Lean Process Improvement

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About Us

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About You

• In 1 minute or LESS:
  – Name/Title
  – Institution
  – Primary job responsibilities
  – Number of years working in higher education
  – This workshop will have been a success and made good use of my time if?
Agenda

• Lean Background & Thinking
• Lean Tools: 5s; Waste
• Process Mapping:
  – Current & Future State Process Mapping
  – Current and Future State Value Stream Mapping
• Initiating and completing your project:
  – Project Identification/Charter; A3; Action/Implementation Plan; Change Management Considerations
General Process Improvement Approach

- Project Organization
  - Charters, team members, resources, timeline, responsibilities.

- Examine Current Process
  - SIPOC, Cross Functional Flowchart or Value Stream Map
  - Observe/walk the process
  - Baseline performance data
  - Customer/user experience

- Design the Future Process
  - Lean; remove waste and non value added steps
  - Streamline process steps

- Plan
- Implement
- Check performance against baseline
- Adjust
Key Terms

- **SIPOC** - High-level understanding of the scope of the process: identification of Suppliers, Inputs, Processes, Outputs, Customers

- **Value Stream** - All of the sequence of steps, from beginning to end to create what the customer needs

- **Value Added** - Activity that the customer views necessary for the end result to meet their quality expectations

- **Non Value Added & Waste** - Unnecessary activity; things the customer does not value

- **Incidental Work** - Needed for internal customers, regulations … but customer does not value

- **External Customer** - Receiver of the product or service outside the organization

- **Internal Customer** - Receiver of the product or service inside the organization, often the individual downstream in the process
Lean Thinking

$5-million worldwide benchmarking study on the auto industry

Books:
*The Machine That Changed the World* by Womack, Jones, Roos

*Lean Thinking* By Womack, Jones
History of Industry: Toyota Post War

The Need:

- High-quality (the first time around)
- Work based on demand vs work for work’s sake
- Dramatically lower costs
History of Industry:
Toyota Post War

The Solution:

• Flow production: make what is needed when it’s needed
  – No inventory
  – Based on customer demand and specifications

• Highly flexible, highly capable, efficient processes

• Consider what customer wants: ‘voice of customer’
Challenges Facing Higher Ed

• Reduced funding
• Demand for greater accountability
• Perceived as expensive and inefficient
  – Processes failing to meet needs of those they serve ‘customer’: students, parents, faculty, chairs, donors, employers, alumni, staff
  – Processes slow; lack documentation, standardization and training
  – Processes cross vice presidential areas with each area working on their part of the process in silos; no real owner responsible for ensuring process is optimal
• Climate of continuously improving does not exist
The Competitive Universe

“I WANT IT ON TIME and in the proper hands. I want it done correctly, accurately, exactly, precisely, perfectly, efficiently, reliably, expertly, proficiently, faithfully, totally, absolutely, unequivocally, unmitigatedly, maturely, lawlessly, supremely, unsurpassedly and certainly without fault. I want it unharmed, unbotched, untainted and unscrewed-up. And most of all I want it done CHEAP!”

“Our Most Important Package Is Yours.”
Speed – Cost – Quality
Pick any 2

- Speed
- Low Cost
- High Quality
What Is Lean?

- What have you heard?
- Isn’t this stuff for people who make cars?
Lean Thinking

A simple definition:

Deliver the most value from your customer’s perspective while consuming the fewest resources
Customer is King

What is a Customer?
Why a Lean Office? Does It Apply to Higher Ed?

- Most organizational costs are administrative
- Work completed faster and more accurately
- Improves productivity and morale
Lean Thinking: The Fundamental Insight

- Focus on each product/service and its value stream (how it’s created)
- Ask which activities are waste and which truly create value
- Enhance the value and eliminate the waste to optimize the whole!

How do we gauge success? Time
Where's the Time in an Typical Process?

- Traditional improvement efforts focus on the value added time – the good process steps that create value.
- Focusing on non value added (NVA) has the largest opportunity for improvement.
Shrinking Total Process Time

= Value Added Time

= Non Value Added Time

Remove Non Value Added Activities

4-weeks

2-weeks
Lean Thinking in Summary

1. Specify **Value** by product/service
2. Identify the **Value Stream**
3. Make the product/service **Flow**
4. At the **Pull** of the customer
5. In pursuit of **Perfection**
Lean Thinking

1. Specify **Value** by product from the standpoint of the customer

   – Applies to “services” as well as “goods”: Most customers just want a solution to their problem!
Lean Thinking

2. Identify the **Value Stream** from the start of the process to the end

   – Eliminate steps that don’t create value and cause waste
Lean Thinking

3. Make the product/service **Flow** continuously

Avoid defects and bottlenecks
– Rework
– Errors
– Waiting
Lean Thinking

4. At the **Pull** of the Customer:

   – Delivering only what is needed, when it’s needed
Lean Thinking

5. In pursuit of **Perfection**

- Perfection is the complete elimination of waste and non value added activities; requires a continuous improvement mentality
Lean Principles

• The customers always define value for the process
• Lean distinguishes steps that create value from those that do not
• Lean reduces waste and builds in quality
• The people who do the work are the experts
• Learning to improve work is as important as producing the work output
Lean Tools:
5S & Waste
A five-step improvement process to create and maintain a clean, neat, and high performance workplace. Used to READY the workplace for future continuous improvement efforts.

1. **Sort** - distinguish needed items from unneeded; eliminate unneeded
2. **Straighten** - keep needed items in the correct place for easy access
3. **Shine** - keep workplace tidy
4. **Standardize** - method of making the steps above a habit
5. **Sustain** - establish procedures
1. Sort

- Sort out necessary and unnecessary items
  - Tag items for removal or storage
- Store often used items at the work area and infrequently used items away from the work area
2. Straighten

- Arrange all necessary items
  - Establish locations
    - Naming convention for electronic files
    - Signage for work production and supply areas
      “Visual Work Environment”
  - “A place for everything, everything in its place”
2. Straighten

Distance traveled = 114 ft
48% decrease in distance traveled.

CSU Chancellor's Office Copy Center
Current Process: Electronic Job BOG Binder

Distance traveled = 210 ft
3. Shine

- To keep your area clean on a continuing basis
  - Physically clean
  - Clean electronic folders on a regular basis; no outdated versions
    - Can a colleague find it
  - No unused icons/shortcuts
4. Standardize

• To maintain guidelines – Sort, Straighten and Sweep
  – Develop schedules, checklists, audits, information boards
  – Periodically evaluate area using 5S spreadsheet
    – Workgroup agrees on naming conventions, where to save/store/retrieve data

• Prevents regression back to an unclean/disorganized environment (return items to where they belong)

• Continually improve neatness
4. Standardize

**5S AUDIT CHECKLIST**

<table>
<thead>
<tr>
<th>AREA:</th>
<th>Work Area</th>
<th>DATE:</th>
<th>10 Jul 06</th>
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<table>
<thead>
<tr>
<th></th>
<th>SORT</th>
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<th>STANDARDIZE</th>
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<th>TOTAL</th>
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<td>9</td>
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<td>0.9</td>
<td>0.3</td>
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**SCORING GUIDELINES**

<table>
<thead>
<tr>
<th>0</th>
<th>ZERO EFFORT</th>
<th>1</th>
<th>SLIGHT EFFORT</th>
<th>2</th>
<th>MODERATE EFFORT</th>
<th>3</th>
<th>MINIMUM ACCEPTABLE LEVEL</th>
<th>3.5 (4) ABOVE AVERAGE RESULTS (AUDITS)</th>
<th>4.5 (5) OUTSTANDING RESULTS (AUDITS)</th>
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**SORT ACTIVITY DESCRIPTIONS**

1. Only the required spare parts, materials, WIP, etc., are present at the workstation. Items not required to make the current product are removed from the workplace.

