>W</td>
<td>Showroom</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Identify the customer</td>
<td>I</td>
<td>SA</td>
<td>Showroom</td>
<td>0</td>
<td>0.5</td>
<td>2</td>
</tr>
<tr>
<td>Control if job card information are correct</td>
<td>I</td>
<td>W</td>
<td>Showroom</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Customer signs</td>
<td>O</td>
<td>SA</td>
<td>Showroom</td>
<td>0</td>
<td>0.1</td>
<td>2</td>
</tr>
<tr>
<td>Collect customer's keys</td>
<td>O</td>
<td>SA</td>
<td>Showroom</td>
<td>0</td>
<td>0.1</td>
<td>2</td>
</tr>
<tr>
<td>Arrangement to return car</td>
<td>I</td>
<td>SA</td>
<td>Showroom</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Write arrangement on job card</td>
<td>O</td>
<td>SA</td>
<td>Showroom</td>
<td>0</td>
<td>0.25</td>
<td>1</td>
</tr>
<tr>
<td>Find a place for job card</td>
<td>D</td>
<td>W</td>
<td>Showroom</td>
<td>3</td>
<td>0.5</td>
<td>1</td>
</tr>
<tr>
<td>Waits for workshop controller</td>
<td>D</td>
<td>W</td>
<td>Showroom</td>
<td>0</td>
<td>120</td>
<td>0</td>
</tr>
<tr>
<td>Ian checks job cards</td>
<td>I</td>
<td>W</td>
<td>Showroom</td>
<td>0</td>
<td>0.5</td>
<td>1</td>
</tr>
<tr>
<td>Ian informs Darren who is going to do the service</td>
<td>O</td>
<td>SA</td>
<td>Showroom</td>
<td>0</td>
<td>0.1</td>
<td>2</td>
</tr>
<tr>
<td>Darren up-dates Time Sheet</td>
<td>O</td>
<td>W</td>
<td>Showroom</td>
<td>0</td>
<td>0.1</td>
<td>1</td>
</tr>
<tr>
<td>Ian hands out work between technicians</td>
<td>T</td>
<td>SA</td>
<td>Showroom/Workshop</td>
<td>20</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

**TOTALS:** 43 129.4 20
The Service Process
Big Picture Map

- **Car Collection**
  - 90% customer brings the car
  - 10% car collected at home/work

- **Prepare Service Job Cards**
  - 5 min - the day before service

- **Understanding Requirements & Booking**
  - 90% phone call
  - 10% personal visit
  - 5 min

- **Routine Regular service**
  - 75%

- **Service at Dealer**
  - 25%

- **Concerns: breakdown, warranty**

- **Investigation & Paperwork**

- **Large Repair**
  - 5%

- **Small Repair**
  - Done immediately
  - 95%

- **Lead Time**: 3.6 days

- **Work division**
  - Continue scheduling during day

- **Parts storage**

- **Mechanical Work**
  - 5 operators
  - 70%

- **Prepare Service Job Cards**
  - 5 min - the day before service

- **Check parts & Pre-picking**
  - 3.5 min

- **PC Replenish System**
  - 24h - Local storage center
  - 48h - From other dealer
  - Automatic replenishment

- **Found more repairs**
  - Call customer

- **Valeting Service**
  - 95% 22 min
  - 5% 1.5 h

- **Final Road Test**
  - 3 cars = 1 h

- **Quality Feed-back**
  - Ring 3-5 days later

- **Mechanical Work**
  - 30%

- **Work division**
  - Continue scheduling during day

- **Service at Dealer**
  - 25%

- **Concerns: breakdown, warranty**

- **Investigation & Paperwork**

- **Large Repair**
  - 5%

- **Small Repair**
  - Done immediately
  - 95%

- **Lead Time**: 3.6 days

- **Work division**
  - Continue scheduling during day

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  - 5 operators
  - 70%

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  - 5% 1.5 h

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  - 3 cars = 1 h

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  - Ring 3-5 days later
## New Car Sales Process

<table>
<thead>
<tr>
<th>Activities</th>
<th>VA</th>
<th>FVA</th>
<th>SA</th>
<th>W</th>
<th>Activity cost %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visit at Dealer &amp; take order</td>
<td>??</td>
<td>??</td>
<td>??</td>
<td>??</td>
<td>??</td>
</tr>
<tr>
<td>Source car</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Car arrival, Delivery arrang. &amp; Service Booking</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Invoice &amp; AFRL</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>PDI - Mechanical Work &amp; Road Testing</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Valeting</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Customer Collection</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### The Costing Model
The Process Costing Perspective

