
Business Process Improvement

also known as

Process Mapping, Lean, Kaizen....



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Quality Initiatives

Presentation Objectives

- What does it take to improve?
- Describe basic concepts Business Process Improvement (BPI)
- Describe typical process problems & types of waste
- Understand key parts of a project charter
- Understand how electronic workflow systems contribute to BPI
- Identify a few problems or opportunities you could work on

Home Remodel



Quiz: Home Remodel & BPI

- What does it really take to get it done?
- How many people need to be involved?
- What skills do the people need to have?
- What tools will they need?
- How long is it going to take?

Home Remodel - People & Skills



Home Remodel - Tools



What's Involved in BPI?

Philosophy & Context

Organization-wide or “Total.”
Customer focused.
Continuous. Systems view....

Culture or Climate

Leadership. Experience in BPI.
Time & Resources. Facilitative....

Approaches

Plan - Improve - Control
e.g. PDCA, DMAIC, Lean, 5S....

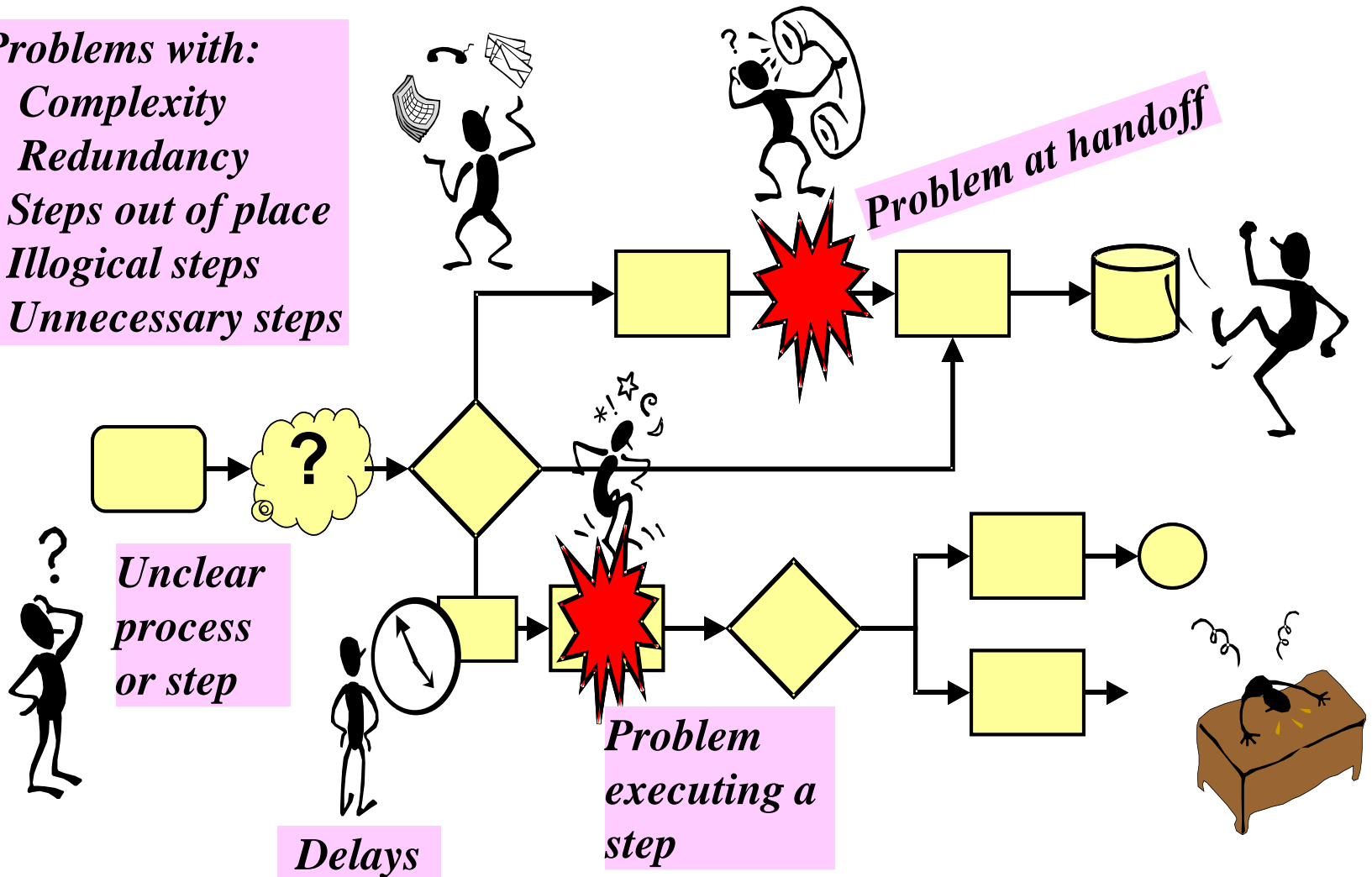
Tools & Techniques

Process Maps, Histograms, Pareto
Charts, Data Collection, Cause &
Effect Analysis, Decision Models,
Statistical analysis, Effective
Group management techniques....

Typical Problems in Processes

Problems with:

- Complexity
- Redundancy
- Steps out of place
- Illogical steps
- Unnecessary steps



The Majority of problems and errors are the result of systems issues, not bad people or lack of motivation.

Types of Waste *Affect Internal & External Customers*

Unnecessary Processing

Doing non-essential work. Unneeded steps or approvals. Identical documents created from scratch.

Unnecessary Motion

Unneeded motion by people. Seeking information or resources. Longer route that is needed due to poor layout.

Transportation

Information or materials moved through work process unnecessarily.

Excess Inventory

More than minimum needed. Excessive supplies. Work waiting in inbox.

Waiting

Delays from waiting for approvals, bottlenecks, downtime

Mistakes & Defects

Requires rework, disposal, or causes problems downstream

Unused Resources

Not fully utilizing people's talents, energy or time. Limited authority. Not engaged. Not trained. Equipment not used.

Overproduction

Doing more than is required. Printing extra copies. Reports that are not used.



