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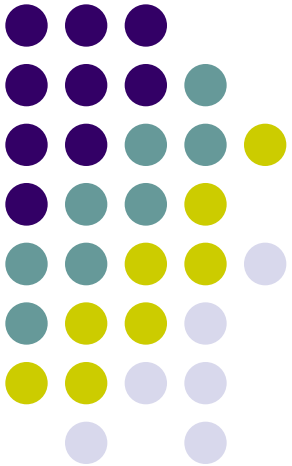
PBM and 6σ

January 2008



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Training Plan

- Session 1: today!
  - Introductions to PBM and Six Sigma
  - LEAN and DMAIC
  - Work on “D”
- Other sessions coming soon…
  - Will cover the other phases and tools in the methodologies

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Power of Process

- PBM – Process Based Management
- 6σ – Six Sigma

- Primary sources:
  - Hammer and Co. (Dr. Michael Hammer)
  - Standard Six Sigma books and methodologies

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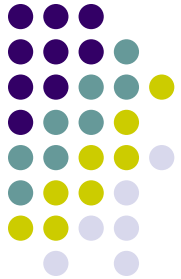
What is PBM?



- The essence of “Process” is End to End Work
- Key ingredients:
  - Design
  - Awareness
  - Metrics
- Contemporary performance problems are process problems, not task problems
- Antidote to non-value-adding work

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Quick exercise #1

- Passing the ball:
  - Everyone must handle the ball
  - Everyone must use both hands
  - Must be in order
  - Must get faster!!!

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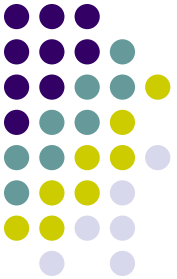
Important Themes



- Elimination of non-value-adding intermediaries
- Performance of only requisite work
- Employee self-management
- Accountability
- Shared metrics
- Standardization
- Outcome focused metrics

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Results

- Increased productivity
- Reduced transaction cost
- Fewer errors
- Large cost reductions

♫ *Process doesn't change what you do but how you do it.*

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Six Sigma

- Knowledge is Power -- Francis Bacon (1561 – 1626)
  - Do you know, REALLY know what is going on in your organization?
- It is a:
  - Statistical basis of measure: 3.4 defects / million
  - Philosophy and goal: As perfect as possible
  - Methodology
  - Symbol of quality

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Probability of defect

Sigma Level	Defects/Million	"Good"
2	308,537	69.1463%
3	66,807	93.3193%
4	6,210	99.3790%
5	233	99.9767%
6	3.4	99.9997%

2006 – 657 million passengers on US airlines. 11,200,000 departures.

50 fatalities (0.08 per million passengers)

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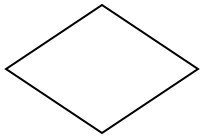
Six Sigma

- Methodologies: Starts with a process map
  - DMAIC
    - Define, Measure, Analyze, Improve, Control
  - LEAN

We will cover both as they are just different set of tools

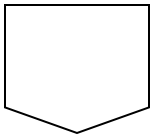
Process Maps - icons

- Process



- Decision

- Terminator



- Off-page connector

- Points in the direction of flow

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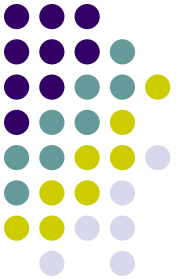
Quick exercise #2



- Mapping out a process

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LEAN

- “Lean is a process of eliminating waste with the goal of creating value for enterprise stakeholders”. – Lean Enterprise Value, Murman et al
- Ideal State:
  - Only value added steps
  - No scrap or rework
  - No stoppages
  - No “churn” or back flow

7 Wastes - examples

- Over production
  - Processing items before the next person needs it
- Waiting
  - System downtime, waiting for information, approvals
- Inventory
  - Boxes of files, phone call backlog, office supplies
- Over processing
  - Re-entering data, extra copies, excessive reports
- Defects
  - Error in the work, invoicing errors, missing information
- Transportation
  - Multiple hand-offs, moving paper around
- Excess Motion
  - Walking to copiers, typing in multiple systems, multiple calls

Quick exercise #3

- Everyone think of a obvious example of “waste” in your respective areas.
- Write it down on a piece of paper.
- STOP
- Read what you wrote down.
- Hand it to the person on your right.
- NOW commit to eliminate that by a certain time!!