2. Only the required tools are present at the workstation. Items not required to make the current product are removed from the workplace.

3. Only the required paperwork is present at the workstation. Out-dated or otherwise unnecessary posters, memos, announcements, reports, etc. are removed from the workplace.
5. Sustain

• To maintain discipline, we need to practice and repeat until it becomes a way of life
  – Training everyone is vital
  – Involvement from all is necessary

• To build housekeeping into every day process
  – Commitment and discipline toward housekeeping is essential in taking the first step in being World Class
Benefits of 5S

- Organized workplace
- Reduces stress
- Reduces waste
- More pleasant place to work
- Credibility/impress customers
- Safer work environment
- Foundation for other improvement projects
What is Waste?

• The elements of an activity that do not add value from the customer perspective
• Adds cost & time
Addressing Waste

Address the underlying problems (causes of waste) to improve performance:

1. Correction/Rework
2. Overproduction
3. Unnecessary Movement of Items/Materials
4. Unneeded Motion
5. Waiting
6. Inventory
7. Over-Processing/Complexity
8. Underutilization of Resources
Addressing Waste

1. **Correction/Rework:** Errors or mistakes; not doing it right the first time. Additional work or resources necessary to correct, rework or otherwise mitigate defects and mistakes.

   • Ask:
     - Do we have data entry errors, typos?
     - Do we have billing, or coding errors?
     - Do we forward incomplete documentation to the next process?
     - Do we receive incorrect information on a document?
     - Do we ever lose files or records?
     - Are your email distribution lists up-to-date?
     - Are instructions or requirements unclear or confusing?
Addressing Waste

2. **Overproduction**: Producing more of an item than is needed.

• Ask:
  – Are we producing more reports than needed? ARE they needed?
  – Are we making extra copies? ARE they needed?
  – Are we printing, faxing, emailing more than what is needed?
  – Are we entering repetitive information on multiple work documents or forms?
  – Are we doing more work than requested?
3. **Unnecessary Movement of Items/Materials**: Unneeded travel or movement of materials used when producing an item.

- **Ask:**
  - Are you delivering/routing documents that are not required?
  - Are you doing excessive filing of work documents that will never be used again?
4. **Unneeded Motion**: Unnecessary motion required by a worker to complete a task.

- Ask:
  - Are you searching for computer files on your desktop? Unable to find or too many layers in electronic files?
  - Are you searching for work documents (files) in cabinets and/or drawers? Digging through stacks of paper?
  - Are you hand-carrying paper work to another process or department regularly?
  - Are you walking to a copier or printer?
  - Are you spending a lot of time traveling to meetings?
Addressing Waste

5. **Waiting**: Idle time while individuals wait for work to arrive; customers waiting for service.

- **Ask:**
  - Are there bottlenecks?
  - Are there excessive signatures or approvals required? (long approval cycles)
  - Is there too much dependency on others to complete a task?
  - Are there cross-departmental resource commitments issues? How do they know how to prioritize?
  - Are there delays in receiving information?
  - Is there time spent waiting for decisions?
  - Are there system downtimes, slow systems?
Addressing Waste

6. **Inventory**: Excessive inventory that ties up space and capital.

• Ask:
  – Are files (work) sitting in an inbox (backlog of work)?
  – Are we processing information in batches?
  – Are we purchasing excessive supplies of any kind?
  – Do we have any obsolete files/folders/equipment in the area?
Addressing Waste

7. **Over-Processing/Complexity**: Doing more work than is necessary to complete a task.

- **Ask:**
  - Are we doing more work than is required for that process? (too many process steps)
  - Are Job descriptions/work processes clear?
  - Are we receiving unclear reports/memos?
  - Are we duplicating reports or information?
  - Are we entering repetitive data?
  - Are we producing repetitive documents from scratch?
Addressing Waste

8. **Underutilization of Resources**: Not getting what is possible from people, processes and resources. Limiting worker authority or responsibility. Inadequate resources to do the job. Inadequate training or education for workers.

• **Ask:**
  – Are we in positions we were trained to do?
  – Can we assist other areas when work is slow in our primary area?
  – Can we be trained to do more within the organization? (Cross training)
To Increase Output, Waste Must be Addressed
Use Continuous Improvement to Increase Value Added Work
Defining/Identifying Current Process
# As – Is Process: Steps & Tools

<table>
<thead>
<tr>
<th>Purpose/Steps</th>
<th>Tools - What &amp; How</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common Understanding of Big Picture</td>
<td>SIPOC</td>
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</tbody>
</table>
| Detailed Common Understanding of CURRENT Process  | Top Down Flow Diagram
                                                         Cross Functional Flow Chart
                                                         Value Stream Map
                                                         Walk the Process
                                                         Obtain Customer/User Perspective |
| Quantify, Confirm, Understand                      | Baseline Data Collection                                                          |
SIPOC

<table>
<thead>
<tr>
<th>Suppliers</th>
<th>Inputs</th>
<th>Processes</th>
<th>Outputs</th>
<th>Customers</th>
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</thead>
<tbody>
<tr>
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<td>companies, or</td>
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<td>or individuals</td>
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<td>etc.</td>
<td>your services.</td>
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<td>the processes.</td>
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</table>
SIPOC

• High-level view of the organization
• Use when existing process has more significant changes to reach a new level of performance
• Depicts Suppliers, Inputs, Process, Outputs, Customer
• Leads to discussion and identification of:
  – Customer needs, priorities and view of performance
  – Main performance gaps and process shortcomings
<table>
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<th>Customers</th>
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<tbody>
<tr>
<td>SNAP</td>
<td>Software</td>
<td>Translate requirements into survey form</td>
<td>Survey form</td>
<td>Campus department functional representative</td>
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<td>CO Web Services</td>
<td>Host</td>
<td>Develop sampling plan</td>
<td>Survey links</td>
<td>Campus administration</td>
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<tr>
<td>Communications</td>
<td>Advice</td>
<td>Schedule &amp; manage survey deployment</td>
<td>Email invitations</td>
<td>Faculty members</td>
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<tr>
<td>Campus functional representatives</td>
<td>Dept needs &amp; questions</td>
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<td>Reports</td>
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<td>On-campus presentations and consulting</td>
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<tr>
<td>Campus IT staff</td>
<td>Email lists</td>
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<td>Server access</td>
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</table>

- **Translate requirements into survey form**
- **Develop sampling plan**
- **Schedule & manage survey deployment**
- **Download data**
- **Analysis & report production**
Process Mapping
What is a Process?