Symptoms of Opportunity to Improve

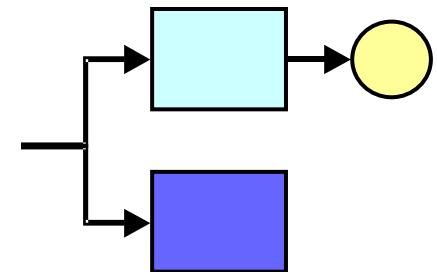
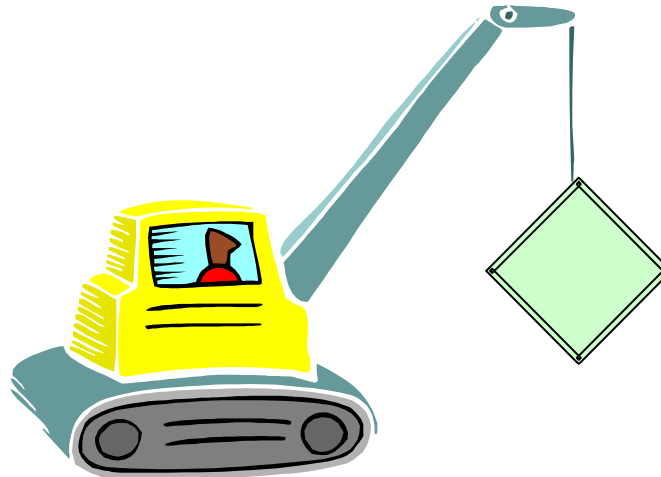
- **External** complaints or feedback about:
 - Service, not getting what they want or need...
 - Errors, mistakes
 - Delays, timeliness
 - Lack of clarity, inconsistency
 - Need to know the right person
- **Internal** complaints, frustration or knowledge about:
 - Feeling overworked with no end in sight
 - Having to do rework due to errors
 - Doing tasks that don't seem necessary
 - Waste, inefficiency, ineffective processes
 - Complex processes, difficult to know status



And many more possible symptoms.

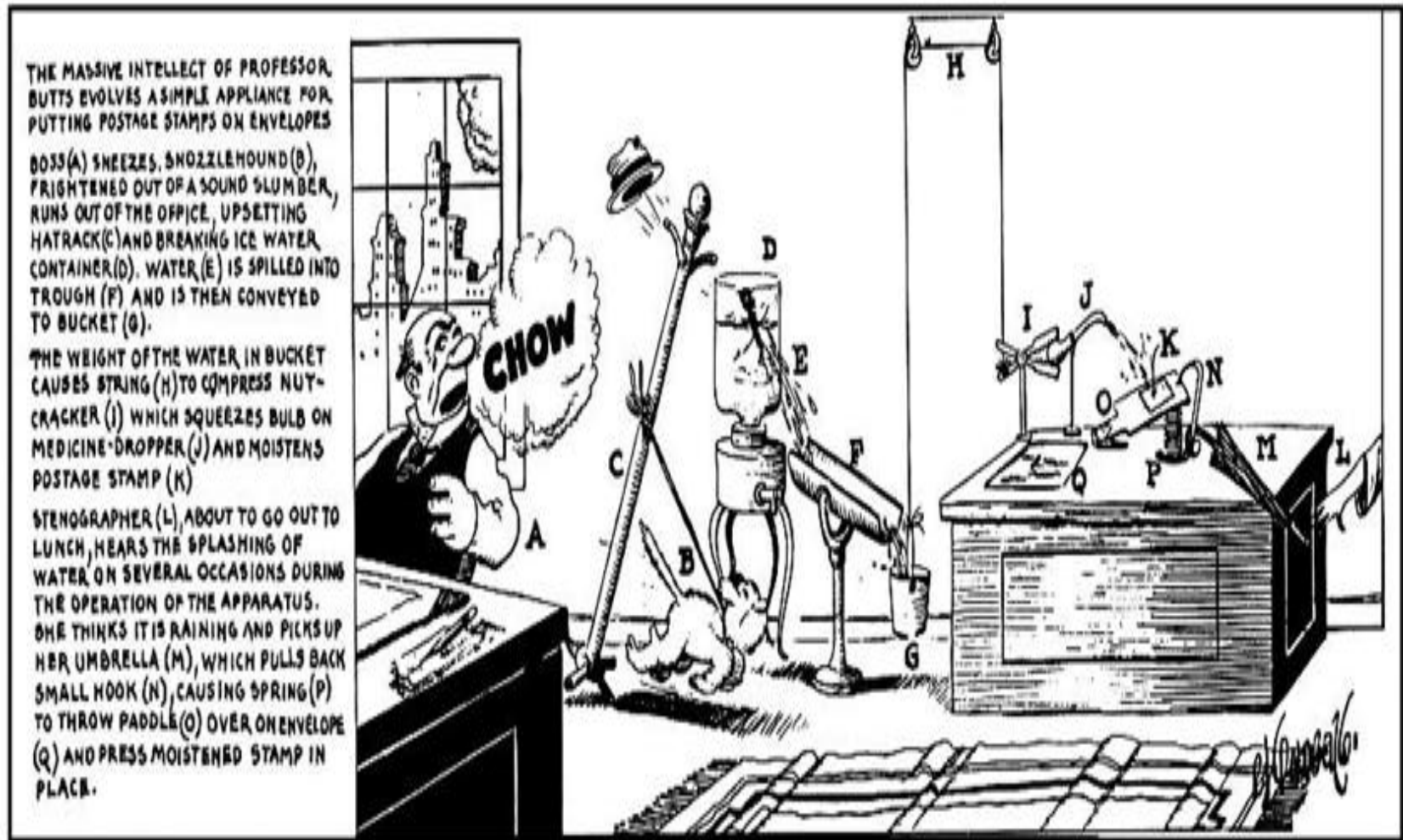
Why Are There Problems?

- 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
 - Removed steps that were helpful or needed
- Process dependent on a few individuals but not documented



Rube Goldberg Processes

Putting Postage on Envelopes



Source: www.rubegoldberg.com

Other Opportunities

- Recognize an opportunity to further improve a good process.
- Proactively finding ways to stay ahead.



You don't need a "broken" process.
Most processes can be improved, even if working OK.

How Do We Improve?