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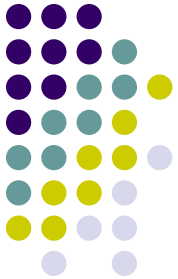
Basic LEAN Tools



- Value Stream Mapping
- 5S
  - Sort, Straighten, Shine, Standardize, Sustain
- Visual Management
- Batch Reduction
- Standard Work
- Cellular Layout
- Pull Systems

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DMAIC

Improving process through reducing variations and defects.

- One significant equation:

  $Y = fX_{(n)}$ (Y is a function of $X_{(1,2,3,etc)}$)

  Basically, to find ways to improve the process, we need to find the few critical “Y”s that defines the quality of the process. Then we need to define and measure and improve the few vital “X”s that impacts that “Y”.

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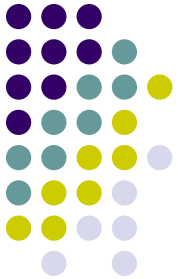
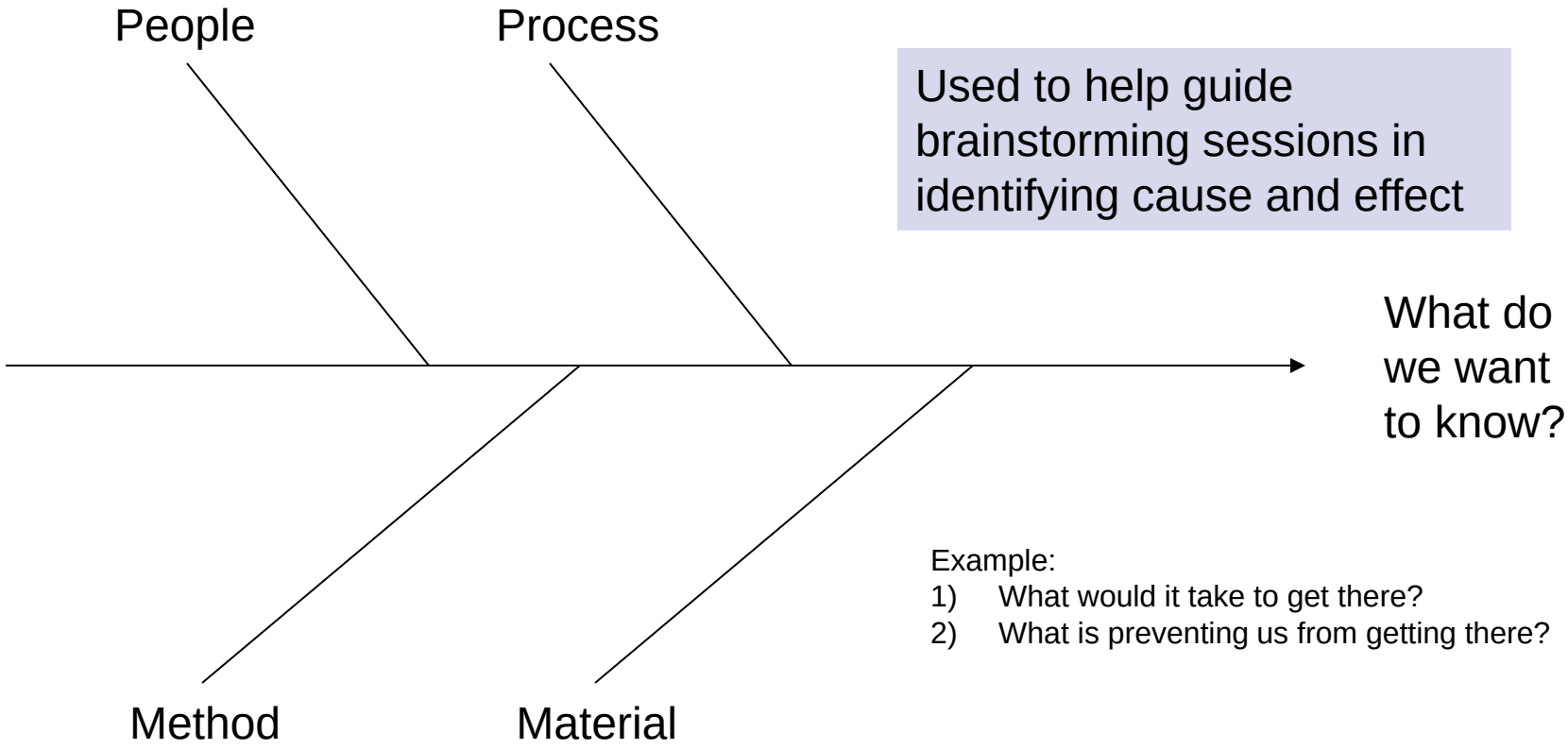
Quick exercise #4



- Get the rubber band in the cup!
- First one to get 3 rubber band into the cup wins!

