

Kaizen: PAC Nutcracker Process

Participant Name: _____

Kaizen

Participant Workbook

Dates: 10, 15, and 22 July 2014

Facilitator: Eric Olsen
Cal Poly State University

Kaizen: PAC Nutcracker Process

Invitation

Dear PAC team,

We would like you to participate in a “kaizen” activity described below that will lead us to **be more effective and improve our acceptance and recording process for our performances**. Our experience has been that **the people closest to the work are the best ones to solve process-related problems**. You would be about the 17th group on campus to take on this challenge and we are confident that you will be successful. One of the goals is to develop expertise among the participants so you may then serve as facilitators for other process improvement activities in your own areas and elsewhere on campus. Indeed, we are inviting participants who have been in previous kaizen events and potentially a few folks from outside Cal Poly.

In consultation with Eric Olsen, we have **selected NUTCRACKER as a representative process to improve**. This area was selected because this is a **recurring event; is well known throughout the department; and is touched by everyone**. The workflow lends itself well to process improvement analysis; it is cross-functional; and the potential benefits of any process improvement are important for Cal Poly. Professor Eric Olsen cob.calpoly.edu/faculty/eric-olsen/ will be our facilitator. Eric developed considerable expertise in process improvement at, and before coming to, Cal Poly.

We plan to use a “kaizen event” approach and you will be a critical participant in the process. Kaizen is a Japanese term for continuous improvement. By **bringing together process experts in a focused effort to analyze the process, identify problems, and brainstorm solutions, many organizations are making dramatic improvements in value delivery**. In industry, kaizen events often involve 2-3 days of dedicated effort; however, we have adapted the methodology to encompass three half-day sessions. Your presence is required for all three sessions. A number of other central administrators will be invited to attend the opening session so they can better appreciate and support the kaizen process. The final session will include a presentation to us of your findings and recommendations for improvement.

Stephanie Roberson
Associate Managing Director Technical Services
Performing Arts Center San Luis Obispo
www.pacslo.org

Central Coast Lean Kaizen History

18 – PAC Nutcracker Process - 2014

- 17 Hancock Hiring Process - 2014**
- 16 Cal Poly Special Events Review - 2014**
- 15 Employee Intake Process - 2013**
- 14 Helical Sale to Order Process - 2013**
- 13 SLO County GSA Customer Service Process - 2013**
- 12 SLO County Facility Services Maintenance Work Order Process - 2012**
- 11 SLO County Parks & Recreation Reservation Process - 2011**
- 10 2nd Floor Admin Layout - 2011**
- 9 Lecturer and TA Appointment Process - 2011**
- 8 Course Approval Process - 2011**
- 7 HR Staffing Process - 2011**
- 6 Volar Pack and Ship Process - 2010**
- 5 Commencement Budgeting Process -2010**
- 4 Course Substitution Process - 2010**
- 3 Academic Program Review Process - 2010**
- 2 Cash Gift Process - 2009**
- 1 Grant Contracting Process - 2009**

Welcome!

Kaizen Event Outline

Session 1

- a. Values and objectives
 - b. Training on concepts and tools**
 - c. Practice
 - d. Select target process for improvement**
 - e. Select preliminary metrics
- Homework: Observe and think about the process – *Get ready!*

Session 2

- a. Confirm process selection
 - b. Analyze and map the process**
 - c. Classify value and non-value
 - d. Report out
- Homework: Verify the map

Session 3

- a. Review data
- b. Identify problems**
- c. Classify and prioritize problems
- d. Brainstorm solutions**
- e. Identify and implement – Just-Do-Its
- f. **Create action plan:** What, Who, When and Target Metrics
- g. Present results and plan to management**
- h. Celebrate!

Follow-up Meeting: Confirm action plan, measures, roles, and responsibilities.

Implementation Follow-up:

Results presentation to management (3-6 months)!

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Ground Rules:

1. Participants should know the outcome expected of each session and the process to achieve that outcome.
2. Attack issues, not people.
3. At anytime, anyone can ask for a sense of the group to conclude or modify the process.
4. Participants can give a brief signal to the facilitator to speak in turn.
5. Everyone has the right to finish speaking.
6. Everyone has an obligation to be concise.
7. One discussion at a time (avoid whispered discussions).
8. Do not bring unrelated work to the meeting.

The gift of FOCUS!

9. Everyone is a Kaizen Team member (***No Observers!***) – All are responsible for the success of the event.

Adapted from Hewlett-Packard, "Project Mgt – Action Sheet" (1998)

SESSION 1

KEY CONCEPTS & PROJECT SELECTION

Values and objectives

1. **Customers determine value.**
2. **We use processes to deliver value.**

Overall Generic Goals for Kaizen Event:

- Improve the value we deliver.
- Improve how we deliver value (processes).
- Demonstrate the use of kaizen events to improve.
- Establish a culture of continuous improvement.
- Develop improvement capability in people.
- Make getting better fun!

What is **kaizen**? → Simply the Japanese word for **continuous improvement**.

Ten Commandments of Continuous Improvement

Per Gemba Academy, 2010

1. Open your mind to change.
- 2. Think “Yes we can, if...”**
3. Always attack processes, never people.
- 4. Seek simple solutions.**
5. If it's broken, stop to fix it.
- 6. Use creativity, not capital.**
7. Problems are opportunities in disguise.
- 8. Find the root cause.**
9. Wisdom of many, not the knowledge of one.
- 10. *There is no final destination on the improvement journey !***

<http://youtu.be/Q89qAbAAR3Q>

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Introduction Exercise: Kaizen Goal Poster

In teams of 3-4 **people you do not know well**, create a poster that answers:

- Who are you?
- What is your role?
- What would a **really good outcome** to this event?
- What is your **“Whack on the Side of the Head?”**

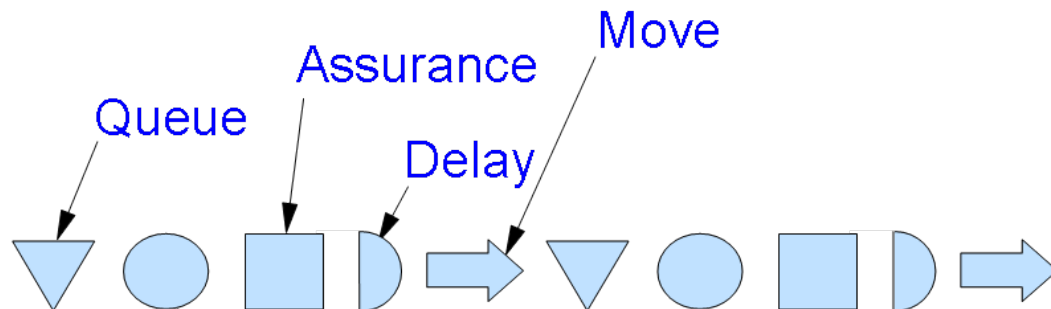
Name?	Role?
Good outcome:	
Whack:	

Training on concepts and tools

Value: **Cost, Quality and TIME [the “Super Metric”]**

Flow Charting – For Value

The Any Process Lead Time Model



Value Test: Run - Only "value added" step!

1. Has something been **added** that has value in the eyes of the **final customer**?
2. If our process was **perfect**....would we still do it ?