- Reach agreement on an opportunity
 - Sufficient levels of authority to address the issues
- Get the right people together
- Guide them through an effective improvement approach
- Help them use the appropriate tools and techniques
- Ensure they get the support they need
 - Time
 - Resources
 - Skills
- Measure to ensure effective
- Document
- Recognition



Facilitative Leadership

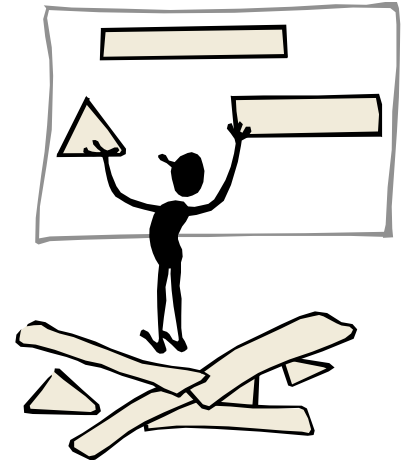
Active, engaged and committed leadership is essential to effect process improvement.

Project Charter

A written document chartering a team to address a problem or opportunity.

Charter

- Describe the problem & define the purpose
- Identify the sponsors, leader, facilitator and team
- Create a high-level map of the process steps
- List improvement targets, metrics and vision of success
- Scope: Define the boundaries, what is in vs. out of scope
- Describe dependencies and risks
- Create a draft project plan with milestones and target dates
- Identify other resources needed including the budget



Identifying Roles & Responsibilities of Team

- Executive Sponsors
- Process Owner
- Project Lead
- Facilitator
- Team composed of people who know the process being improved

Team Members

- Team Membership should include people with other key skills, or who have access to other needed resources such as:
 - IT
 - Data person
 - Maverick

Team Members

- Skilled facilitation is essential for team success.
- An experienced coach or mentor should meet regularly with new facilitators.

Approach

The steps you will take, in a logical order, to have efficient and effective improvement and problem solving.

Types of Quality Approaches

- **Develop a New Process, Product or Service**
 - Quality Planning, DFSS, DMADV....
- **Improve an Existing Process, Product or Service**
 - Quality Improvement, Problem Solving, DMAIC, PDCA, FOCUS-PDCA, AIM-PDCA, Lean, 5S....
- **Control a Process to Maintain Performance**
 - Quality Control, Visual Controls, Feedback loops, Measurement
- **Other**
 - Benchmarking, Reengineering....

Example Approach: FOCUS-PDCA

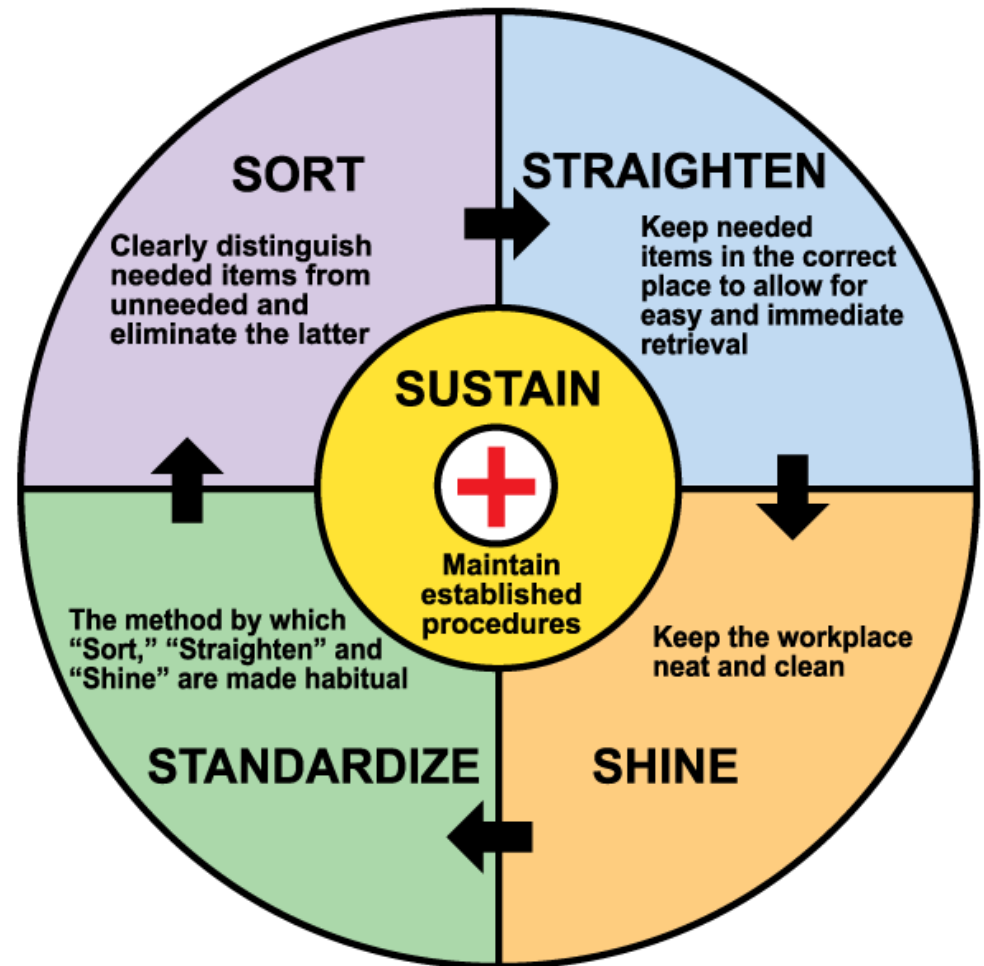
Main Step	Typical Substeps	Tools
F <i>Find a process to improve</i>	<ul style="list-style-type: none"> •Prioritize •Customer research •Review strategic / operational plans •Identify Indicators, KQC's 	<ul style="list-style-type: none"> •Brainstorming •Customer interviews •Pareto analysis •Prioritization matrix •Control chart
O <i>Organize to improve</i>	<ul style="list-style-type: none"> •Select people who have process knowledge •Create a project plan 	<ul style="list-style-type: none"> •Ground rules , norms •Planning tools - spreadsheet, timeline, tree diagram
C <i>Clarify current knowledge of the process</i>	<ul style="list-style-type: none"> •Examine current process •Identify quick & easy fixes •Standardize on the best current method 	<ul style="list-style-type: none"> •Flowchart, interviews, focus groups, process map •Group decision making tools
U <i>Understand sources of variation</i>	<ul style="list-style-type: none"> •Measure the Key Quality Characteristic •Stabilize the process eliminate special causes •Identify Process Variables •Measure Key Process Variables •Test for relationship between KPV and KQC 	<ul style="list-style-type: none"> •Cause & Effect diagram •Data collection methods •Flow chart •Pareto analysis •Run/control chart •Scatter diagram •Histogram •Group decision making tools
S <i>Select the process improvement</i>	<ul style="list-style-type: none"> •Evaluate the alternatives for potential effect & feasibility •Select one 	<ul style="list-style-type: none"> •Flow chart •Evaluation matrix •Group decision making tools
P <i>Plan the improvement</i>	<ul style="list-style-type: none"> •Plan implementation of specific improvement •Plan data collection for ongoing monitoring 	<ul style="list-style-type: none"> •Data collection tools •Group decision making tools •Procedure/policy documentation
D <i>Do the improvement to the process</i>	<ul style="list-style-type: none"> •Make the changes •Measure their impact 	<ul style="list-style-type: none"> •Flow chart •Data collection methods •Run or control chart
C <i>Check the results</i>	<ul style="list-style-type: none"> •Examine data to determine if the change led to the expected improvement •Study the results 	<ul style="list-style-type: none"> •Pareto analysis •Cause & effect diagram •Run or control chart •Histogram
A <i>Act on the results - hold gains or try next improvement</i>	<ul style="list-style-type: none"> •Adjust implementation based on the results •Develop a strategy to maintain the improvements •Determine whether or not to continue working on the process or move on to another project 	<ul style="list-style-type: none"> •Flow chart •Group decision making tools