C&E Diagram



Used to help guide brainstorming sessions in identifying cause and effect

Example:

1) What would it take to get there?
2) What is preventing us from getting there?

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DMAIC (Y=fX)

- DEFINE (Y) – aka CTQ (Critical to Quality)
  1. Identify the important problems of your processes
  2. Select a problem area to improve
  3. Define the parameters of the project
  4. Determine the vital few factors to be measured, analyzed, improved and controlled

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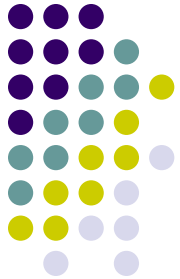
Instruction for “Define”



- Problem statement
  - Detailing when it is seen, what the problem is, the magnitude of the problem, the impact/consequences of the problem
  - KEY: Focus on the symptoms NOT the cause or solution
- Goal statement
  - Clear identification of the key output metric to be improved (Y)
  - KEY: Something that can be measured
- VOC (Voice of the customer)
  - Clear documentation of the expectations of the customers
  - KEY: Make sure it is from the customer, not what we think

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Homework

- Talk about a few process, selecting and defining…

- Bring To Next Class:
  - Process Map
  - Detailed “DEFINE” Document
  - Any measures you might have of the “Y”s
  - General idea about taking your particular project through LEAN, DMAIC or both

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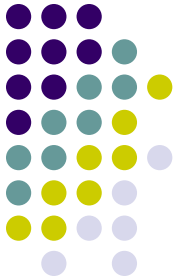
Next Classes



- Measuring
- Analyzing
- Improving
- Controlling

DONE!

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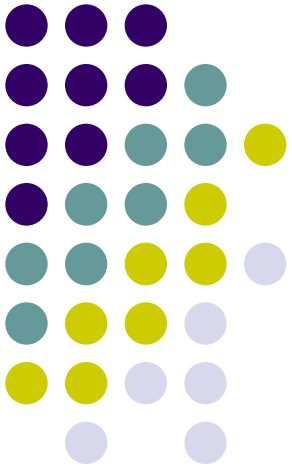
PBM and 6σ

March 2008



Training Plan

- Session 2: today
  - Quiz on Session 1
  - Check homework
  - DMAIC - Measure
    - C&E's
    - Process Mapping
    - VOC
  - LEAN - Analysis
    - "Bottlenecks"
    - VA/NVA Analysis

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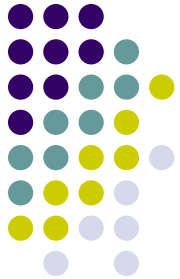
QUIZ



- PBM – ?
- 6σ – ?
- The essence of “Process” is E__ to E__ Work
- D,M,A,I,C
- What is the significant equation in DMAIC
- Define LEAN
- 5 S

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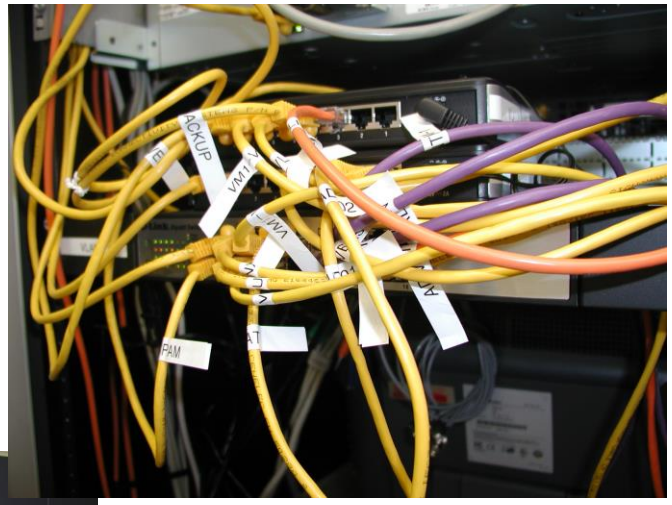
Example of 5S



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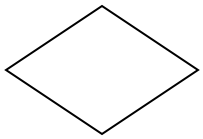
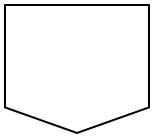
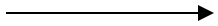
QUIZ - icons







QUIZ - 7 Wastes

- O___ p_____
  - Processing items before the next person needs it
- W_____
  - System downtime, waiting for information, approvals
- I_____
  - Boxes of files, phone call backlog, office supplies
- O___ p_____
  - Re-entering data, extra copies, excessive reports
- D_____
  - Error in the work, invoicing errors, missing information
- T_____
  - Multiple hand-offs, moving paper around
- E____ M_____
  - Walking to copiers, typing in multiple systems, multiple calls

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Homework #1

- Everyone think of an obvious example of “waste” in your respective areas.
- Write it down on a piece of paper.