A process describes a sequence of events required to get results.
Process Thinking at Toyota

“Brilliant process management is our strategy.

We get brilliant results from average people managing brilliant processes.

We observe that our competitors often get average (or worse) results from brilliant people managing broken processes.”
What is Process Mapping?

• A graphical representation of how work is done that shows tasks in sequence and makes work visible
• Clarifies roles and responsibilities
  – What activities are completed by whom and in what sequence
Why Process Mapping?

- Orient and train employees and customers
- Improve a process:
  - Identify opportunities for improvement
  - Streamline activities and eliminate redundancies
  - Automate processes
  - Identify metrics (costs, resource allocation etc.) to improve
Why are there Process Issues?

• Process was not designed well initially
• Customer needs changed but process did not
• Technology changed but process did not
• Process was changed over time
  – Added steps, approvals, checks on accuracy
• Process dependent on a few individuals but not documented
Why are there Process Issues?

- Process owners rarely take/have the time to review a process
- Those working on a process don’t have a mechanism to fix the process
How to Map a Process

• Identify process name & owner
• Write AS-IS on map
• Identify start and stop points
• Show all the process activities
  – Most processes have exceptions; map what happens 80% of the time
• Don’t try to fix- document current process
  – Notate areas of concern/ideas/ possible solutions that come up
• You will utilize different flowcharts depending on the amount of detail needed and what you are trying to accomplish:
  – Top Down Flowchart
  – Cross Functional Flowchart
How to Map a Process

There is more than one way to gather information

• Individual
  – One person knowledgeable with the process independently creates the flowchart
    – Presents it to others familiar with the process, asks for input, revises as necessary

• Interviews, surveys & observations
  – One person interviews people who work the process
    – Interview current or former students
    – Focus groups with faculty or student
  – Direct Observation
    – Shadow a student as he scheduled and met with his advisor
    – Customer satisfaction surveys

• Group process
  – Assemble people who work in or with the process
Top Down Flowchart

Start Point:
Stop Point:

Process Step 1
- Sub Step 1
- Sub Step 2
- Sub Step 3
- Sub Step 4

Process Step 2
- Sub Step 1
- Sub Step 2
- Sub Step 3
- Sub Step 4

Process Step 3
- Sub Step 1
- Sub Step 2
- Sub Step 3
- Sub Step 4
Top Down Flowchart: Travel Expense Report Reimbursement

Start: Traveler fills out and submits expense report
Stop: Traveler is reimbursed

- Traveler fills out expense report in Excel
- Traveler prints the report
- Traveler sends report to manager for approval
- Manager approves the report
- Manager mails report to the Travel Desk

- Travel Desk performs audit
- Travel Desk inputs data into PeopleSoft
- Accounts Payable verifies that data was input correctly into PeopleSoft
- Travel Desk performs budget check in PeopleSoft
- Travel Desk prints checks and attaches to expense report
- Accounts Payable Scans report into imaging system and mails check to Traveler
Top Down Flowchart

• Why top down?
  – Display major process areas and steps
  – Gain consensus on process; begin to see a picture of the current state process
  – Indication of potential process issues; start to identify non value added steps
  – Can be used for training or planning a speech
  – Visual for customers to help them understand process
  – Focus on essential, value added steps

• Downside
  – Macro level tool, lacking specifics
  – Hard to measure, unable to see rework
  – Does not indicate handoffs between departments
Top Down Flowchart

• Procedure
  – Define start and stop points
  – List the main steps (4-12)
  – Arrange them in order
  – Identify key tasks under each step

• Class exercise:
  – Getting to work in the morning
Cross Functional Flowchart

Travel Reimbursement Process

Traveler
- Submit Travel Claim
  - Sign Travel Claim to Approve Payment
    - No
    - Yes Is form complete?
      - Enter Information into system
        - Verify information entered Correctly
          - Budget Check
            - Print and mail check
  - Receive Reimbursement
Basic Charting Symbols

Start/End: Identifies beginning and end of processes

Activity steps. Name of an activity, person, role, task or operation

Identifies a decision or branch point. Accept/reject, yes/no, complete/incomplete etc.

Sub-process that may be separately mapped

Arrows: Indicates the direction of progression of the process

Connectors: Output from this flowchart will be an “input” to another flowchart
Cross Functional Flowchart

• Why Cross Functional?
  – Display process steps and current process
  – View department relationships and handoffs
  – Helps clarify roles in addition to the flow of events
  – Indicates potential areas of delay or rework
  – Identify baseline metrics
  – Can be used for improvement or training effort

• Downside
  – It is important to know this process is part of a greater system and to consider any downstream affects as a result of changes you make in your process
Create Cross Functional Flowchart

• Procedure

  – Write name of process and AS-IS at top of map
  – Identify and write on two post-it notes, the start and stop points (also indicate at top of sheet)
  – On the left vertical axis list the departments/functional areas involved in order of appearance (use post-it notes)
  – Draw swim lanes between departments/functional areas
  – List each step on a sticky note and place in the proper order over time (left to right)
  – Pencil in arrows
  – Identify potential current state metrics, i.e., time per step, time in between step, total process time, number of steps, number of lane crossings
  – Do not attempt to solve issues at this point, make note of things that come up but focus on the current state!
Create Cross Functional Flowchart

• Group Exercise
  – Map the new hire process
Process Measures

Objective:

- Identify baseline metrics as basis of comparison to potential future state (helps identify if worth effort to improve) or actual future state (helps identify if changes were successful or if further changes needed)

What to watch out for:

- Are you using meaningful data?
- If you collect data use it!
- Don’t measure too many things
- Measure what is helpful not what is convenient
- Measure only what is important to your stakeholders & customers
  - There are no predefined set of measures for all processes: identify measures that capture the expectations of the customer!
Process Measures

- **Cost** - operational cost; effort to maintain/enhance/support; direct staff costs; management cost; cost of defects
- **Performance** - system response time; amount of backlog; % of rework; customer feedback (complaints and compliments)
- **Total process time** – beginning to end of process
- **Total number of steps**
- **Time for each step and between steps** – waiting; idle
- **Percent value added time** – percent of total time spent on adding value
- **Involvement** - number of people and hours of involvement; departments; locations; number of handoffs between departments
Process Measures

• Problems must be quantified, exposed and confronted; lean cannot address an unacknowledged issue
• If you can measure it, you can change it
• MEASURE RESULTS, not effort and process compliance

Your recommendations are only as good as your analysis; your analysis is only as good as your data; your data is only as good as your measurement system…DATA INTEGRITY IS THE FOUNDATION OF A CREDIBLE PROJECT
Analyzing Flowcharts for Improvement Opportunities