Example Approach: DMAIC

- Define
 - Understand problem & objective; Voice of customer
- Measure
 - Create measures and collect data
- Analyze
 - Understand the root cause
- Improve
 - Make the needed changes
- Control
 - Maintain via work design & feedback

Example Approach: 5S

1. Sort
2. Set in Order
3. Shine
4. Standardize
5. Sustain



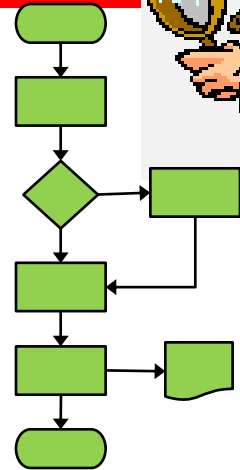
Example Approach: Benchmarking

Benchmark: The “best” performance level anywhere.

Benchmarking: Finding out “how” they achieve that level of performance.

Typical BPI Approach

- Clarify problem & opportunity
- Understand customer needs
- Map existing process
- Review the process and ID changes
 - Streamline, simplify, eliminate steps, reorder, mistake-proof
- Implement, train, make changes
- Measure the results



Solutions

- Make it easier, more efficient & accurate to....
- Improve the process by...
 - Clarify handoffs: what's needed by whom, when, why.
 - Clarify steps that are not understood
 - Remove steps that are not needed or add needed steps
 - Reorder steps to be more logical
 - Mistake-proof
 - Minimize motion and distance traveled
 - Minimize time to perform a task
 - Ensure appropriate resources are used/available
 - Ensure appropriate amounts are produced/worked

Types of Solutions

- Manual
 - Focus on clarify, simplify, re-order/add steps
 - Advantages: Easier, less costly, quicker initial improvement.
 - Disadvantages: Tend to be more limited in scope, less thorough; can slip back to old ways; more difficult to measure; more difficult to maintain gains
- Business Process Management Software
 - Same focus to clarify, simplify, reorder/add steps
 - Not applicable for all types of problems.
 - Advantages: Framework ensures more thorough process definition; more effective measures; more likely to hold gains and obtain lasting benefits; higher return
 - Disadvantages: Higher skill level required; higher initial cost and time investment.

Handysoft BizFlow BPM Software Components

- Provide tracking and auditing to monitor work-in progress, audit all activity
(Just like tracking a Fed-ex Package – Track Forms/Documents)

The screenshot shows a web browser window displaying a FedEx tracking page. The URL is http://www.fedex.com/Tracking?tracknumbers=793288567438&cntry_code=us&language=english&ident.... The page title is "Detailed Results" and "Notifications". The tracking number is 793288567438. The status is "Delivered". The package was signed for by S. HENKLE. The shipment dates are: Ship date: Feb 22, 2010; Delivery date: Feb 23, 2010 9:39 AM. The destination is SAN DIEGO, CA. The shipment facts are: Service type: Standard Envelope; Weight: 0.5 lbs/2 kg; Delivered to: Receptionist/Front Desk. The shipment travel history shows the package's path from West Springfield, VA to San Diego, CA.

Date/Time	Activity	Location	Details
Feb 23, 2010 9:39 AM	Delivered	SAN DIEGO, CA	
Feb 23, 2010 8:41 AM	On FedEx vehicle for delivery	SAN DIEGO, CA	
Feb 23, 2010 7:13 AM	At local FedEx facility	SAN DIEGO, CA	
Feb 23, 2010 5:59 AM	At dest sort facility	SAN DIEGO, CA	
Feb 23, 2010 4:19 AM	Departed FedEx location	MEMPHIS, TN	
Feb 23, 2010 12:09 AM	Arrived at FedEx location	MEMPHIS, TN	
Feb 22, 2010 9:15 PM	Left FedEx origin facility	WEST SPRINGFIELD, VA	