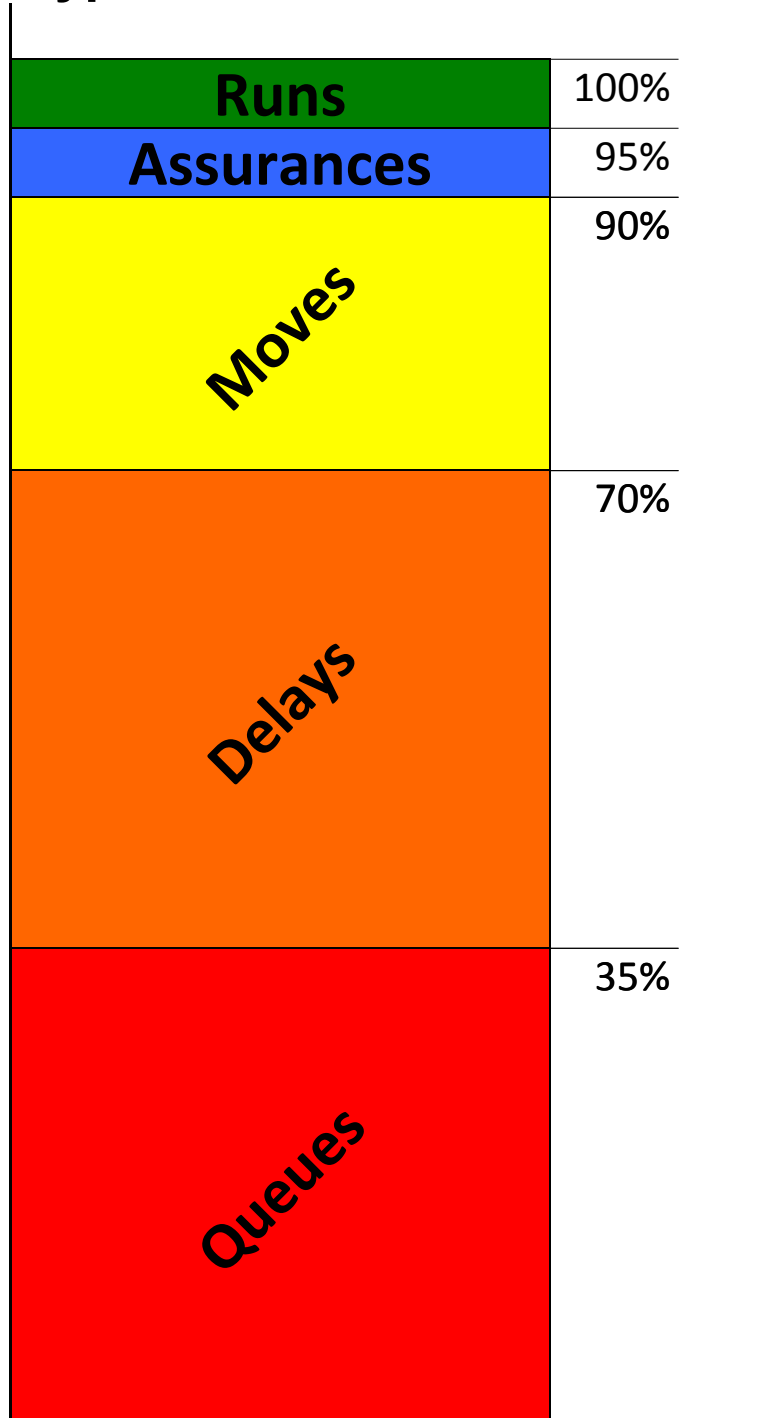
[Remember: “Have to” ≠ Value.]

Eric Olsen – Cal Poly Industrial Technology

2

Customers vs Partners?

Value (continued)

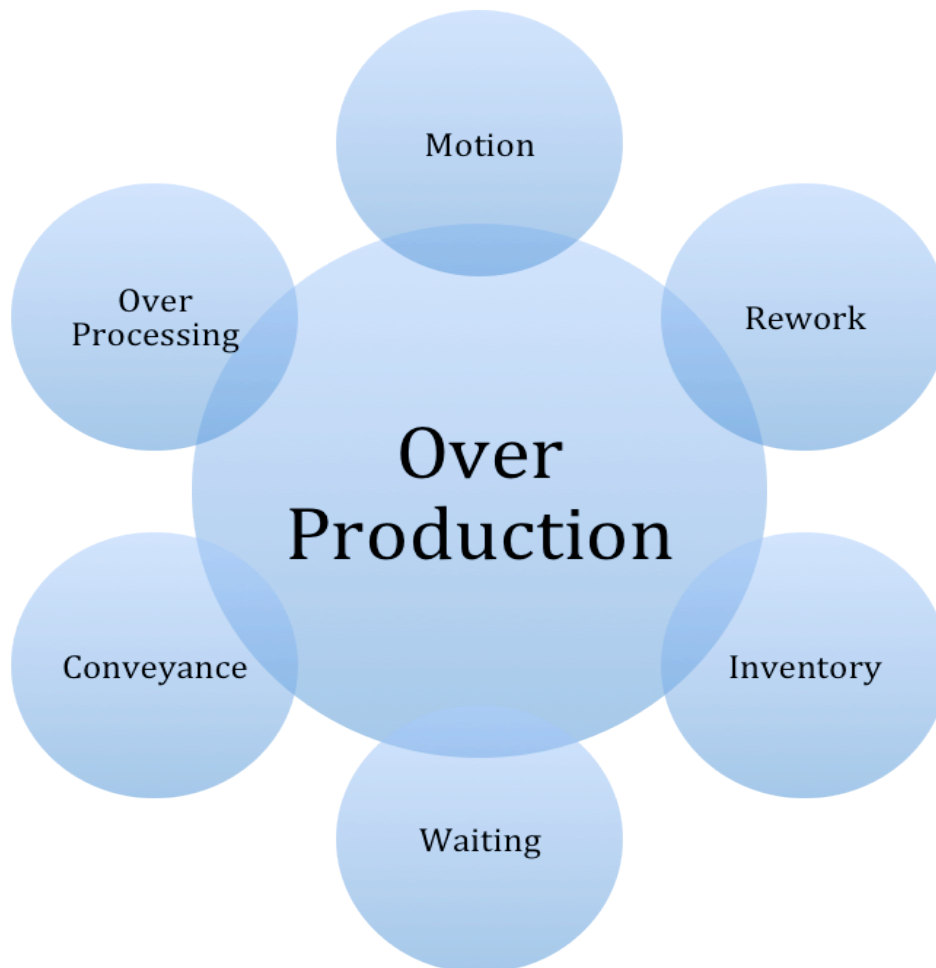
Typical Lead Time Breakdown

Video - Muda Eggs

What are the seven forms of muda?



The 7 Wastes



Eight Service Industry Wastes

Does our target process have any of the following?

- 1. Errors in documents?**
- 2. Transport of documents?**
- 3. Doing unnecessary work not requested?**
- 4. Waiting for the next process step?**
- 5. Process of getting approvals?**
- 6. Unnecessary motions?**
- 7. Backlog in work queues?**
- 8. Underutilized employees?**

- Lean Office Series: Lean office Value Streams – (Factory Strategies Group LLC, 2009)

9. Not being able to tell what is going on!

Examples of Office Process Waste

Does our target process have any of the following?

- A. Too many signature levels**
- B. Unclear job descriptions**
- C. Obsolete databases/files/folders**
- D. Purchase orders not matching quotation**
- E. Errors – typo's, misspelling, wrong data**
- F. Waiting – for information, at meetings, etc.**
- G. Poor office layout**
- H. Unnecessary E-mails**

- *Lean Office Series: Lean office Value Streams – (Factory Strategies Group LLC, 2009)*