<table>
<thead>
<tr>
<th>Process Improvement</th>
<th>Process Reengineering</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AS IS</strong> Current State</td>
<td><strong>SHOULD BE</strong> Future State</td>
</tr>
</tbody>
</table>
# To-Be Process: Steps & Tools

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<thead>
<tr>
<th>Purpose/Steps</th>
<th>Tools - What &amp; How</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understand and document customer needs</td>
<td>Understand &amp; document the customer needs</td>
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<tr>
<td></td>
<td>Identify the characteristics that meet those needs</td>
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<tr>
<td>Identify Issues &amp; Summarize Root Causes</td>
<td>Process Review elimination of Waste &amp; Non Value Added Activities – 5 Whys</td>
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<td>Internal/External Benchmarking</td>
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<tr>
<td>Identify &amp; Document Possible Solutions</td>
<td>Future State Flow Diagrams</td>
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<tr>
<td></td>
<td>- Top Down Flow Diagram</td>
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<tr>
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<td>- Cross Functional Flow Chart</td>
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<td>- Value Stream Map</td>
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<tr>
<td>Once Design and Project are Approved, Ensure</td>
<td>Communication &amp; Engagement Plans</td>
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<tr>
<td>Effective Adoption</td>
<td>Training Materials</td>
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<td>Process Measures</td>
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</table>
Analyzing Flowcharts for Improvement Opportunities

• Identify future state ‘should be’ map
  – Where you can be in 30/60/90 days with current resources

• Identify ideal state ‘could be’ map
  – Longer term with automation/technology or other resources/infrastructure not yet in place
  – Consider strategic vision and where organization/department wants to be
Analyzing Flowcharts for Improvement Opportunities

• What to look for:
  - Any activity that is not important to the customer
  - Waste or non value added steps: delays, rework, storage, etc.
  - Frequently repeated steps: inspections, rework, signatures, etc.
  - No control points: need to add inspections & decisions
  - Optimal positioning of process participants
  - Excessive hand offs / lane changes
Analyzing Flowcharts for Improvement Opportunities

• Improve the process:
  – Clarify handoffs: what’s needed by whom, when, why
  – Clarify steps that are not understood
  – Reorder steps to be more logical
  – Minimize motion and distance traveled
  – Minimize time to perform a task
  – Ensure appropriate resources are used/available
  – Ensure appropriate amounts are produced/worked

• Activities can be….
  - Combined
  - Run concurrently, instead in serial
  - Made faster or reduce labor required via automation
  - Eliminated if proven to be unnecessary
  - Add steps if they are early and prevent rework later
Analyzing Flowcharts for Improvement Opportunities

Continually ask ‘why this activity/step is necessary’
Value Stream Mapping (VSM)
What is a Value Stream?

A value stream is all the steps, both value creating and non value creating, required to complete a product or service from beginning to end.
VSM: It’s Not Just Another Processing Mapping Tool!

- Uses a systems perspective
- Focuses on customer requirements
- Links work and information flow
- Documents delivery and quality performance
- Highlights problems
- Allows process redesign to meet specific agreed-upon objectives
Value Stream Mapping: Why

VSM helps us:

• understand **how** the process **works** now and **how well** it’s working
• expose waste and problems with flow in the value stream
• reach agreements on what changes need to be made to improve the process
• reach agreements on how to ensure that those changes are made
Understanding Flow

In the flow of value, there can be many obstacles!

- Unnecessary Documents
- Unnecessary Queues and Wait Times
- Multiple Approvals
- Inadequate Resources

Value

Customer
Identify Areas to Improve

FLOW

Process 1

1-2 days

Process 2

3-14 days

Inbox

CUSTOMER

Improvement

Countermeasure
Individual Efficiency vs. System Effectiveness

Rowing twice as fast
A VSM is a **simple tool** that visually represents what’s going on in a value stream.
Typical VSM Icons

- Process (symbol is a person)
- Customer or Supplier
- Push Arrow
- Inventory (ex. inbox, batch)
- Manual Information
- Electronic Information
- Data Table
- Production Control
Current-State – Travel and Expense Reimbursement Process

Start: Traveler fills out and submits expense report
End: Traveler is reimbursed
Date: 6/9/2010

Value Stream Metrics

- Process Time = 44 minutes
- Lead Time = 19 days 44 minutes
- Percent Complete & Accurate = 37%
- # of Touches = 7

Customer Requirements:
- Reimbursement check in 7 days

Supplier Input:
- 5 expense reports per day

<table>
<thead>
<tr>
<th>Task</th>
<th>P/T</th>
<th>L/T</th>
<th>%C/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expense Report Audit</td>
<td>10 min.</td>
<td>3 days 10min.</td>
<td>44%</td>
</tr>
<tr>
<td>Manually Key Information into PeopleSoft</td>
<td>7 min.</td>
<td>1 day</td>
<td>99%</td>
</tr>
<tr>
<td>Validate That Data Keyed Correctly into PeopleSoft</td>
<td>7 min.</td>
<td>1 days</td>
<td>95%</td>
</tr>
<tr>
<td>Budget Check/&quot;Post&quot; Expense in PeopleSoft</td>
<td>5 min.</td>
<td>2 days</td>
<td>100%</td>
</tr>
<tr>
<td>Print Check And Attach To Expense Report</td>
<td>5 min.</td>
<td>5 min.</td>
<td>100%</td>
</tr>
<tr>
<td>Scan Hardcopy Expense Report Into Imaging System / Mail Check</td>
<td>5 min.</td>
<td>2-days</td>
<td>100%</td>
</tr>
</tbody>
</table>

- P/T = Process Time
- L/T = Lead Time
- %C/A = Percent Complete & Accurate
- Touch = Number of Touches
Value Stream Map Zones

Read upper-half from right to left

Supplier

Information Flow

Process Boxes

Process Data Boxes (w/metrics)

Timeline & Summary Statistics (value stream metrics)

Read lower-half from left to right
Typical Steps for Current State Mapping

1. Note customer and supplier issues
   - Process output(s) and customer(s)
   - Customer quantity and quality requirements; delivery types
   - Input(s) and supplier(s)
   - Supplier quantity and quality; delivery type(s)

2. Main process steps mapped in sequence

3. Value stream “walk” noting
   - Information flow
   - Technology used
   - Process performance metrics

4. Calculate cumulative range process time (P/T), lead time (L/T), and overall % complete and accurate (%C/A)
Top Down Flowchart: Travel Expense Report Reimbursement

Start: Traveler fills out and submits expense report
End: Traveler is reimbursed

1. Travel Expense Report Submitted
   - Traveler fills out expense report in Excel
   - Traveler prints the report
   - Traveler sends report to manager for approval
   - Manager approves the report
   - Manager mails report to the Travel Desk

2. Audit
   - Travel Desk performs audit

3. Input into PeopleSoft
   - Travel Desk inputs data into PeopleSoft
   - Accounts Payable verifies that data was input correctly into PeopleSoft

4. Budget Check
   - Travel Desk performs budget check in PeopleSoft
   - Travel Desk prints checks and attaches to expense report