- How did it go?

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Homework #2

- Talk about a few process, selecting and defining…

- Bring To Next Class:
  - Process Map
  - Detailed “DEFINE” Document
  - Any measures you might have of the “Y”s
  - General idea about taking your particular project through LEAN, DMAIC or both

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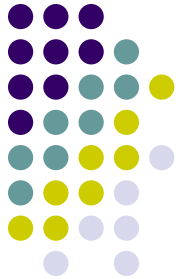
Instruction for “Define”



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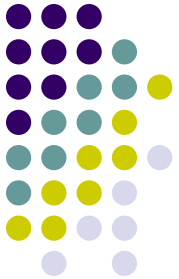
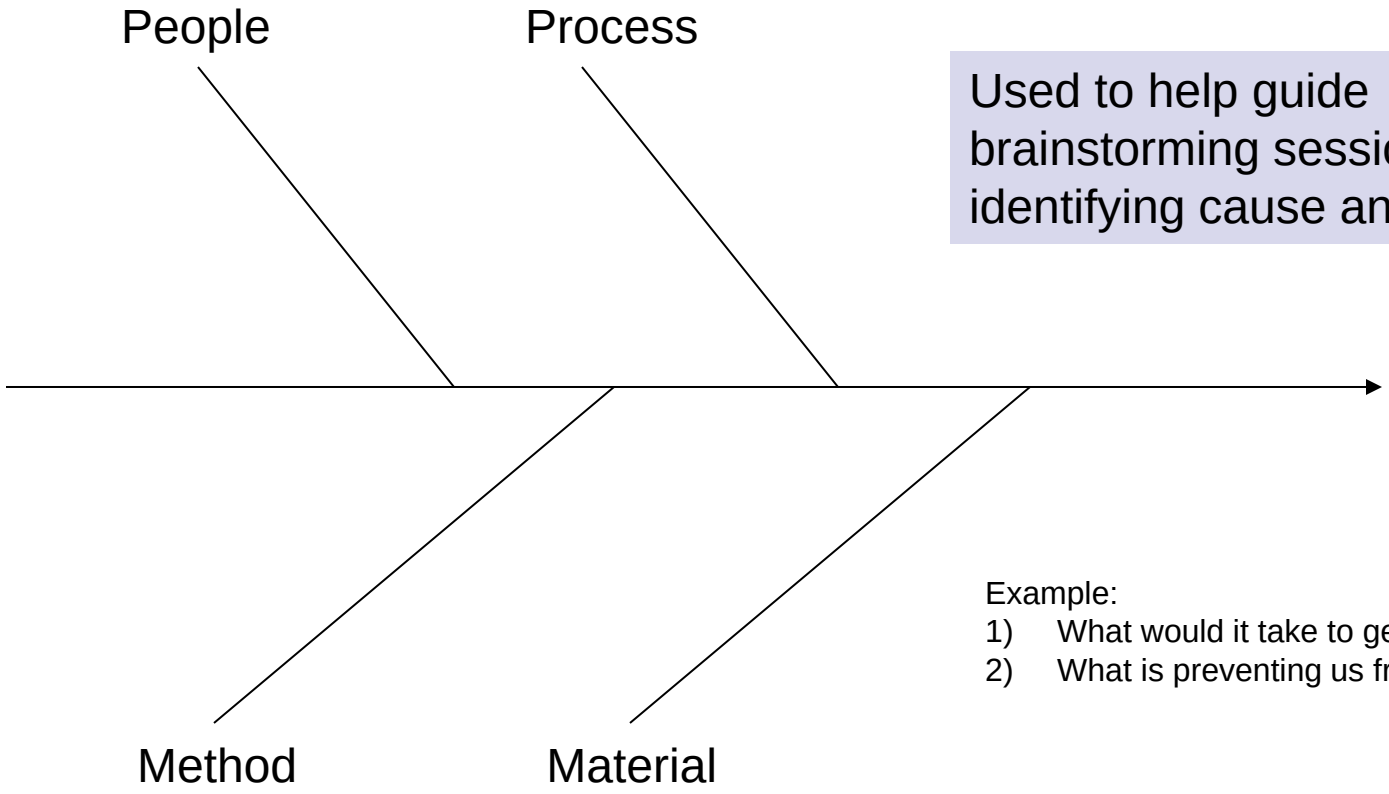
MEASURING



C&E Diagram (What)



Used to help guide brainstorming sessions in identifying cause and effect

Example:
1) What would it take to get there?
2) What is preventing us from getting there?