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Practice

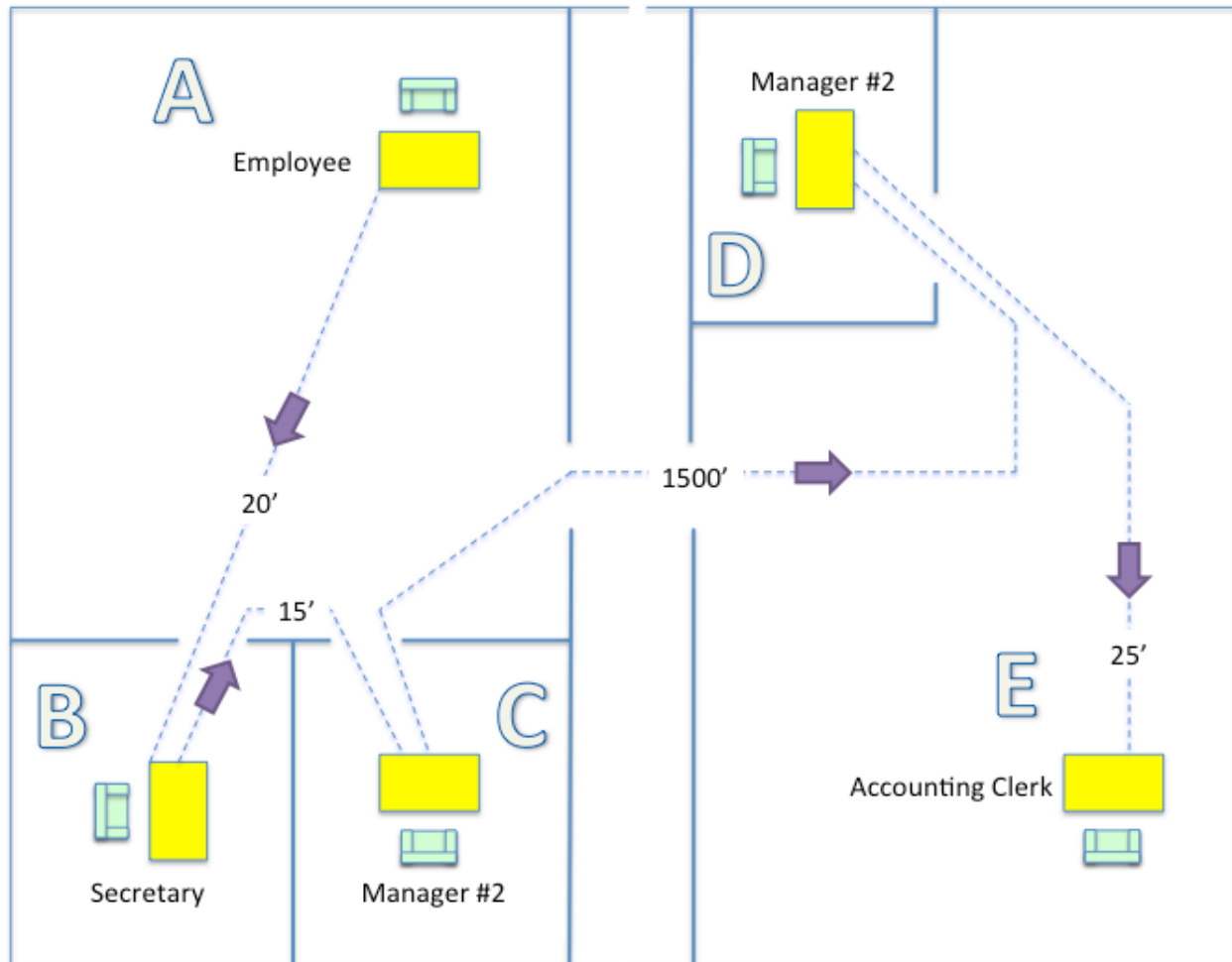
The steps for an expense report approval process are provided below. Classify each step as to whether it is a queue, run, assurance, delay, or move [Adapted from Mfg341 "Improve the Production System," Motorola University, 1994].

#	Process Step	CT Element(s)	Distance	Quantity	Time (hrs)
1	Expense account form written by employee				1.5
2	Out basket awaiting interoffice mail pickup				9.0
3	To department manager's secretary		20'		.5
4	Waiting on secretary's desk				8
5	Typed by secretary from handwritten copy				.75
6	To department manager's desk		15'		.50
7	In basket awaiting approval signature				10.0
8	Examined by department manager				.50
9	Signed by department manager				.16
10	Out basket awaiting interoffice mail pickup				11.5

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#	Process Step	CT Element(s)	Distance	Quantity	Time (hrs)
11	To accounting department		1500'		1.0
12	Waiting on manager's desk				12.25
13	Examined by manager				.5
14	Approved by manager				.25
15	To accounting clerk's desk		25'		2.0
16	On desk waiting for preparation of check				16.0
17	Write check				.25

Facility Layout – “Spaghetti Diagram”



Ball Exercise:

How do we reduce process lead-time while still delivering value?

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A3 Problem Solving

TITLE

I. BACKGROUND – *Why are we talking about it?*

II. CURRENT SITUATION – *Where do things stand today?*

III. GOALS/TARGETS – *What specific outcomes are required?*

IV. PROBLEM STATEMENT – *What is the gap?*

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V. ANALYSIS – *What is the root cause of the problem?*

VI. PROPOSED COUNTERMEASURES – *What is your proposal to reach the future state, target condition?*

VII. PLAN – *What activities will be required for implementation? What, who, and by when?*

VIII. FOLLOW UP – *What other issues can be anticipated? How can we ensure ongoing improvement and capture and share learning?*

Select process for improvement

12 Project Selection Checkpoints

1. Relates to **key business issue**(s)
2. **Impacts customers**
3. **High visibility**
4. **Leadership is receptive** - managerial consensus on importance
5. **Crosses** functional and department **boundaries**
6. **Cooperation** between **stakeholders is likely**
7. Can serve as an **example for other services** or **processes**
8. Is a definable process - has **multiple steps and clear start and stop** points
9. Is **repetitive**
10. Process **not currently being changed**
11. Process **not a part of another process improvement** project
12. **Not an already developed solution to be tested**

Adapted from: "Lean Thinking – Leadership Preparation," University of Toyota, 2003.

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Draft Project Charter

<u>Process</u>	
<u>Customer(s)</u>	<u>Partners</u>
<u>"Default" product or transaction</u>	
<u>Start point</u>	<u>Stop point</u>
<u>Measures</u>	

Critical Question:

***Do we have the
right people on the
bus?***



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Measurement: “Food for Thought”

Kaizen Teams,

In the event that we do not get to a critical discussion of metrics before wrapping up our first session, I am providing you with some “food for thought” before we next meet. A best practice in executing improvement projects is to develop a measurement system that captures customer value and is simple.

Customer value is usually thought of as a combination of **quality, cost, and time**. If we can develop a few simple measures to capture those three concepts, we will be well on our way.

A good starting point would be the “Four Lean Measurables” described below. We can start with them and adapt them for our process:

1. **First time thru (FTT)** – This quality measure counts the percentage of transactions that make it all the way through the process without errors, scrap, or rework. I think a FTT of 99% is a reasonable expectation for a process, but not as it currently exists. We may want to develop a way to track errors and rework so problems become visible. Another similar measure used for transaction-based processes is “% complete and error free.”
2. **Dock to dock cycle time (DTD)** – This measures the time from the start of the process until its completion. We discussed the power of cycle time as a “super metric”.
3. **Build to schedule (BTS)** – This measures a process’s ability to meet its committed completion time. We can talk about having a one number commitment on turnaround or customized commitments per category. A higher standard that world-class organizations measure is completion to customer required date.
4. **Total cost (TC)** – This measures the direct costs associated with a process and avoids complex allocations and accounting formulas. I would suggest that we simply count heads or the number of times we touch the transaction as a surrogate for TC.

As we map the process, other easy ways to evaluate our process will become obvious. The Four Lean Measurables offered above are just a way to get you thinking about how we will measure improvement in the process.

What gets measured gets done!

Cheers, Eric O.

Session 1 Homework

1. Observe and think about the process
2. Grab any off-the-shelf data to aid in problem analysis
3. Invite missing stakeholders as needed
4. ???

SESSION 2

MAP THE PROCESS

Goal for the Day:

Capture the TRUTH!