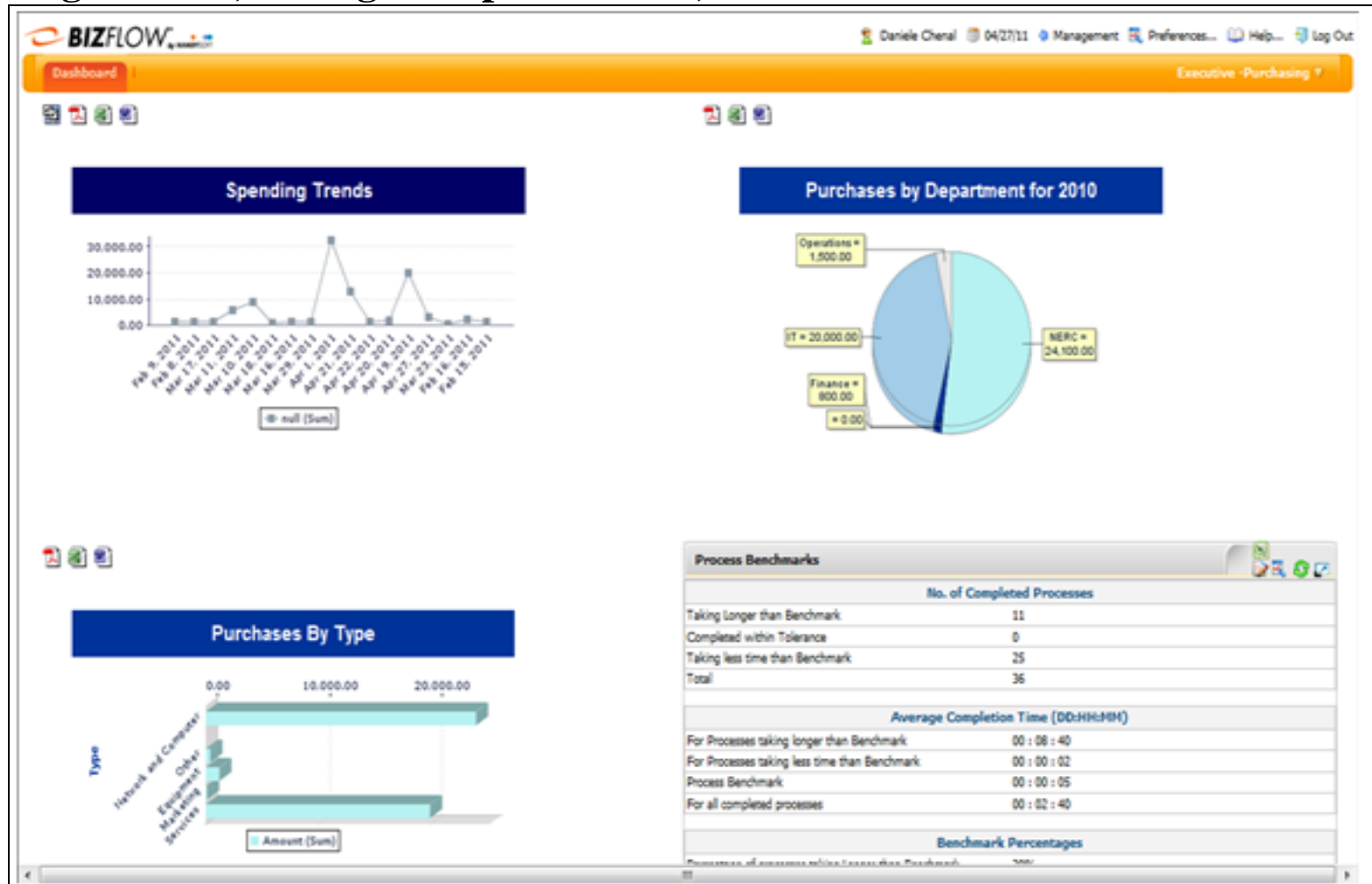
The screenshot shows the BizFlow Process Monitor interface. The top section displays a flowchart for the "Procurement Process". The process starts with "Start Procurement Request", followed by "Authorizing Official and Commitment of Funds", "Reviewer 1", "Reviewer 2", "Service Level Measurement", "Procurement Process", and "Financial System Web Service (SOA)". The process ends with "End". The flowchart also includes "Requestor", "Assign Prog Officer", "Reviewer", and "Procurement System Integration".

Worklist	Trail	Activity	Attachment	Comment	EDMS Application	EDMS Attachment	Custom Attribute
102	Completed	Start Procurement Request				Michael Chen	Michael Chen 10/11/07 13:07:09
104	Designated	Authorizing Official and Commitment of Funds				Brian Miller	10/11/07 13:11:57
108	Overdue Running	Authorizing Official and Commitment of Funds				Dan Carr	10/11/07 13:11:57

BizFlow Process Monitor

Handysoft BizFlow BPM Software Components

- **Metrics to measure performance and continuously improve**
E.g. volume, average completion time, workload



Handysoft Quantitative & Qualitative Results

Improved Business Performance

- **Visibility and accountability with measurable performance**
- **Process more with less**
 - 17% increase in output
- **Deliver better services**
 - 43% increase cycle times
- **Impact top and bottom lines**
 - 18% y/y operating cost reductions
- **Reduce compliance risks through enforcement of policy**

Department of Energy
reduced loan review
time by 65%

**2010 GOLD AWARD
For Process Excellence
WfMC**



United Technologies-
Internal Control
information gathering
activities that took weeks
now takes hours.



United Technologies

Cambrian - Increased
loan processing by
600%, allowing them
to offer Mortgage
rates of 1% less than
competitors.



Nuclear Regulatory
Commission
reduced headcount
and achieved \$1.5
million ROI, < 1 year
to deploy



*Used with permission from
Handysoft Corporation*

Gartner. BPM Excellence Award Winner

Tools & Techniques



- Basic Tools of Quality
 - Cause-and-effect diagrams, Check sheet, Run and Control charts, Histogram, Pareto chart, Scatter diagram, Flowchart....
- Group Management
 - Creativity & idea generating, conflict resolution, decision making methods, structured meeting processes....
- Management and Planning
 - PERT, CPM, Affinity diagrams, Tree diagrams....
- And many more...
 - Simulations and modeling, queuing, linear programming....