5. Traveler Reimbursed
   - Accounts Payable scans report into imaging system and mails check to Traveler
Current-State – Travel and Expense Reimbursement Process

Start: Traveler fills out and submits expense report
End: Traveler is reimbursed
Date: 6/9/2010

Customer Requirements:
Reimbursement check in 7 days

Supplier Input:
5 expense reports per day
Current-State – Travel and Expense Reimbursement Process

Start: Traveler fills out and submits expense report
End: Traveler is reimbursed
Date: 6/9/2010

Customer Requirements:
Reimbursement check in 7 days

Supplier Input:
5 expense reports per day

1. Expense Report Audit
   - Travel Desk

2. Manually Key Information into PeopleSoft
   - Travel Desk

3. Validate That Data Keyed Correctly into PeopleSoft
   - Travel Desk
   - Accounts Payable

4. Budget Check/"Post" Expense in PeopleSoft
   - Travel Desk

5. Print Check And Attach To Expense Report
   - Travel Desk

6. Scan Hardcopy Expense Report Into Imaging System / Mail Check
   - Accounts Payable
Current-State – Travel and Expense Reimbursement Process

Start: Traveler fills out and submits expense report

End: Traveler is reimbursed

Date: 6/9/2010

Customer Requirements: Reimbursement check in 7 days

Supplier Input: 5 expense reports per day

---

1. **Expense Report Audit**
   - Travel Desk
   - Q/1

2. **Manually Key Information into PeopleSoft**
   - Travel Desk
   - Q/1

3. **Validate That Data Keyed Correctly into PeopleSoft**
   - Accounts Payable
   - Q/1

4. **Budget Check**
   - Travel Desk
   - Q/1

5. **Print Check And Attach To Expense Report**
   - Travel Desk
   - Q/1

6. **Scan Hardcopy Expense Report Into Imaging System / Mail Check**
   - Accounts Payable
   - Q/1

---

Control Point
Approver
Submit Printed Expense Report for Signature/Approval

Fill-out expense report and print.

Mail Approved Report
Missing information

Notify Traveler about missing information

Validated

PeopleSoft

Key in Data

Mail Check

Budget Check

Print Check And Attach To Expense Report

Scan Hardcopy Expense Report Into Imaging System / Mail Check
Current-State – Travel and Expense Reimbursement Process

Start: Traveler fills out and submits expense report
End: Traveler is reimbursed
Date: 6/9/2010
Lean Metrics

- **Process Time (P/T)** – actual “touch time” of one work item; exclude interruptions
- **Delay Time (D/T)** – time work item is delayed or not touched
- **Lead Time (L/T)** – start time to finish time; \( L/T = P/T + D/T \)
- **% Complete & Accurate (%C/A)** - % of work entering a process that is complete and accurate
Current-State – Travel and Expense Reimbursement Process

Start: Traveler fills out and submits expense report
End: Traveler is reimbursed
Date: 6/9/2010

Value Stream Metrics

Process Time = 44 minutes
Lead Time = 19 days 44 minutes
Percent Complete & Accurate = 37%
# of Touches = 7

Control Point

Approver

Customer Requirements:
Reimbursement check in 7 days

Supplier Input:
5 expense reports per day

Inbox 30 reports 5 days

Expense Report Audit
Travel Desk

P/T = 10 min.
D/T = 0-3 days
%C/A = 44%
Touch = 1

Manually Key Information into PeopleSoft
Travel Desk

P/T = 7 min.
D/T = 0 days
%C/A = 99%
Touch = 1

Validate That Data Keyed Correctly into PeopleSoft
Accounts Payable

P/T = 7 min.
D/T = 0 days
%C/A = 95%
Touch = 1

Budget Check

Post Expense in PeopleSoft

P/T = 5 min.
D/T = 0 days
%C/A = 100%
Touch = 1

Print Check and Attach To Expense Report
Travel Desk

P/T = 5 min.
D/T = 0 days
%C/A = 100%
Touch = 1

Scan Hardcopy Expense Report Into Imaging System/Mail Check

P/T = 5 min.
D/T = 0 days
%C/A = 100%
Touch = 1

Value Stream Metrics

P/T
10 min. 7 min. 7 min. 5 min. 5 min. 5 min.

L/T
3 days 10min. 1 day 7 min. 1 days 7 min. 2 days 5 min. 5 min. 2-days 5 min.

%C/A
44% 99% 95% 100% 100% 100%
Analyzing the Current State
VSM: What’s a Problem?

A “problem” is… the gap between the way things are now and the way they’re supposed to be, or you want them to be, in the future.
Problem Categories

To improve a process look for problems in:

• Meeting customer requirements
• Making work flow
• Doing the work
• Managing to improve and learn
Using the “5 Whys” to Identify Root Causes

1. Document all potential root causes
2. Ask if any causes are more likely the root than the other
3. “Drill down” by asking “why” on most likely root causes

When using “5 Whys?” ask the following…
- Do you think this is the root cause?
- Should we ask why again?
- Does it matter any more?

Employees are unhappy because their 7-day reimbursement requirement is not being met

Expense reports are submitted with errors or incomplete information

Traveler and Approver pass on reports with errors

The procedure does not include self-checks

The procedure was not developed with mistake proofing or self-check steps in mind

Not enough resources (people) to process travel reimbursement

Know when to STOP!
Identifying Current State Problems: Group Activity

1. Review the current state map
2. Write problems on post-its
3. Post problems where they appear on the current state map
4. Don’t solve, just identify!
Current-State – Travel and Expense Reimbursement Process
Start: Traveler fills out and submits expense report
End: Traveler is reimbursed
Date: 6/9/2010

Value Stream Metrics
Process Time = 44 minutes
Lead Time = 19 days 44 minutes
Percent Complete & Accurate = 37%
# of Touches = 7

Approval delay up to 5 days
Approver passing on reports with errors
Control Point
Approver
Are ‘wet’ signatures required?
Printed report for Approval
Fill-out expense report and print
Data starts out electronic and is printed

Customer Requirements:
Reimbursement check in 7 days
Supplier Input:
5 expense reports per day

Batch delay up to 5 days
Manually keying data time consuming
Missing Information

Expense Report Audit
Travel Desk
Validate That Data Keyed Correctly into PeopleSoft
Accounts Payable
Print Check And Attach To Expense Report
Travel Desk
Scan Hardcopy Expense Report Into Imaging System / Mail Check

Low percent correct and accurate

<table>
<thead>
<tr>
<th>Process</th>
<th>Time</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Travel Desk</td>
<td>min. 1 day</td>
<td>%C/A = 99%</td>
</tr>
<tr>
<td>Travel Desk</td>
<td>7 min.</td>
<td>%C/A = 95%</td>
</tr>
<tr>
<td>Travel Desk</td>
<td>7 min.</td>
<td>%C/A = 95%</td>
</tr>
<tr>
<td>Travel Desk</td>
<td>5 min.</td>
<td>%C/A = 100%</td>
</tr>
<tr>
<td>Travel Desk</td>
<td>5 min.</td>
<td>%C/A = 100%</td>
</tr>
<tr>
<td>Travel Desk</td>
<td>5 min.</td>
<td>%C/A = 100%</td>
</tr>
</tbody>
</table>
Current State VSM Reflection

1. What have you learned thus far that changes how you think about your work?
2. What do you need to think/learn more about before you use it?
3. What can you immediately apply to your work?
Current State Mapping Tips

1. Identify the basic process boxes before performing the actual walk through.

2. Identify the metrics that the team will collect for each process box.

3. Add other information (via visual icons or metrics) as you observe the process steps in motion.

4. Guard against making the map too unwieldy; start simply, and add boxes as necessary.
5. Walk the value stream to gather the performance data associated with creating the value.