Review

Key concepts

- Value is in the eyes of the final customer
- Processes deliver value
- Lead time elements

Confirm project selection

Define VALUE

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Map the Process

Common Process Map Options *[adapted from: Moresteam.com]*

Map Type	Distinguishing Features	Comments
SIPOC Map	Identifies Suppliers, Inputs, Outputs, and Customers	High level starting point - used in most DMAIC projects
Flow Chart	Shows decision points and If/Then logic	Displays procedures and logic of process
Deployment Flow Chart (Swim Lane Chart)	Identifies functional responsibilities	Communicates who does what
Value-Added Flow Chart	Separates Value-Added from Non-Value-Added operations.	Identifies waste of many types. Stratifies time.
Spaghetti Diagram	Shows physical flow of material and/or information.	Illustrates physical complexity, distance traveled, cycle time
Value Stream Map	Identifies physical flow of materials and information. Quantifies inventory levels, process characteristics and control mechanisms.	Detailed map for lean improvement projects and Kaizen events.
System Diagram	Focused on systemic cause and effect - shows reinforcing and balancing forces along with unintended consequences.	Examines behaviors behind process performance - non-linear.

Note: None of these map types is mutually exclusive - you can customize your map to add elements drawn from different map types to suit the requirements of your project.

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Swim Lane Chart Example



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Report Out

Number of Process Steps _____

Total Lead Time Estimate _____

Lead Time Element Summary

QUEUES _____ %

DELAYS _____ %

MOVES _____ %

ASSURANCES _____ %

TOTAL NVA _____ %

RUNS [VALUE ADDED] _____ %

Observations?

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Plan for data verification?

WHAT	WHO	BY WHEN

Notes:

Take lots of pictures!

SESSION 3**IDENTIFY PROBLEMS, SOLUTIONS, & PLAN*****See the Future!*****Review verified data**

Did we?

Capture the TRUTH!**Identify “opportunities for improvement” (i.e. problems)**

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Clarify and prioritize problems

Brainstorm solutions – “low cost and no cost”

What can we *IMPLEMENT NOW* [Just-Do-Its] ?

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Create an action plan (include date for results follow-up presentation)

<u>Action Plan</u>				
WHAT	WHO	BY WHEN		
Measures	Current	Target	Actual	%Improve
<u>Follow-up Plan</u>				

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“Quickie Kaizen”

[Example courtesy of Pete Mowry – C&D Zodiac Santa Maria, CA]

Process – Lost Tools Part Number – Tools	QUICKIE KAIZEN SHEET	Originator – Joe St. Amand Date 5/21/12
Observation <div style="border: 1px solid black; padding: 5px; width: fit-content;"> <p>Tools <u>can't</u> be found when they are needed or are broken and a replacement has not been ordered.</p> </div>	Counter measure <div style="border: 1px solid black; padding: 5px; text-align: center;">  <p>Lockable tool box!</p> </div>	
Problem <div style="border: 1px solid black; padding: 5px; width: fit-content;"> <p>Tools have gone missing or are used improperly resulting in damage. There is no current method to control issuing tools from a locked location.</p> </div>	Result <div style="border: 1px solid black; padding: 5px; width: fit-content;"> <p>Valuable specialty tools are <u>kept</u> under lock and key. They are <u>issued</u> upon request.</p> </div>	Implementation Date 5/21/12

Note: Send any “quickie kaizen” sheets to Eric Olsen at eolsen@calpoly.edu if you would like to share them on the Central Coast Lean website.

Central Coast Lean - www.cob.calpoly.edu/centralcoastlean/

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Report Out: Present results and plans to management

[Modify as appropriate]

- **Welcome**
- **“Opportunity” overview**
- **What we learned**
- **“Walk the walls” – Analysis Results**
- **Plan presentation(s)**
- **Questions from guests**
- **Reflections on the process**
- **Thanks**

Celebrate Success!

[Now for the hard part – implementing and sustaining...]

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First Follow-up Agenda (typical)

1. Recap – What did we learn?

2. Measures?

3. Action Plan(s)

What

Priority

Who

By when

4. Schedule next follow-ups?

5. Schedule celebration?

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Facilitator contact info:

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Eric Olsen, PhD  
Cal Poly - Orfalea College of Business - Industrial Technology  
Bldg: 03 Rm: 435, 1 Grand Ave, San Luis Obispo, CA 93407-0383  
office: 805 756-1754 cell: 805 602-0228 e-mail: [eolsen@calpoly.edu](mailto:eolsen@calpoly.edu)  
webpage: [cob.calpoly.edu/faculty/eric-olsen/](http://cob.calpoly.edu/faculty/eric-olsen/)

***Central Coast Lean - [www.cob.calpoly.edu/centralcoastlean/](http://www.cob.calpoly.edu/centralcoastlean/)***  
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Useful and interesting websites:

<http://www.lean.org/>

<http://www.moresteam.com/>

<http://www.isixsigma.com/>

<http://www.ame.org/>

http://www.artoflean.com/tps_history.htm (TPS Video)

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APPENDIX

Example Data from Grants Process Kaizen Event – Spring 2009

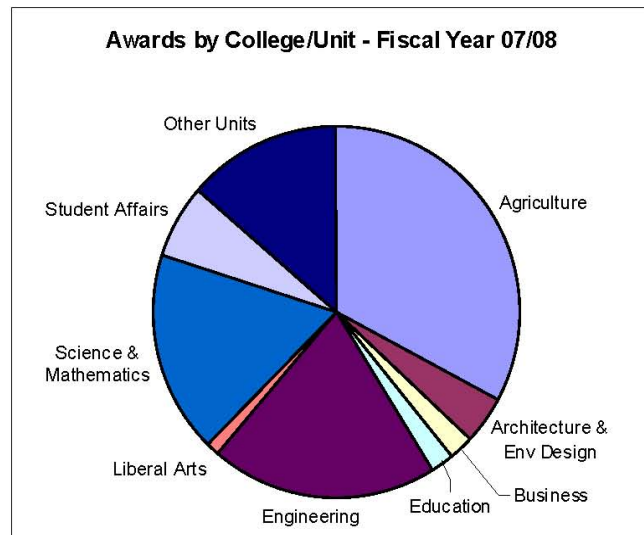
EXHIBIT ONE: COMPARISON OF AWARDS BY COLLEGE 06/07 – 07/08

	7/1/06 - 6/30/07				7/1/07 - 6/30/08				Per Capita \$
	# Faculty	% of Total	# Awards	Award \$	# Faculty	% of Total	# Awards	Award \$	
Agriculture	39	42.39%	80	\$5,920,510	46	49.46%	96	\$8,331,627	\$89,587
Architecture & Env Design	9	14.75%	16	\$1,672,745	7	12.73%	16	\$1,056,940	\$19,217
Business	4	9.09%	5	\$76,586	3	6.25%	4	\$560,553	\$11,678
Education	3	21.43%	3	\$450,650	3	25.00%	4	\$461,724	\$38,477
Engineering	28	23.93%	41	\$2,979,313	35	29.91%	55	\$5,111,213	\$43,686
Liberal Arts	6	4.38%	11	\$746,013	4	2.80%	8	\$237,552	\$1,661
Library	1	12.50%	1	\$7,300	0	0.00%	0	\$0	\$0
Science & Math	27	21.77%	46	\$3,942,184	23	19.49%	43	\$4,524,820	\$38,346
Student Affairs	6		10	\$1,282,565	7		12	\$1,638,174	
Other Units	5		12	\$5,094,613	6		11	\$3,423,096	
Total:	128	21.44%	225	\$22,172,480	134	22.56%	249	\$25,345,698	\$42,670

EXHIBIT TWO:

SUMMARY OF AWARDS BY COLLEGE/UNIT

Fiscal Year 07/08	
College	Support
Agriculture	\$8,331,627
Architecture & Env Design	\$1,056,940
Business	\$560,553
Education	\$461,724
Engineering	\$5,111,213
Liberal Arts	\$237,552
Science & Mathematics	\$4,524,820
Student Affairs	\$1,638,174
Other Units	\$3,423,096
Total	\$25,345,699