Skill with Tools

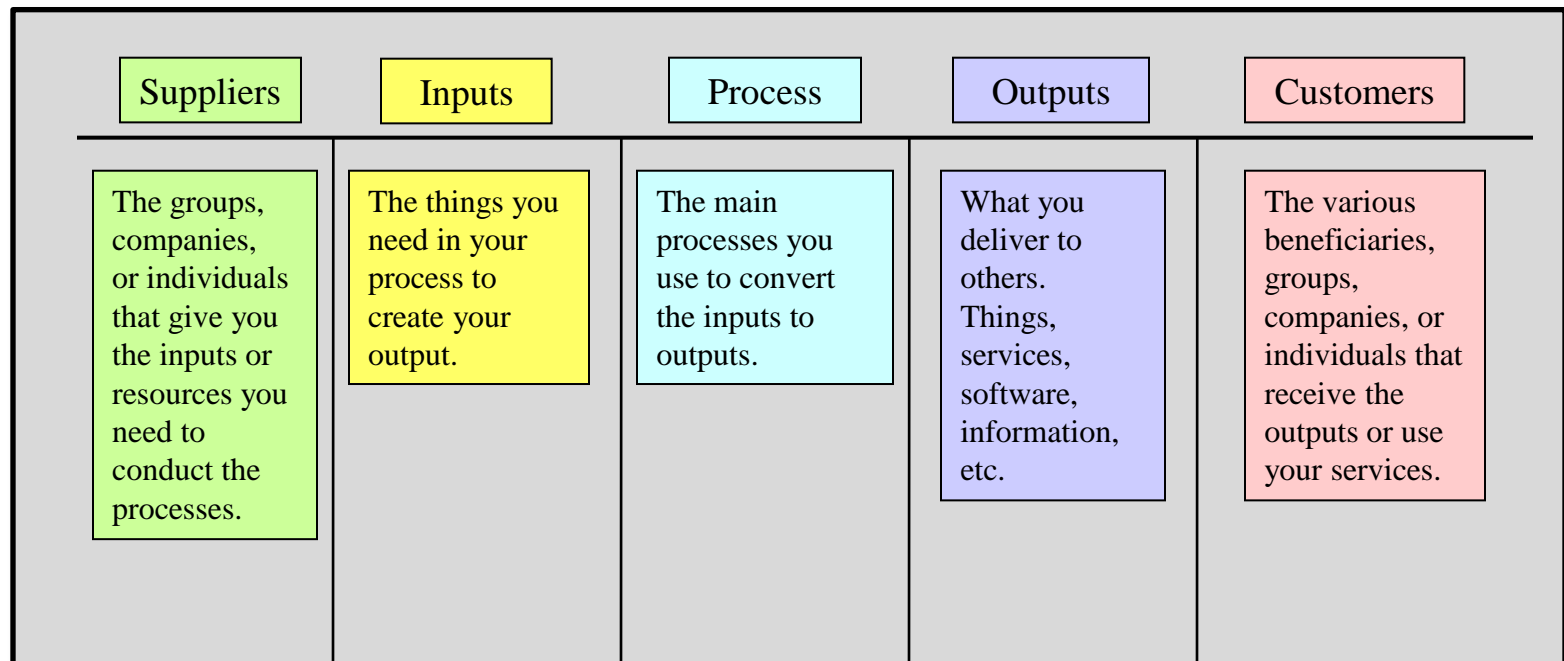
The tools of quality and performance improvement, like any other tool, can be misused.

Education, training, mentoring and coaching are essential.

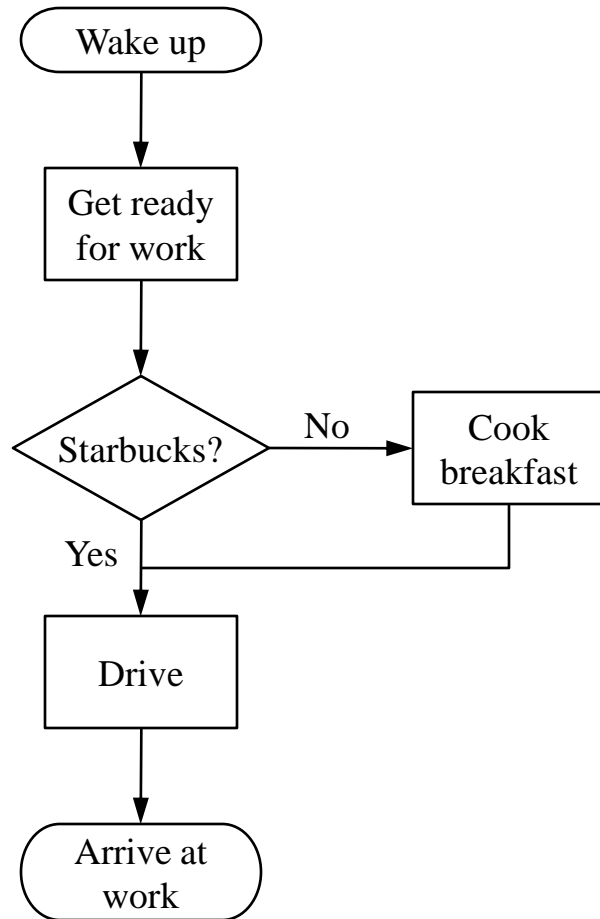


SIPOC

- High-level, macro view of the organization.
 - Department, function, area, company, campus, etc.
- **S**upplier, **I**nput, **P**rocess, **O**utput, **C**ustomer
- Different formats exist.
 - Can add requirements
 - Some include high level flow diagrams of main processes



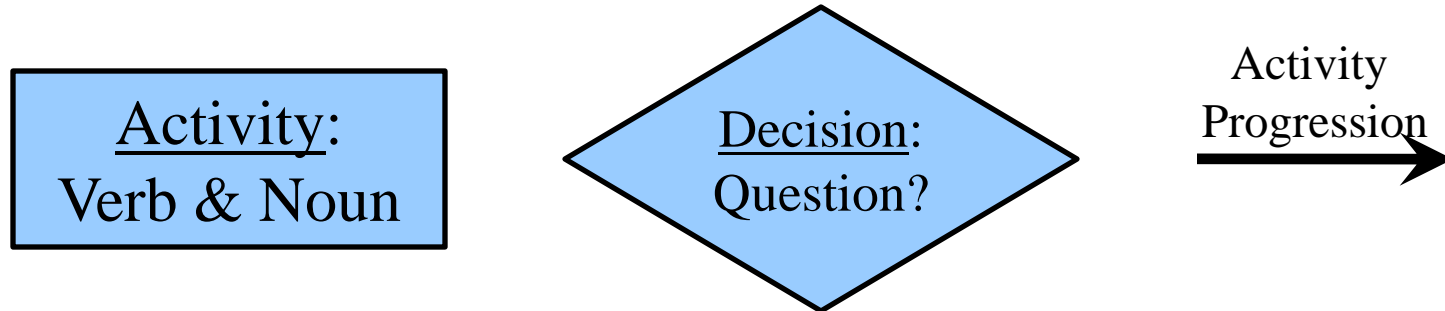
Basic Flowchart



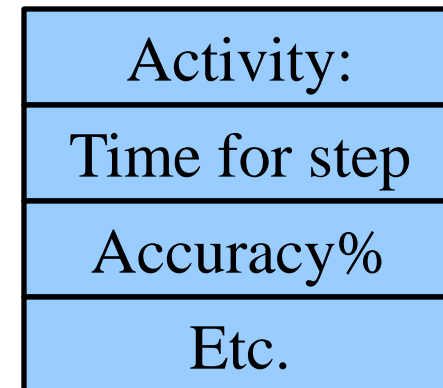
- Walk through process
- Start with high-level chart, 4 to 12 steps
- List the main steps on cards or sticky notes.
- Arrange them in order
- Take a specific instance.
- Can do multiple versions or categorize into “all do” versus “some do”