6. Ask questions regarding activities and issues you see to understand potential barriers in designing future states.

7. Map the whole value stream as a team.

8. Assign team members specific tasks to perform in the mapping process.

9. Always draw by hand and in pencil.
What is a “Lean Value Stream”?

- **Value** - from the perspective of the customer
- **Flow** - no waiting or rework
- **Work** - standardized, built-in quality
- **Monitoring performance** - milestones, checkpoints, and lean metrics
Creating a Future State Map

1. Define customer requirements
2. Determine scope of change
   • Radical vs. incremental
3. Make the work flow
   • Optimize value creating steps
   • Apply appropriate lean tools/approaches
Creating a Future State Map

4. Improve work quality and reliability
   • Control variation
   • Standardize

5. Monitoring performance
   • Milestones
   • Regular checks and reflection
   • Feedback learning

6. Estimate your results
   • Quality and process improvements (% C/A, P/T, L/T)
Quality at the Source

• People must be certain that the product/information they are passing to the next work area is complete and accurate
• People must be given the means to perform inspection at the source, before they pass it along
Techniques for Catching Defects as Close to Source as Possible

• Posted procedures & checklists (for both work steps & quality requirements)
• Self checking (visual confirmations built into work sequence)
• Successive checking (following process checks)
• Mistake proofing (automatic error detection)
• Zone control (checks before leaving the group or area)
• Product checks (final or functional inspection)
• Systems for immediate giving feedback about abnormalities to the processes where they originated
Future-State - Travel and Expense Reimbursement Process

Start: Traveler fills out and submits expense report
End: Traveler is reimbursed
Date: 6/9/2010

Value Stream Metrics
- Process Time = 22 minutes
- Lead Time = 6 days 22 minutes
- Percent Complete & Accurate = 89%
- # of Touches = 2

Control Point
- Approver
  - P/T = 5 min.
  - %C/A = 99%
- Electronic Approvals
  - Electronic Inbox
  - C-2 days
- Notification - Ready for Approval
- Handover Receipts and any Missing Information
- Error checks in PeopleSoft
- Capture data directly in PeopleSoft

Traveler
- Touch = 1
- Customer Requirements: Reimbursement check in 7 days
- Supplier Input: 5 expense reports per day

Expense Report Audit
- Travel Desk
  - P/T = 7 min.
  - D/T = 0-1 day
  - %C/A = 90%
  - Touch = 1

Budget Check
- Travel Desk
  - P/T = 5 min.
  - D/T = 0 days
  - %C/A = 100%

Print Check
- Accounts Payable
  - P/T = 5 min.
  - D/T = 0 days
  - %C/A = 100%

Service-Level Agreement (SLA)
- Electronic Inbox:
  - 1 day

Value Stream Metrics (cont.)

<table>
<thead>
<tr>
<th>P/T</th>
<th>5 min.</th>
</tr>
</thead>
<tbody>
<tr>
<td>L/T</td>
<td>1-5 min.</td>
</tr>
<tr>
<td>%C/A</td>
<td>100%</td>
</tr>
</tbody>
</table>
Current-State – Travel and Expense Reimbursement Process
Start: Traveler fills out and submits expense report
End: Traveler is reimbursed
Date: 6/9/2010

Value Stream Metrics
Process Time = 44 minutes
Lead Time = 19 days 44 minutes
Percent Complete & Accurate = 37%
# of Touches = 7

Customer Requirements:
Reimbursement check in 7 days
Supplier Input:
5 expense reports per day
Summary of Results & Potential Impact

- Entering data directly into PeopleSoft and allowing electronic approvals helped to eliminate data entry and checking steps.
- Service-Level Agreements put in-place to meet customer requirements.
- New **lean** value stream has fewer process steps and automatic error checking.

<table>
<thead>
<tr>
<th>Metric</th>
<th>Current State</th>
<th>Future State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead Time (L/T)</td>
<td>19 days 44 minutes</td>
<td>6 days 22 minutes</td>
</tr>
<tr>
<td>Percent Correct and Accurate (%C/A)</td>
<td>37%</td>
<td>89%</td>
</tr>
<tr>
<td>Process Time (P/T)</td>
<td>44 minutes</td>
<td>22 minutes</td>
</tr>
</tbody>
</table>
Project Identification, Planning & Implementation
Project Selection

Leadership endorsement, dedicated resources, and commitment to change a process that:

1. Consumes too many resources or has significant quality, cost or delivery problems
2. Has a compelling business case
3. Has clear ownership
4. Can be mapped, with defined scope and performance metrics
5. Is worth the time and effort to improve
Project Selection

- Broken processes/processes in crises may already be known and identified
- Projects can also be identified and prioritized by conducting organizational assessments and surveys
- Selection criteria will depend on organization
  - Low hanging fruit
  - High impact on students
  - Where is support?
    - Organizational wide project vs Individual department
Project Charter

1. Process, problem statement
2. Project objective
3. Process owner, project scope - in scope/out of scope
4. Suppliers, inputs, process steps, outputs, customers (SIPOC)
5. Issues, impacts, benefits
6. Stakeholders, workshop participants, decision panel
7. Project schedule
Planning & Implementation

The specific changes needed to move from current state to future state are what you need to plan for.

The Action Steps are how you will get there.
What is a Plan?

A set of agreements for making a change or series of changes
Some Common Problems in Planning

- Lack of continued support from leaders
- Failure to address internal conflicts that get in way of change effort
- Failure to make compelling case for need to change
  - Can be demonstrated in reduction of steps, $$ saved, show savings offset any purchasing costs
- Solutions identified without clear understanding of the problem
- Responsibilities and deliverable specifics not clear
- Plan in silos
- Underestimate the time and effort required to implement
- Reviews not part of the plan
What do you need to have Agreement on to have a Plan?

1. **Implementation Goals** - necessary changes that you’ve identified in the current state
2. **Action Steps** - tasks needed to make each change happen
3. **Responsible Person(s)** - participant(s) in the workshop who will serve as a leader to ensure completion of a goal and/or action steps
4. **Target(s)** - measurement indicating that a goal or action step has been achieved
5. **Timeline** - beginning and ending dates for the overall project and individual action steps
6. **Support** - people who will help or provide resources
7. **Review/Control Points** - scheduled points during and after the implementation to review whether it went as planned and achieved the intended results
Goals vs. Actions

A goal is not the same as an action. It is an outcome or new condition that needs to be achieved.