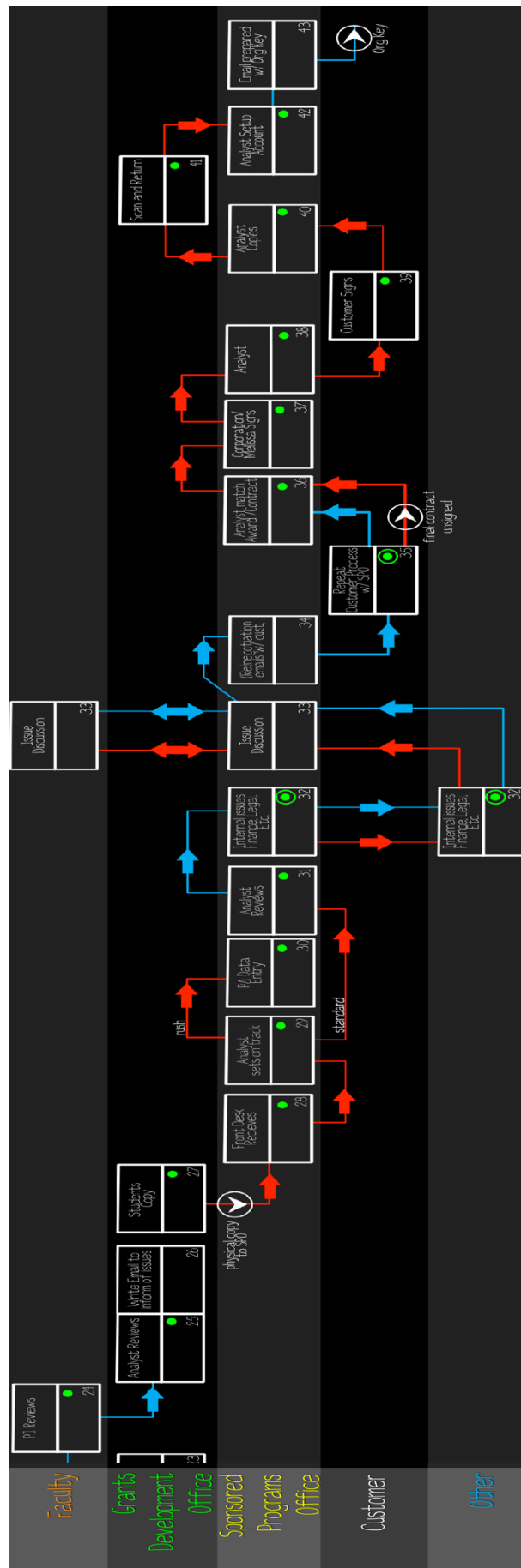
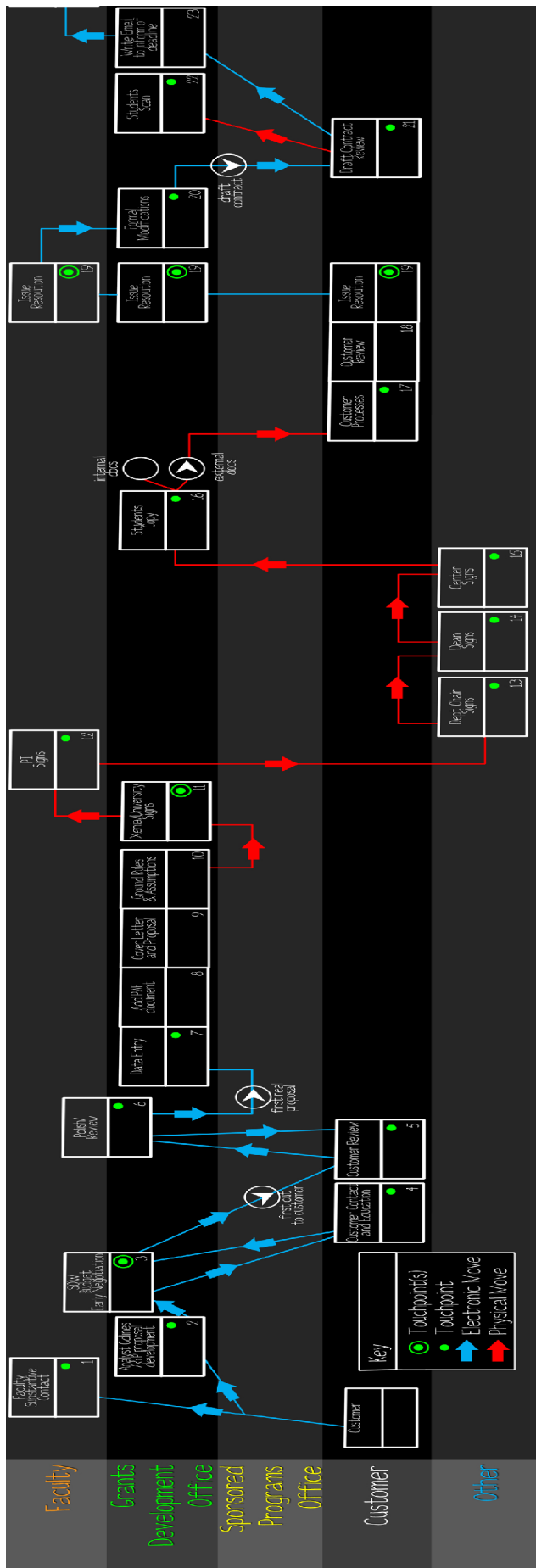


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EXHIBIT THREE: "THE SWIM LANE"



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EXHIBIT FOUR: THE PROCESS CLASSIFIED

	#	Process Step	R	A	Q	D	M	Classification Sequence	Who	Time	Time min (hrs)	% Tot	Time max (hrs)	% Tot	Var max-min (hrs)
Research and Contract Formation	1	Substantive Faculty Contact with GDO	R			D		R, D	GDO/Faculty	15 min(1 day)	24.25	2.3%	24.25	0.7%	0
	2	Analyst Guidelines/RFP Proposal		A	Q			Q, A	GDO	45 min	0.75	0.1%	0.75	0.0%	0
	3	Statement of Work	R					R	GDO/Faculty	2 - 4 weeks	336	31.3%	672	20.1%	336
	4	Draft Budget		A	Q			Q, A							
	5	Deliverables		A				A							
	6	Customer Education/Contact		A				A							
	7	Early Negotiations	R		Q			Q, R	GDO/Faculty/R&G						0
	8	First Cut to Customer					M	M	GDO	1 hr	1	0.1%	1	0.0%	0
	9	Customer Review		A				A	Sponsor	2 days - 1 week	48	4.5%	168	5.0%	120
	10	Polish/Review		A	Q			Q, A	GDO/Faculty	1 hr	1	0.1%	1	0.0%	0
	11	First Real Proposal		A				A	GDO	15 min	0.25	0.0%	0.25	0.0%	0
	12	Data Entry		A	Q		M	Q, A, M	GDO	15 min	0.25	0.0%	0.25	0.0%	0
	13	Cover Letter/Proposal		A				A	GDO	15 min	0.25	0.0%	0.25	0.0%	0
	14	Internal Signature/PAF		A	Q			Q, A	GDO/Dir	15 min	0.25	0.0%	0.25	0.0%	0
	15	Ground Rules & Assumptions	R		Q			Q, R	GDO	30 min	0.5	0.0%	0.5	0.0%	0
			4	10	7	1	2				412.5	38.5%	868.5	25.9%	456.0
University Sign-off	16	Xenia Signs		A		D	M	M, A, D	Dir	15 min	0.25	0.0%	0.25	0.0%	0
	17	Univ \$ signs (GDO)		A		D	M	M, A, D	Campus	1 hr - 1 day	1	0.1%	24	0.7%	23
	18	PI signs		A		D	M	M, A, D	PI						
	19	Dept Chair signs		A		D	M	M, A, D	Dept Chair						
	20	Dean and Center Signs		A		D	M	M, A, D	Dir						
	21	to GDO					M	M	GDO						0
	22	Students Copy			Q	D		Q, D	Student	45 min	0.75	0.1%	0.75	0.0%	0
	23	Internal Docs				D		D							
24	External Docs				D		D							0	
			0	5	1	8	6				2	0.2%	25	0.7%	23
Customer Input	25	Send to Customer					M	M	GDO	15 min	0.25	0.0%	0.25	0.0%	0
	26	Customer Processes				D	D	D	Sponsor	1 day - 2 weeks	24	2.2%	336	10.0%	312
	27	Review				D	D	D	GDO/Sponsor/R&G						
	28	Issue Resolution	R			D	R, D								
	29	Formal Modifications		A			A	A	GDO		30 min	0.5	0.0%	0.5	0.0%
	30	Draft Contract (faculty)		A		D	A, D	A, D	Faculty	1 day	24	2.2%	24	0.7%	0
	31	Draft Contract (cust.)		A			M	M, A	Sponsor	1 - 2 weeks	168	15.7%	336	10.0%	168
32	Customer sends to GDO (unsigned)					M	M	Sponsor	1 day	24	2.2%	24	0.7%	0	
			1	3	0	4	3				240.75	22.5%	720.75	21.5%	480