Symbols & Other Information

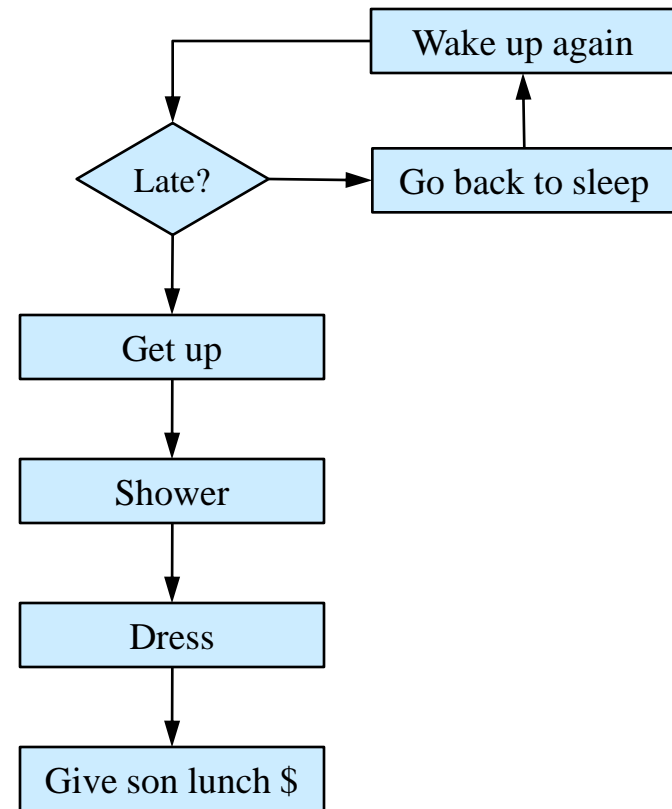
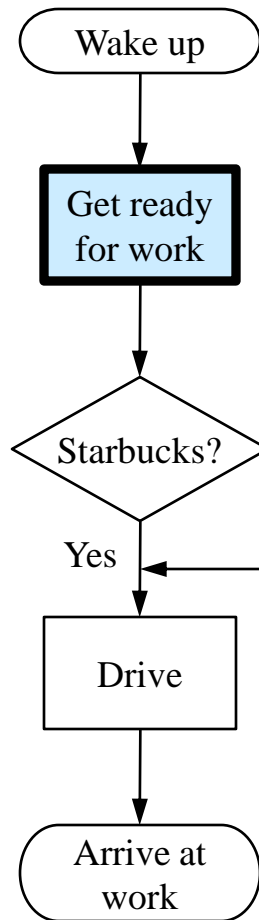
- There are many symbols used in flow charting
- Most important: Activity, Decision, Flow Direction



- Benefit often gained from adding other process details
 - Elapsed times, wait times, applied times
 - Distance
 - Number of workers involved
 - Error rates or % accurate

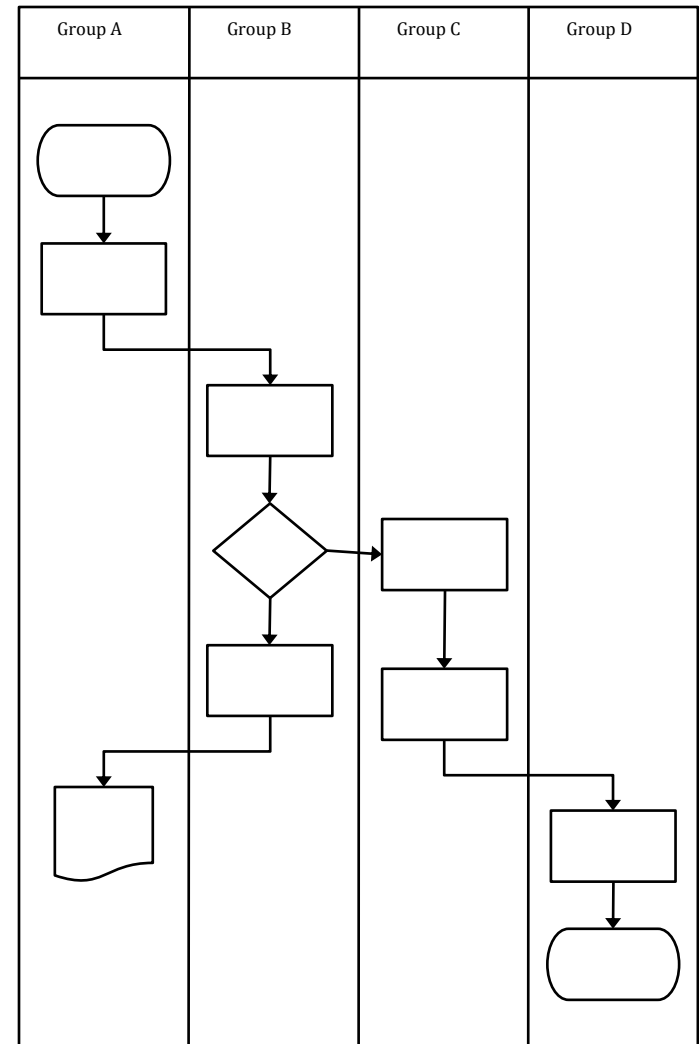


Basic Flowchart → Detailed Flowchart



Matrix or Deployment Flowchart

- More complex processes where multiple people, departments, or organizations are involved.
- Helps clarify roles in addition to the flow of events.