ASC Area Storage Centre

Source New Car

Finalise Deal & Take Order

Decision to Purchase

Sales DP - 3
10,081.24 19%

Sales DP - 2
4,750.40 9%

Sales DP - 1
6,577.48 13%

Other Dealer Stock

Own Stock

Factory Order

Invoice Emission & AFRL - Trigger VW Payment

Think &/or Visit Other Dealer

Administration DP - 1
2,840.40 5%

Car Arrival & Delivery Check

Delivery Arrangement

PDI

Valeting

Customer Collection

Sales DP - 5
7,125.60 13%

Sales DP - 6
2,740.61 5%

Mech.Service DP - 6
5,899.91 15%

Mech.Service DP - 1
2,859.94 5%

Sales DP - 4
8,404.55 16%

Stock Maintaining
71,486.00

General

>> Sales DP General Costs 58,746.75
>> Commission 26,632.66

Value Stream Mapping

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The Strategic Change Programme

Value Creation

- Used Car Loyalty Scheme
- Service Customer Care
- Service Pricing incl. Courtesy Car
- Used Car Replacement Cycle

Waste Reduction

- Scheduling of Service Bay incl. PDI
- Scheduling of Valeting
- Right First Time Lean Servicing

Infrastructure

- Annualised Hours
- Measurement Scheme
- Skills/Competency Scheme

External

- Improved Supplier New Car OTD Cycle
The Profit Potential

(£ annually by end 2002)

Level 1 (Internal Waste Reduction) £ 49.6K
Level 2 (Customer Value Added) £ 62.5K
Level 3 (Multiplier Effects) £ 43.2K
Annual Profit Potential by end 2004 £155.3K

Equivalent to a 105% increase in profitability
Cases and Examples

#2 Supply Chain:
Corus - Automotive
LEAP: Participating Companies

- **Steel Mill**
  - Corus
  - British Steel Distribution

- **Steel Service Centres**
  - Steel & Alloy

- **First Tier Component Producers**
  - Albion Pressed Metal
  - Tallent Engineering
  - LDV
  - GKN Sankey
  - Krupp Camford
  - Wagon Group

- **Automobile OEM’s**
## Specific Improvement Targets

<table>
<thead>
<tr>
<th>Improvement Area</th>
<th>British Steel Strip Products</th>
<th>Steel Service Centres</th>
<th>Metal Processing Customers</th>
<th>Total for the Three Tiers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Lead Time Reduction</td>
<td>40%</td>
<td>40%</td>
<td>40%</td>
<td>40%</td>
</tr>
<tr>
<td>2. Time to Market Reduction</td>
<td>30%</td>
<td>30%</td>
<td>30%</td>
<td>30%</td>
</tr>
<tr>
<td>3. Stock Reduction</td>
<td>10%</td>
<td>20%</td>
<td>20%</td>
<td>15%</td>
</tr>
<tr>
<td>4. Quality Improvement</td>
<td>50%</td>
<td>20%</td>
<td>50%</td>
<td>45%</td>
</tr>
<tr>
<td>5. Productivity Improvement</td>
<td>5% per annum</td>
<td>5% per annum</td>
<td>5% per annum</td>
<td>15% over 3 years</td>
</tr>
<tr>
<td>6. Increased Mutual Business</td>
<td>30%</td>
<td>30%</td>
<td>30%</td>
<td>30%</td>
</tr>
</tbody>
</table>
Demand Amplification

- Blanking plan
- Blanking Actual
- Pressing Plan
Demand Amplification

![Graph showing demand amplification with axes labeled Tonnes and Enduser Demand, Wide coil orders, BSSP Deliveries]
C/T = 1 sec  
C/O = 20 min  
Uptime = 70%  
EPE 10 Days