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	#	Process Step	R	A	Q	D	M	Classification Sequence	Who	Time	Time min (hrs)	% Tot	Time max (hrs)	% Tot	Var max min (hrs)
Internal Processes	33	GDO recieves			Q			Q	GDO	1 day	24	2.2%	24	0.7%	0
	34	Students Scan				D		D	Student	30 min	0.5	0.0%	0.5	0.0%	0
	35	Email - Analyst, PI, SPO w/deadline				D		D	GDO	6 min	0.1	0.0%	0.1	0.0%	0
	36	PI reviews		A				A	PI	2 hrs - 2 weeks	2	0.2%	336	10.0%	334
	37	Analyst Reviews		A	Q			Q, A	GDO	1 - 2 weeks	168	15.7%	336	10.0%	168
	38	More issues?				D		D	GDO/Faculty	???		0.0%	0	0.0%	0
	39	GDO Analyst emails SPO w/ or w/o issues			Q	D		D, Q	GDO	10 min	0.167	0.0%	0.167	0.0%	0
	40	Students Copy package for GDO				D		D	Student	10 min	0.167	0.0%	0.167	0.0%	0
	41	Original goes to SPO					M	M	Student	15 min	0.25	0.0%	0.25	0.0%	0
	42	Front Desk					M	M	SPO						0
	43	Rush or Standard?		A				A	SPO	??		0.0%	0	0.0%	0
	44	Analyst Review (\$, Insur, etc)		A	Q	D		Q, A, D	SPO	1 hr	1	0.1%	1	0.0%	0
	45	(PA Data Entry) - if standard		A	Q	D		Q, A, D	SPO	< 1 hr	1	0.1%	1	0.0%	0
	46	Contact Others - internal, legal, etc.		A	Q	D		Q, A, D	SPO		24	2.2%	336	10.0%	312
	47	Communicate with PI on issues		A				A	SPO			0.0%	0	0.0%	0
Renegotiation			0	7	6	8	2				221.18	20.6%	1035.18	30.9%	814
	48	PI/Sponsor Questions and Issues		A				A	SPO/Faculty	1 day - 2 weeks					0
	49	Renegotiate email with customers		A				A	SPO/Customer						0
	50	Customer Process Repeat (w/ SPO)		A		D		A, D	SPO/Customer	??		0.0%	0	0.0%	0
	51	"Final" Contract unsigned by customer					M	M	Customer	1 day	24	2.2%	24	0.7%	0
Award			0	3	3	4	5				24	2.2%	24	0.7%	0
	52	SPO Analyst (match award & contract)		A				M, A, M	SPO	15 min	0.25	0.0%	0.25	0.0%	0
	53	Corporation signs (Melissa)		A				A	SPO	15 min	0.25	0.0%	0.25	0.0%	0
	55	Send to Customer	R					M, R	Customer	1 - 4 weeks	168	15.7%	672	20.1%	504
Account Formation			1	3	3	3	4		Customer	1 - 4 weeks	168.5	15.7%	672.5	20.1%	504
	56	Customer Signs		A				A	Customer	1 - 4 weeks					0
	57	Send to SPO					M	M	Customer	1 - 4 weeks					0
	58	SPO Analyst Copy			Q			M, Q, M	SPO	45 min	0.75	0.1%	0.75	0.0%	0
	59	Original goes to GDO					M	M	GDO	45 min		0.0%	0	0.0%	0
	60	Scan and Return			Q	D	M	Q, M, D	Student	45 min		0.0%	0	0.0%	0
	61	SPO Analyst, set up account	R					R	SPO	2 - 3 hrs	2	0.2%	3	0.1%	1
	62	Email PI/Org Key!		A				A	SPO	10 min	0.167	0.0%	0.167	0.0%	0
	63	File, SPO Analyst		A				A	SPO	15 min	0.25	0.0%	0.25	0.0%	0
			1	4	6	7	11				3.17	0.3%	4.17	0.1%	1
			7	35	26	35	33				1072.10	100.0%	3350.10	100.0%	2278
										DAYS =	44.7		139.6		94.9