An action is what you do to get the outcome (your real purpose).

You need commitment to the outcome ----not just to the action.
Future-State – Travel and Expense Reimbursement Process

Start: Traveler fills out and submits expense report
End: Traveler is reimbursed
Date: 6/9/2010

Value Stream Metrics
- Process Time = 22 minutes
- Lead Time = 6 days 22 minutes
- Percent Complete & Accurate = 89%
- # of Touches = 2

Service-Level Agreement (SLA)
- Electronic Inbox 10 reports 2 days

Expense Report Audit
- Travel Desk
- P/T = 7 min.
- D/T = 0-1 day
- %C/A = 90%
- Touch = 1

Control Point
- Approver
- P/T = 5 min.
- %C/A = 99%

Customer Requirements:
- Reimbursement check in 7 days

Supplier Input:
- 5 expense reports per day

Error checks directly in PeopleSoft
- Capture data and scanned receipts into PeopleSoft

Electronic Approvals
- Touch = 1
- Electronic Inbox 0-2 days

Budget Check
- “Post” Expense in PeopleSoft
- Travel Desk
- P/T = 5 min.
- D/T = 0 days
- %C/A = 100%

Print Check
- Accounts Payable
- P/T = 5 min.
- D/T = 0 days
- %C/A = 100%

Service-Level Agreement (SLA)
- Electronic Inbox 1 day

P/T 7 min. 5 min. 5 min.
L/T 1 day 7 min. 5 min. 1-day 5 min.
%C/A 90% 100% 100%
Implementation Planning
Clarify the Goals

1. Identify the scope of the future state to be achieved in first implementation project and set project completion date
2. Identify the major changes required to move from the current state to the future state on future state map
3. State each change as a goal (use verbs such as decrease, increase, eliminate, create, establish), including the purpose for the change
4. State targets for each change
   • Timing (start and completion)
   • Impact (how much, how many, or how well – if appropriate)
5. Sequence the goals (changes) working back from project completion date
6. Assign responsibility for each goal to a workshop participant
7. Identify necessary support
Planning Tool #1: Project Goals

Goal (the change to be made + the purpose for the change):
Capture Traveler expense report data directly into PeopleSoft in order to increase accuracy, use electronic routing and use built-in error checking.

Targets (Measureable/observable impact & timing):
100% input directly into PeopleSoft by the Traveler by June 2011.
90% Correct & Accurate reports received by the Travel Desk by July 2011

Responsible:  Sally
Support:  Ruth
Implementation Planning:
Develop Action Plans for Each Goal

1. In breakout groups, brainstorm a list of action steps for each goal on a flip chart with post-it notes
2. Sequence the action steps working back from the due date for the goal
3. Set targets for each action step
   - Timing (start & completion)
   - Impact: how much, how many, how well (optional)
4. Assign responsibility for each action step to a workshop participant; assign support (if necessary)
5. Set review dates at key milestones (e.g. at 30/60/90 days)
6. Estimate your required resources
Planning Tool #2: Action Plan

- Capture Traveler expense report data directly into PeopleSoft in order to increase accuracy, use electronic routing and use built-in error checking
- 90% Correct & Accurate reports received by the Travel Desk by July 2011

<table>
<thead>
<tr>
<th>Action Step/Task</th>
<th>Responsible</th>
<th>Timing / Target</th>
<th>Support / Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Design the process map for the PeopleSoft Travel Module</td>
<td>Sally</td>
<td>March 1</td>
<td>Select module functions</td>
</tr>
<tr>
<td>2. Identify/Program error checking</td>
<td>Lena</td>
<td>April 15</td>
<td>Review most common errors</td>
</tr>
<tr>
<td>3. Conduct training for end-users</td>
<td>Alex</td>
<td>May 6</td>
<td>Gina</td>
</tr>
<tr>
<td>Etc…….</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Plan

Goal 1

Goal 2

Goal 3

30 day

60 day

90 day

Actions

Actions

Actions

Actions

Actions
A Project Tracking Center

- A document board in a highly visible area as close to the work area as possible
- Current State and Future State Maps
- Timelines
  - Master schedule for the project
  - Action plans for the changes
- Key Measures of Progress & Success
  - Value stream performance improvement indicators
  - Implementation progress & impact at the process level
- Other documents as required (as few as possible)
  - Roles and responsibilities
  - Review schedules
  - Countermeasure sheets
Example Tracking Center

**Goals**

<table>
<thead>
<tr>
<th>Widget Systems User Guide</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Installation</td>
</tr>
<tr>
<td>Welcome to the under-the-radar guide of an imaginary product.</td>
</tr>
<tr>
<td>1.1. Setting up your computer</td>
</tr>
<tr>
<td>This paragraph has no meaning. Well at least its gibberishnak, which is normally meaningless.</td>
</tr>
<tr>
<td>1.2. Setting up your server</td>
</tr>
<tr>
<td>I should really use an actual example of a user guide.</td>
</tr>
<tr>
<td>1.2.1. Setting up a Data Warehouse</td>
</tr>
<tr>
<td>The Series 300 model basically sets up itself, but book up to the computer and press.</td>
</tr>
<tr>
<td>1.2.2. Setting up a Series 60 Would</td>
</tr>
<tr>
<td>Follow these steps to an up a series 602 model. Remember, California is the key. A clichéd moronic is a helpful moronic.</td>
</tr>
<tr>
<td>2. Maintenance</td>
</tr>
</tbody>
</table>

**30/60/90 Plan**

<table>
<thead>
<tr>
<th></th>
<th>Jan</th>
<th>Feb</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Requirements gathering</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✔</td>
</tr>
<tr>
<td>2. Draft design</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✔</td>
</tr>
<tr>
<td>3. Issue program log tools</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✔</td>
</tr>
<tr>
<td>4. Draft software</td>
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<td>6. Implement program</td>
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<td>7. Testing</td>
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<td>8. Proposal writing</td>
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<td>9. Progress report writing</td>
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**Key Measures of Progress**

**Current State**

**Future State**

**Scheduled Reviews**
Current-State – Travel and Expense Reimbursement Process

Start: Traveler fills out and submits expense report
End: Traveler is reimbursed
Date: 6/9/2010

Value Stream Metrics
Process Time = 44 minutes
Lead Time = 19 days 44 minutes
Percent Complete & Accurate = 37%
# of Touches = 7

Approval delay up to 5 days
Control Point
Approvers

Are ‘wet’ signatures required?