C/T = 13 min  
C/O = 0 min  
Uptime = 85%  
2 shifts  
27,000 sec

C/T = 3 min  
C/O = 10 min  
Uptime = 55%  
2 shifts  
27,000 sec

C/T = 1 hour  
C/O = 27,000 sec

C/T = 9 min  
C/O = 27,000 sec

Tray = 14 off

12,000 pcs/mo

Lead Time = 47 to 65 days

VA Time : 7262 sec (121 min)
## LEAP Targets & Results

<table>
<thead>
<tr>
<th>Area</th>
<th>Target</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead Time</td>
<td>40% ▼</td>
<td>20-90% ▼</td>
</tr>
<tr>
<td>Stock Reduction</td>
<td>15% ▼</td>
<td>20-75% ▼</td>
</tr>
<tr>
<td>Quality</td>
<td>50% ▲</td>
<td>50 ppm</td>
</tr>
<tr>
<td>Productivity</td>
<td>15% ▲</td>
<td>8-33% ▲</td>
</tr>
<tr>
<td>Increased Business</td>
<td>30% ▲</td>
<td>40-50% ▲</td>
</tr>
<tr>
<td>Design Time</td>
<td>30% ▼</td>
<td>30% ▼</td>
</tr>
</tbody>
</table>
Cases and Examples

#3 An Information Based Process: Insurance Company
The Twelve Phases Map

1. Planning
2. Pre-audit
3. Initial visit
4. Billing
5. Cert. production
6. Tech. Cert. review
7. Outsourcing
8. Cert. completion
9. Visit cycle
10. Billing Amf
11. Visit 1
12. Strategic review

Mapped at the ‘point of activity’
Completing the Flow

Current State Maps

Paper workflow

Value Stream Mapping © S A Partners, 1993-2005
© Professor Peter Hines, 2005
Current state map

Start
Current state map
# Current State

## Phases —

<table>
<thead>
<tr>
<th>Phases –</th>
<th>Time Line (calendar days)</th>
<th>Resource</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Minimum</td>
<td>Maximum</td>
</tr>
<tr>
<td></td>
<td>Days</td>
<td>Hours</td>
</tr>
<tr>
<td>1. Planning process</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>2. Pre-audit</td>
<td>3</td>
<td>30</td>
</tr>
<tr>
<td>3. Initial audit</td>
<td>3</td>
<td>30</td>
</tr>
<tr>
<td>4. Billing</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>5. Cert. Production &amp; proof reading</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>6. Tech. cert. review</td>
<td>17.5</td>
<td>47.5</td>
</tr>
<tr>
<td>7. Outsourcing</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>8. Cert. completion</td>
<td>2.5</td>
<td>3</td>
</tr>
<tr>
<td>9. Visit cycle</td>
<td>0.5</td>
<td>6</td>
</tr>
<tr>
<td>10. Billing AMF</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>11. Visit 1</td>
<td>2</td>
<td>31</td>
</tr>
<tr>
<td>12. Strategic review</td>
<td>9</td>
<td>26</td>
</tr>
<tr>
<td><strong>Total of process</strong></td>
<td><strong>42.5</strong></td>
<td><strong>201.5</strong></td>
</tr>
</tbody>
</table>
### Phase 1 – Resource Planning

<table>
<thead>
<tr>
<th>Major Wastes</th>
<th>Root Cause</th>
<th>Opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Print of email (sales brief)</td>
<td>Comfort factor</td>
<td>Read electronically</td>
</tr>
<tr>
<td>Validation of data</td>
<td>Information not right</td>
<td>Lack of trust</td>
</tr>
<tr>
<td>Single point of contact (1st time)</td>
<td>Planning to fail</td>
<td>Always done it this way</td>
</tr>
<tr>
<td>Use of planning spreadsheet/correspondence log</td>
<td>Current systems do not allow for monitoring as per s/s</td>
<td>Comfort/lack of trust</td>
</tr>
<tr>
<td>Readiness of client</td>
<td>Sales target driven. Communications/Education of client. Information not right</td>
<td>Always done it this way</td>
</tr>
</tbody>
</table>
# Future State

<table>
<thead>
<tr>
<th>Phases</th>
<th>Time Line (calendar days)</th>
<th>Resource</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Minimum</td>
<td>Maximum</td>
</tr>
<tr>
<td></td>
<td>Days</td>
<td>Hours</td>
</tr>
<tr>
<td>Planning</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Pre-Audit visit and Reports</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Visits and reports</td>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td>Post visit support service</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>4</strong></td>
<td><strong>32</strong></td>
</tr>
</tbody>
</table>

85% reduction in time  
50% reduction in resources
What Have You Learned?

- Don’t be a ‘happy mapper’
- Start by understanding what you are trying to achieve
  - Can anyone tell me the 4 Lean Principles?
  - And what about a link to Strategy?
- Involve the recipients in the mapping
  - Don’t ‘do mapping’ to people
- Don’t Just Map Internally
- Don’t Just Map Order Fulfilment
- No one map will do the job
  - Chose the right maps