Kaizen: PAC Nutcracker Process

EXHIBIT FIVE: DATA

GDO#	Sent/Date	Status	Contract Recd	Copy To GDO	Copy To PI	Copy To SPO	GDO review complete	Hard copy Contract file To SPO	Contract Fully Exec	Contract fully executed in excess of 30 days from distribution to GDO, PI, and SPO
08-001	7/17/2007	Awarded	3/26/2008	3/28/2008	3/28/2008	3/28/2008	4/9/2008	4/10/2008	4/18/2008	
08-010	9/11/2007	Awarded	4/14/2008	4/15/2008	4/15/2008	4/15/2008	4/23/2008	4/23/2008	4/25/2008	
08-019	7/20/2007	Awarded	7/10/2007	7/11/2007	7/11/2007	7/11/2007	7/19/2007	7/20/2007	8/10/2007	
08-021	7/12/2007	Awarded	12/27/2007	12/28/2007	12/28/2007	12/28/2007	1/18/2008	1/20/2008	4/1/2008	Contract fully executed in excess of 60 days from distribution to GDO, PI, and SPO
08-023	8/8/2007	Awarded	8/22/2007	8/24/2007	8/24/2007	8/24/2007	8/24/2007	8/28/2007	8/28/2007	
08-024	8/8/2007	Awarded	8/22/2007	8/24/2007	8/24/2007	8/24/2007	8/24/2007	8/28/2007	8/28/2007	
08-025	8/8/2007	Awarded	8/22/2007	8/24/2007	8/24/2007	8/24/2007	8/24/2007	8/28/2007	8/28/2007	
08-026	8/8/2007	Awarded	8/22/2007	8/24/2007	8/24/2007	8/24/2007	8/24/2007	8/28/2007	8/28/2007	
08-031	8/16/2007	Awarded	4/4/2008	4/4/2008	4/4/2008	4/4/2008	4/14/2008	4/14/2008	6/11/2008	
08-037	7/27/2007	Awarded	2/8/2008	2/12/2008	2/12/2008	2/12/2008	3/18/2008	3/18/2008	3/26/2008	
08-038	7/31/2007	Awarded	9/7/2007	9/10/2007	9/10/2007	9/10/2007	10/9/2007	10/10/2007	10/25/2007	
08-053	10/15/2007	Awarded	11/5/2007	11/6/2007	11/6/2007	11/6/2007	11/6/2007	11/8/2007	11/15/2007	
08-054	8/24/2007	Awarded	8/23/2007	8/24/2007	8/24/2007	8/24/2007	8/24/2007	8/24/2007	8/28/2007	
08-057	8/24/2007	Awarded	11/15/2007	11/15/2007	11/15/2007	11/15/2007	11/20/2007	11/26/2007	11/28/2007	
08-059	9/7/2007	Awarded	9/24/2007	9/24/2007	9/24/2007	9/24/2007	9/24/2007	9/25/2007	9/26/2007	
08-062	9/4/2007	Awarded	2/11/2008	2/11/2008	2/11/2008	2/11/2008	2/20/2008	2/11/2008	5/2/2008	
08-072	4/14/2008	Awarded	11/7/2007	4/14/2008	4/14/2008	4/14/2008	4/4/2008	4/14/2008	4/14/2008	
08-073	4/16/2008	Awarded	3/19/2008	3/21/2008	3/21/2008	3/21/2008	4/4/2008	4/16/2008	5/19/2008	
08-086	10/24/2007	Awarded	9/18/2007	10/15/2007	10/15/2007	10/15/2007	10/16/2007	10/24/2007	12/18/2007	
08-098	11/15/2007	Awarded	10/29/2007	10/29/2007	10/29/2007	10/29/2007	11/6/2007	11/15/2007	11/30/2007	
08-105	10/29/2007	Awarded	5/21/2008	5/21/2008	5/21/2008	5/21/2008	5/29/2008	5/30/2008	6/18/2008	
08-109	10/11/2007	Awarded	10/15/2007	10/16/2007	10/16/2007	10/16/2007	10/17/2007	10/18/2007	10/18/2007	
08-116	10/25/2007	Awarded	9/12/2007	11/6/2007	11/6/2007	11/6/2007	11/30/2007	12/5/2007	3/11/2008	
08-120	1/7/2008	Awarded	3/4/2008	3/4/2008	3/4/2008	3/4/2008	3/13/2008	3/21/2008	4/4/2008	
08-129	11/29/2007	Awarded	11/14/2007	11/14/2007	11/14/2007	11/14/2007	11/19/2007	11/20/2007	12/7/2007	
08-132	11/21/2007	Awarded	7/11/2008	7/14/2008	7/14/2008	7/14/2008	7/16/2008	7/17/2008	8/7/2008	
08-144	5/22/2008	Awarded	7/1/2008	7/1/2008	7/1/2008	7/1/2008	7/17/2008	7/17/2008	9/9/2008	
08-145	11/27/2007	Awarded	1/14/2008	1/14/2008	1/14/2008	1/14/2008	1/23/2008	1/25/2008	2/4/2008	
08-160	12/13/2007	Awarded	10/10/2008	10/10/2008	10/10/2008	10/10/2008	10/13/2008	10/16/2008	11/24/2008	
08-165	1/15/2008	Awarded	12/5/2007	12/5/2007	12/5/2007	12/5/2007	1/4/2008	1/6/2008	1/15/2008	
08-166	2/4/2008	Awarded	1/9/2008	2/6/2008	2/6/2008	2/6/2008	1/31/2008	2/6/2008	2/6/2008	
08-167	2/4/2008	Awarded	1/9/2008	2/6/2008	2/6/2008	2/6/2008	1/31/2008	2/6/2008	2/6/2008	
08-168	2/4/2008	Awarded	1/9/2008	2/6/2008	2/6/2008	2/6/2008	1/31/2008	2/6/2008	2/6/2008	
08-169	1/28/2008	Awarded	2/18/2008	2/18/2008	2/18/2008	2/18/2008	2/18/2008	8/22/2008	2/26/2008	
08-170	1/11/2008	Awarded	3/26/2008	3/26/2008	3/26/2008	3/26/2008	4/4/2008	4/16/2008	4/21/2008	
08-171	1/4/2008	Awarded	12/18/2007	12/19/2007	12/19/2007	12/19/2007	12/26/2007	12/27/2007	3/14/2008	
08-173	4/4/2008	Awarded	3/4/2008	3/10/2008	3/10/2008	3/10/2008	3/20/2008	4/4/2008	6/11/2008	
08-180	1/3/2008	Awarded	2/29/2008	3/3/2008	3/3/2008	3/3/2008	3/4/2008	3/4/2008	3/4/2008	
08-190	10/6/2008	Awarded	5/19/2008	5/21/2008	5/21/2008	5/21/2008	9/22/2008	10/6/2008	10/14/2008	
08-207	1/28/2008	Awarded	5/21/2008	5/21/2008	5/21/2008	5/21/2008	6/4/2008	6/11/2008	6/24/2008	
08-211	1/15/2008	Awarded	8/7/2008	8/8/2008	8/8/2008	8/8/2008	8/8/2008	8/13/2008	9/12/2008	
08-212	1/29/2008	Awarded	1/29/2008	1/30/2008	1/30/2008	1/30/2008	1/30/2008	2/1/2008	2/7/2008	
08-217	4/21/2008	Awarded	5/28/2008	5/29/2008	5/29/2008	5/29/2008	5/29/2008	5/30/2008	6/25/2008	
08-218	6/30/2008	Awarded	8/15/2008	8/18/2008	8/18/2008	8/18/2008	8/27/2008	9/9/2008	9/18/2008	
08-220	2/14/2008	Awarded	6/11/2008	6/13/2008	6/13/2008	6/13/2008	6/16/2008	6/13/2008	7/7/2008	
08-222	1/25/2008	Awarded	5/13/2008	5/13/2008	5/13/2008	5/13/2008	6/6/2008	6/17/2008	7/2/2008	
08-223	2/5/2008	Awarded	4/14/2008	4/14/2008	4/14/2008	4/14/2008	4/21/2008	4/22/2008	5/27/2008	
08-228	3/12/2008	Awarded	8/12/2008	8/13/2008	8/13/2008	8/13/2008	8/21/2008	8/26/2008	9/5/2008	
08-231	7/2/2008	Awarded	12/8/2008	12/9/2008	12/9/2008	12/9/2008	12/10/2008	12/15/2008	12/17/2008	
08-232	2/19/2008	Awarded	2/18/2008	2/18/2008	2/18/2008	2/18/2008	2/18/2008	2/22/2008	2/26/2008	
08-244	2/20/2008	Awarded	8/4/2008	8/7/2008	8/7/2008	8/7/2008	8/8/2008	8/11/2008	8/26/2008	
08-247	3/5/2008	Awarded	3/10/2008	3/10/2008	3/10/2008	3/10/2008	3/11/2008	3/12/2008	4/10/2008	
08-251	3/13/2008	Awarded	10/28/2008	11/18/2008	11/18/2008	11/18/2008	11/18/2008	11/19/2008	11/24/2008	
08-258	3/14/2008	Awarded	8/26/2008	8/28/2008	8/28/2008	8/28/2008	9/8/2008	9/10/2008	10/21/2008	
08-263	4/1/2008	Awarded	12/16/2008	12/16/2008	12/16/2008	12/16/2008	12/18/2008	12/22/2008	1/15/2009	
08-264	3/25/2008	Awarded	10/8/2008	10/8/2008	10/8/2008	10/8/2008	10/28/2008	10/29/2008	1/6/2009	
08-265	3/25/2008	Awarded	10/8/2008	10/8/2008	10/8/2008	10/8/2008	10/28/2008	10/29/2008	1/6/2009	
08-275	6/19/2008	Awarded	9/17/2008	9/17/2008	9/17/2008	9/17/2008	7/24/2008	10/3/2008	10/1/2008	
08-276	6/10/2008	Awarded	5/21/2008	6/16/2008	6/16/2008	6/16/2008	5/22/2008	6/2/2008	6/25/2008	
08-278	4/17/2008	Awarded	5/9/2008	5/9/2008	5/9/2008	5/9/2008	5/13/2008	5/14/2008	5/27/2008	
08-285	4/30/2008	Awarded	8/4/2008	8/7/2008	8/7/2008	8/7/2008	8/8/2008	8/11/2008	8/26/2008	
08-286	4/30/2008	Awarded	8/4/2008	8/7/2008	8/7/2008	8/7/2008	8/8/2008	8/11/2008	8/26/2008	
08-289	6/24/2008	Awarded	6/13/2008	6/13/2008	6/13/2008	6/13/2008	6/16/2008	6/24/2008	7/1/2008	
08-292	6/10/2008	Awarded	4/25/2008	5/10/2008	5/10/2008	5/10/2008	5/23/2008	5/30/2008	9/20/2008	
08-299	6/12/2008	Awarded	10/16/2008	10/27/2008	10/27/2008	10/27/2008	10/27/2008	10/27/2008	12/10/2008	
08-306	6/10/2008	Awarded	8/20/2008	8/20/2008	8/20/2008	8/20/2008	8/22/2008	8/25/2008	8/26/2008	
08-309	6/26/2008	Awarded	9/5/2008	9/8/2008	9/8/2008	9/8/2008	9/18/2008	9/19/2008	9/26/2008	
08-310	6/24/2008	Awarded	5/20/2008	5/20/2008	6/24/2008	6/24/2008	6/17/2008	6/24/2008	9/9/2008	
08-321	7/15/2008	Awarded	10/15/2008	10/16/2008	10/16/2008	10/16/2008	10/22/2008	10/24/2008	12/11/2008	
08-322	7/1/2008	Awarded	9/26/2008	9/29/2008	9/29/2008	9/29/2008	9/29/2008	9/29/2008	9/30/2008	
09-003	7/10/2008	Awarded	10/7/2008	10/8/2008	10/8/2008	10/8/2008	10/16/2008	12/11/2008	12/9/2008	
09-012	7/16/2008	Awarded	7/21/2008	7/24/2008	7/24/2008	7/24/2008	7/29/2008	7/29/2008	10/14/2008	
09-016	8/1/2008	Awarded	2/5/2009	2/5/2009	2/5/2009	2/5/2009	2/11/2009	2/17/2009	3/9/2009	
09-019	8/4/2008	Awarded	7/15/2008	7/15/2008	7/15/2008	7/15/2008	8/19/2008	8/25/2008	8/26/2008	
09-020	12/8/2008	Awarded	4/13/2009	4/15/2009	4/15/2009	4/15/2009	4/23/2009	4/23/2009	4/28/2009	
09-022	8/14/2008	Awarded	7/18/2008	8/14/2008	8/14/2008	8/14/2008	8/11/2008	8/14/2008	8/19/2008	
09-032	8/13/2008	Awarded	10/30/2008	11/3/2008	11/3/2008	11/3/2008	11/12/2008	11/17/2008	12/12/2008	
09-034	8/22/2008	Awarded	9/23/2008	9/24/2008	9/24/2008	9/24/2008	9/24/2008	9/25/2008	9/26/2008	