Rework due to missing information

Manually keying data time consuming

Batch delay up to 5 days

Expense Report Audit
Travel Desk

Validate That Data Keyed Correctly into PeopleSoft
Travel Desk

Budget Check/ “Post” Expense in PeopleSoft
Travel Desk

Print Check And Attach To Expense Report
Travel Desk

Scan Hardcopy Expense Report Into Imaging System / Mail Check

Supplier Input:
5 expense reports per day

Low percent correct and accurate

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<th>C/A</th>
<th>Touch</th>
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A3 Template for Problem Solving

• “A3” is just a paper size (international 11x17)
• A3 planning began in the 1960s as the Quality Circle problem-solving format
• At Toyota, it evolved to become the standard format for problem-solving, proposals, plans and status reviews
• The purpose of the A3 process is to:
  – structure effective and efficient dialogue
  – foster understanding followed by Agreement
A3 Format for Problem Solving

• The format is not as important as the process behind it and the conversations it facilitates
• An A3 lays out an entire plan, large or small, on a single sheet of paper
• It should be visual and concise
• It should tell a story, laid out like newspaper columns, which anyone can understand
Step 1: Background
- What are we trying to do with this process?
- Give some background information about the problem.
- Give an explanation to better understand the problem.
- State the importance of the problem.

Step 2: Current Conditions
- Draw a diagram of the current condition.
- Highlight the problem(s).
- Use data to explain the extent of the problem(s).

Step 3: Root-Cause Analysis
- Collect and analyze data to identify the root cause(s).
- Consider what techniques are most useful for explaining root-cause insight:
  Use the 5 Why's?
  Summarize the main findings of the root-cause analysis, visually, if possible.

Step 4: Target Condition
- Draw a diagram of target/improved process.
- Identify where the root causes/waste is being eliminated.
- Define any measurable targets to support proposed improvement.

Step 5: Countermeasures
- What specific actions are required to eliminate the problem(s)?

Step 6: Implement
- When?
- Who?
- What?
- Date/Time
- Person responsible for action items?
- Action items to be completed?

Step 7: Evaluate
- Check the results. Did the improvement(s) work?
- Collect data and compare "before" and "after" results.

Step 8: Follow-Up (Actions)
- What follow-up activities must occur to sustain the results?
- Schedule follow up meetings at 30/60/90 days after implementation
- Did you complete all action items by the 30 day milestone?
- Did you complete all action items by the 60 day milestone?
- Did you complete all action items by the 90 day milestone?
- Has the problem been eliminated and the process showing measurable improvements?
- Can you close this Problem Solving process and archive it as “Completed and Closed”?
P-D-C-A Cycle
Step 1: Background

- What are we trying to do with this process?
- Give some background information about the problem
- Give an explanation to better understand the problem
- State the importance of the problem
Step 2: Current Conditions

• Draw a diagram of the current condition
• Highlight the problem(s)
• Use data to explain the extent of the problem(s)
Step 3: Root-Cause Analysis

• Collect and analyze data to identify the root cause(s)
• Consider what techniques are most useful for explaining root-cause insight:
  – Use the 5 Whys?
• Summarize the main findings of the root-cause analysis, visually, if possible
Step 4: Target Condition

- Draw a diagram of target/improved process
- Identify where the root causes/waste is being eliminated
- Define any measurable targets to support proposed improvement
Step 5: Countermeasures

• What specific actions are required to eliminate the problem(s)?
Step 6: Implement

- **When?** - Date/Time
- **Who?** - Person responsible for action items
- **What?** - Action items to be completed?
Step 7: Effect Confirmation (Results)

• Check the results: did the improvement(s) work?
• Collect data and compare “before” and “after” results
Step 8: Follow-Up (Actions)

• What follow up activities must occur to sustain the results?
• Schedule follow up meetings at 30/60/90 days after implementation
• Did you complete all action items by the 30 day milestone?
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• Can you close this Problem Solving process and archive it as “Completed and Closed”? 
A3 Benefits

- It forces you to slow down and not jump to conclusions
- It fosters dialogue within the organization
- It develops thinking problem-solvers
- It exposes lack of agreement that can undermine plans
- It encourages PDCA (Plan, Do, Check, Act)
- It clarifies the link (or lack of link) among problems, root causes, countermeasures
Organizational Change
Managing Toward Perfection

- Current State
- Future State
- Next Future State
- Original State
Organizational Change Challenges

• Perceived resistance to change
  – People are willing to change, just need a compelling reason
  – Show how change benefits them and solves their problem
    – How does change help students?
  – Allowing employees input in process improvement effort may enrich jobs and enhance own satisfaction
  – Address any perceived threats to jobs – do not use Lean to reduce workforce!

• University culture may not be set up to continuously improve
  – Employees know process is ‘broken’ but there is no formal mechanism to share suggestions
Organizational Change Solutions

• Ask:
  – What are some low-hanging fruit?
  – What can be done immediately to improve customer satisfaction?

• Look to:
  – Create a culture of continuous improvement
    – Communicate improvements to gain momentum for future efforts
  – Remove silos: if a process crosses divisions an improvement by one department may have negative upstream/downstream consequences: COULD MAKE PROCESS LESS EFFICIENT
  – Solicit and accept feedback
  – Have no fear of failure
Leadership’s Role

• Create vision
  – Where are we going and why?
  – Goals and objectives
• Participate in the process
• Commit resources
• Remove barriers
• Communicate
  – Vision, results, lessons learned, and desire for culture of continuous improvement
President Cho of Toyota: Three Keys to Lean Leadership

• Go see
  – Senior Management must spent time on the ground observing the process
    – “You can observe a lot by just watching” – Yogi Berra

• Ask why
  – “Use the “Why?” technique daily”

• Show respect
  – “Respect your people”
  – Harness their creativity to solve problems
Continuing the Quality Journey

• Organizations & Resources
  – ASQ www.asq.org
  – NCCI (Higher Ed) http://www.ncci-cu.org
  – Lean Enterprise Institute www.lean.org
  – CCE (California) www.calexcellence.org

• Certifications
  – ASQ
    – Certified Manager of Quality/Organizational Excellence
    – Quality process Analyst
  – PMI www.pmi.org
    – PMP
Slide Content Adapted from:

- Lean Higher Education: Increasing the Value and Performance of University Processes by William K. Balzer
- Lean Thinking: Banish Waste and Create Wealth in Your Corporation by James P. Womack and Daniel T. Jones
- Lean Thinking with Six Sigma presentation by Kurt E. Robertson
- Learning to See: Value Stream Mapping to Add Value and Eliminate MUDA by Mike Rother, John Shook, Jim Womack and Dan Jones
- Mapping to See Participant Guide by Beau Keyte
- Managing to Learn: Using the A3 Management Process by John Shook
- The Machine That Changed the World: The Story of Lean Production by James P. Womack, Daniel T. Jones and Daniel Roos
- The Basics of Process Mapping by Robert Damelio
- The Team Handbook by Peter Scholtes
- The Complete Lean Enterprise: Value Stream Mapping for Administrative and Office Processes by Beau Keyte and Drew Locher
- The New Lean Office Training Set by Don Tapping
- Understanding A3 Thinking: A Critical Component of Toyota's PDCA Management System by Durward K. Sóbek II. and Art Smalley
- The Kaizen Event Planner by Karen Martin and Mike Osterling
- Lean in Government Starter Kit Version 2.0 from the United States Environmental Protection Agency