Project Reports

- An “organizational memory”
- Different formats available
- Different lengths helpful
 - *Detailed notebook*
 - *1 to 2 page summary*
 - *Storyboard*

Reports

- 1 or 2 page summaries helpful for broad communication, executive summaries, web sites.
- Formats like “A3” can be used as a way to move a group through a project (an approach) and as a summary.

FRESNO STATE
California State University, Fresno

Final Report: 07/05/11
Performance Improvement
Administrative Services

Team: Employee Transaction Form

Problem Statement
The Employee Transaction Form (ETF) and process were confusing and difficult to use. There were issues with delays in processing the forms and with errors and incomplete documents.

Mission Statement
Create an efficient, accurate and timely process for ETFs.

Team Members
Tracey Gerbe (HR) - Facilitator
Robert Quinn (Technology Services) - Facilitator
Linda Biese (HR)
Mike Cunniff (HR)
Cindy Eastin (Payroll)
Diane Volpe (Academic Personnel)

Findings

Baseline data

- 15 days average time to process.
- 85% of forms processed after effective date.
- 118 fields on form, 75% not used.
- Confusing form resulted in frequent incorrect information being supplied.
- Approval authority not clearly defined.
- Typical request required 5 signatures.
- Redundant information and processing steps (Back and forth between paper and PeopleSoft).

Initial Process (Yellow boxes have 3 sub-steps)

Key Project Steps

1. First team meeting (06/04/09)
2. Documented initial process (04/10/09)

Solutions

- Redesigned and automated the process, incorporated within PeopleSoft
- 22-step manual form → 5-step on-line form
- Eliminated unused fields
- New defined approval process-Delegation of Authority Tables

New Process

Results

Eliminated need for multiple copies.
Able to track where ETF is in approval process.
5 days average time to process.
(Comparing same transactions before vs after we showed a decrease from 20 to 5 days. N=before = 45, N=after = 148)

Results from On-line ETF System

Managing to Learn — A3 Example #1: Acme Stamping

Acme Stamping Steering Bracket Value Stream Map

Background

- Product Family: Stamped-Steel Brackets for Steering Wheels (L & R-hand drive).
- 18,400 brackets/month supplied to State Street Assembly in daily shipments on pallets of 10 trays of 20 brackets.
- Customer is considering adding a 3rd shift... Will only be able provide a firm schedule on a rolling two-week basis.

Current Situation

- Current production lead time for State Street orders: 23.6 days
- Current processing time: only 198 seconds
- Now operating in two shifts, 20 days per month with average 1.1 hours OT/day
- Large inventories of material and Work-in-Progress between processes.
- Long changeover times; downtime in Welding.

Current State Map

Analysis

- (1) Each process operates as an isolated island, disconnected from customer.
- (2) Push system; (3) Inventory builds up between processes.
- (4) Each process builds according to its own operating constraints (changeover, downtime, etc.)
- (5) Plans based on 90 and 30-day forecasts from customer. (6) Weekly schedule for each department. (7) System is frequently overridden to make delivery.

Goals: Improve profitability while meeting tougher customer demands:

- Reduce lead time — 23.6 days to 5.5 days
- Reduce inventories: Stamping — < 22 days
- Welding — Eliminate
- Shipping — < 2 days
- Eliminate Overtime on all shifts

13000 Shock/Vibrble

Countermeasures:

- Create continuous flow in through Weld and Assembly as a Cell > (1)
- Establish "Takt" Time: Base the pace of work through Weld and Assembly on customer demand at Ship > (5)
- Set new Weld-Assembly cell as pacemaker for entire value stream > (1)
- Establish Business Schedule for Stamp based on actual use of Pacemaker Cell and pull steel coils from supplier based on actual Stamp usage > (3)
- Reduce Changeover time in Stamp & Weld. Improve uptime in Weld & (4)
- Establish Kanban system. Supermarkets & material handling routes for frequent withdrawal and delivery > (2)
- Establish new production instruction system with Leveling Box > (6 & 7)

BENEFITS: Lead Time & Inventory reduction to 4.5 days allowing feasible to meet 3 shift demand of customer without overtime or adding 3rd shift

COSTS: \$300K (estimated) will be recovered in 14 months from save revenue

Future State Map

Lead Time 4.5 days

DEPARTMENT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		
CO at Pacemaker																																
Kanban/Inventory																																
Weld																																
Assembly																																
Ship																																
Customer																																

Follow-up

- Establish monthly review cycle with management of related departments: PC, MH, Plant Maint, HR, etc.
- Create Tracking Center between Stamping & Weld/Assembly Cell
- Track reduction of lead-time, inventory, overtime as well as plan status

Recognition

Don't forget to provide appropriate
reward and recognition for
individual and group contributions!

Key Success Factors

- Leadership commitment & interest
- People who know the process
- People who understand improvement & systems
- Opportunity to work as a team
- Making it a project, an event
- Appropriate tools
- Time and resources
- Support to overcome difficulties
- Measures of progress – qualitative & quantitative
- Documentation
- Reward & Recognition

Interested in Learning More?

- A course is being developed
- If you would like to learn more, send an email providing your contact information to:

Alexis Naiknimbalkar, Project Manager

Anaik@calstate.edu

Subject Line:

Interest in Process Improvement Course

Text: Please add my name to your mailing list regarding potential training in process improvement.

What Opportunities Do You Have?

- List at up to three situations with opportunities to improve
- Describe the types of problems that occur or opportunities you see for each
- Use concepts about problems or waste from the previous pages.

Process Name: _____

Problems/Issues

Process Name: _____

Problems/Issues

Process Name: _____

Problems/Issues

Your Opportunity

Select one opportunity and begin to assemble information for a project charter

- Project title
- Executive sponsor, process owner, leader, facilitator, team
- Purpose of the process
- Problem/issue description - customer & worker standpoint.
- High level process map (4 to 12 steps/blocks maximum)
- Scope: Start and end points/actions, location, customers
- Improvement targets sponsor & owner expect to achieve
- Metrics: Baseline (if known) & goals
- Vision for the future process. When working well it will....
- Resources anticipated: People, time, equipment, funds

Aim High!

You won't know what you can
accomplish until you try!