Kaizen: PAC Nutcracker Process

EXHIBIT SIX: HISTORY OF LEAN

The Top 10 Titans of TPS

By Jon Miller | Post Date: February 8, 2009 11:31 PM

I like to connect the history to people because it shows that the Lean philosophy did not come down from the mountaintop; it was created by people working and improving every day. This list of the top 10 titans of TPS is highly subjective and is organized in loose historical order, not in ranking by importance. It's a top 10 list, but we cranked it up to 11. And there are 12 people on the list, if you're counting...

1. **Henry Ford** was the founder of the Ford Motor Company. He revolutionized repetitive manufacturing of automobiles through standardization of parts, the moving assembly line and continuous improvement of product and process. Inspired imitation by Toyoda family to build automobiles. Words of this titan: *"It is not the employer who pays the wages. Employers only handle the money. It is the customer who pays the wages."*

2. **Sakichi Toyoda** was an inventor, industrialist, and founder of Toyota Looms Works. He gave us the jidoka concept, inspired the Toyota Precepts and set the development of the Toyota Production System in motion. Words of the titan: *"Everyone should tackle some great project at least once in their life."*

3. **Charles R. Allen** created and taught the methodologies which were developed into Job Instruction and eventually Training Within Industry during World War II. His book *The Instructor, the Man, and the Job* is mentioned several times in the TWI Report. He also wrote *The Foreman and His Job* with early examples of job breakdown for the foreman. Words of this titan probably said, if not inspired: *"If the learner hasn't learned, the teacher hasn't taught."*

4. **Kiichiro Toyoda** had the vision to exit the loom business and enter the automobile business. He studied modern manufacturing methods and coined the "just in time" production approach which became the second pillar of TPS along with jidoka. Kiichiro also demonstrated principle and leadership by resigning when his company was forced to reorganize and lay off a large number of people.

Quote in reaction to the theft of designs for Toyoda looms: *"They do not have the expertise gained from the failures it took to produce the original. We need not be concerned. We need only continue as always, making our improvements."*

5. **Frank G. Woollard**. Frank who? I learned of the amazing work of Frank Woollard only recently thanks to the book Bob Emiliani rediscovered and published recently, [Principles of Mass and Flow Production](#). It was first published 55 years ago, and Woollard's "Some Notes on British Methods of Continuous Production" dates all the way back to 1925. While it's very possible that the TPS was an independent and parallel invention by Toyota and Woollard's Morris Motors. Bob Emiliani makes a good case for Woollard's work and writing being the direct inspiration for Kiichiro Toyoda and others. This could be the most controversial bit of news to hit the TPS community since... ever! The unknown titan's quote: *"The ideal of continuous flow must be present from the design and raw material stages up to and even beyond the sales stage."*

6. **Eiji Toyoda** had Taiichi Ohno's back all the way as Ohno fought to change the basic way that Toyota manufactured automobiles, trained people and improved processes. Ohno explicitly credits Eiji Toyoda many times in his writing with making his work possible.

Words of this titan to his executives: *"I want you to use your own heads. And I want you actively to train your people on how to think for themselves."*

7. **Frank Gilbreth** and **Lilian Gilbreth** were thought leaders on efficiency improvement. They were cited repeatedly by my teachers as pioneers in practical industrial engineering, and they created the charming movie *Cheaper by the Dozen* which sometimes took efficiency comically a bit too far... Quote from Mr. Gilbreth: *"No person with inner dignity is ever embarrassed."*

8. **Taiichi Ohno** was the man who drove the development and practical application of the Toyota Production System. He taught leadership by example, the 5 why process of root cause analysis, and the relentless kaizen spirit to many. Quote: *"Costs do not exist to be calculated. Costs exist to be reduced."*

9. **Edwards Deming** brought statistical quality control, the PDCA cycle and an entire management philosophy of quality to the Japanese. He had earlier brought the same to the Americans, but we didn't listen... Titan's quote: *"It is not necessary to change, survival is not mandatory."*

10. **Kaoru Ishikawa** made statistical quality improvement tools practical and applicable by identifying the 7 QC Tools as the most accessible and useful to QC Circles. Invented the Ishikawa Diagram, a.k.a. Fishbone Diagram or Cause and Effect Diagram. Quote: *"Quality control begins and ends with education."*

Kaizen: PAC Nutcracker Process

11. **Peter Drucker.** Where to start with this man's contribution... We could say that he wrote the book on modern management. In fact he wrote 39. The results of his in-depth 2-year study of GM was published in 1946, titled Concept of the Corporation. It was not well received by GM, but the instruction on how GM might shore up weak spots across its enterprise was certainly not lost on Japanese automobile manufacturers fighting to catch up with GM and Ford. Drucker promoted the concept of the knowledge worker and consulted with many companies and senior executives, including Shoichiro Toyoda. Three of many great quotes: *"There is nothing so useless as doing efficiently that which should not be done at all."* *"Knowledge has to be improved, challenged, and increased constantly, or it vanishes."* *"Follow effective action with quiet reflection. From the quiet reflection will come even more effective action."*

Runners up, the next 10 or members of the top 20 Titans of TPS:

Eli Whitney - gave us standardized, replaceable parts. **Frederick Taylor** - took the first steps in the scientific (?) study of work. **Walter Shewhart** - Deming's teacher, invented modern statistics. **Joseph Juran** - quality guru. **H.W. Heinrich** - safety first! **Shigeo Shingo** - consultant to Toyota, wrote many books on TPS. **Kikuo Suzumura** - Taiichi Ohno's enforcer and right hand man. **Genichi Taguchi** - made design of experiments accessible. **Noriaki Kano** - created a model to place the focus on customer needs. **Chihiro Nakao** - arguably Ohno's most successful living student

Kaizen: SLO County Facility Services Work Order Process