NEW!! : The 5 "WHYS"

C&E Matrix (Why)

		Temp of coffee	Taste	Strength	Process Output	
	Importance	8	10	6		
Process Steps	**Process Inputs**	**Correlation of Input to Output**				**Total**
Clean Carafe			3	1		36
Fill Carafe with Water			9	9		144
Pour Carafe into Maker			1	1		16
Place filter in Maker			3	1		36

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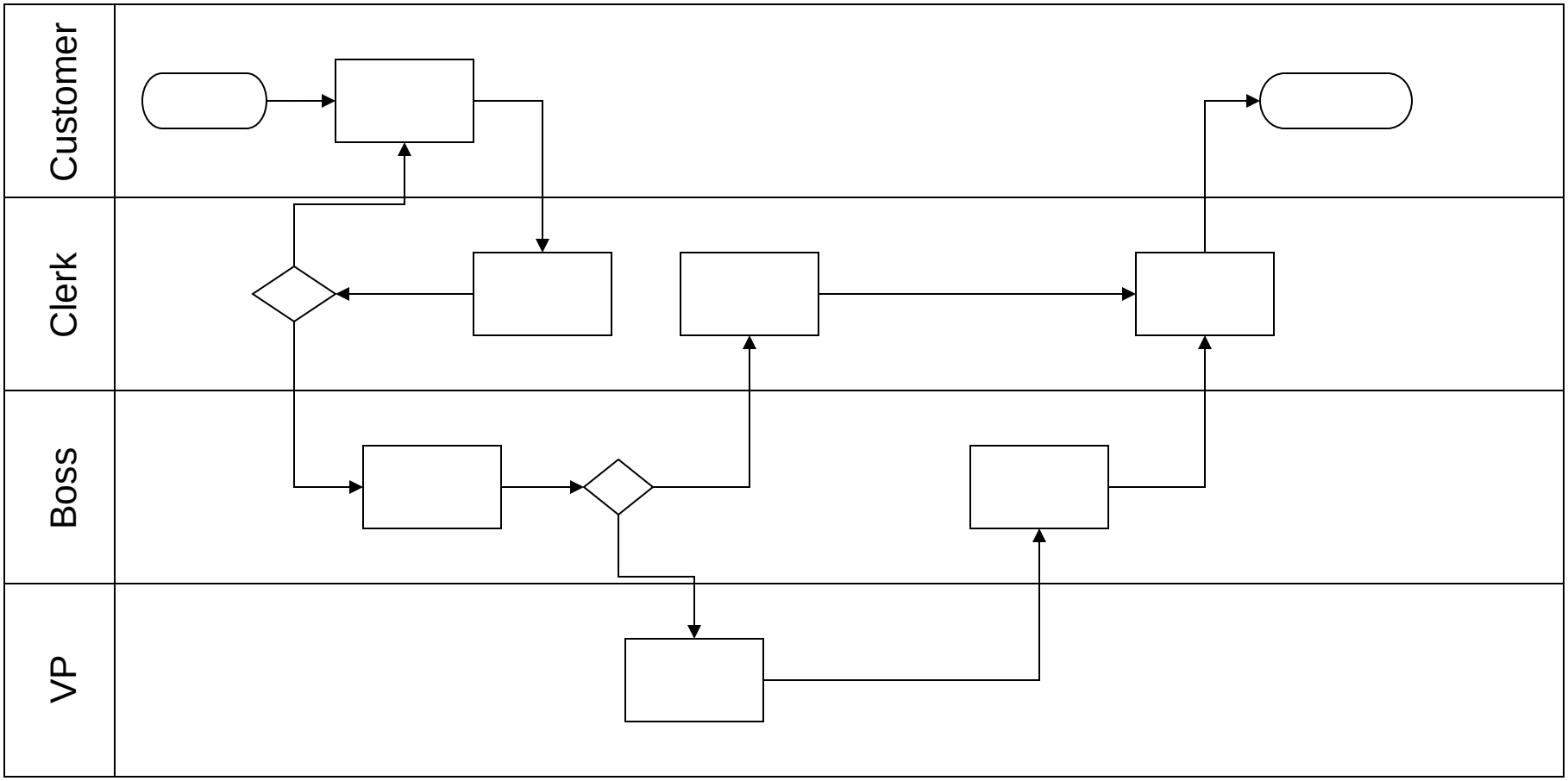
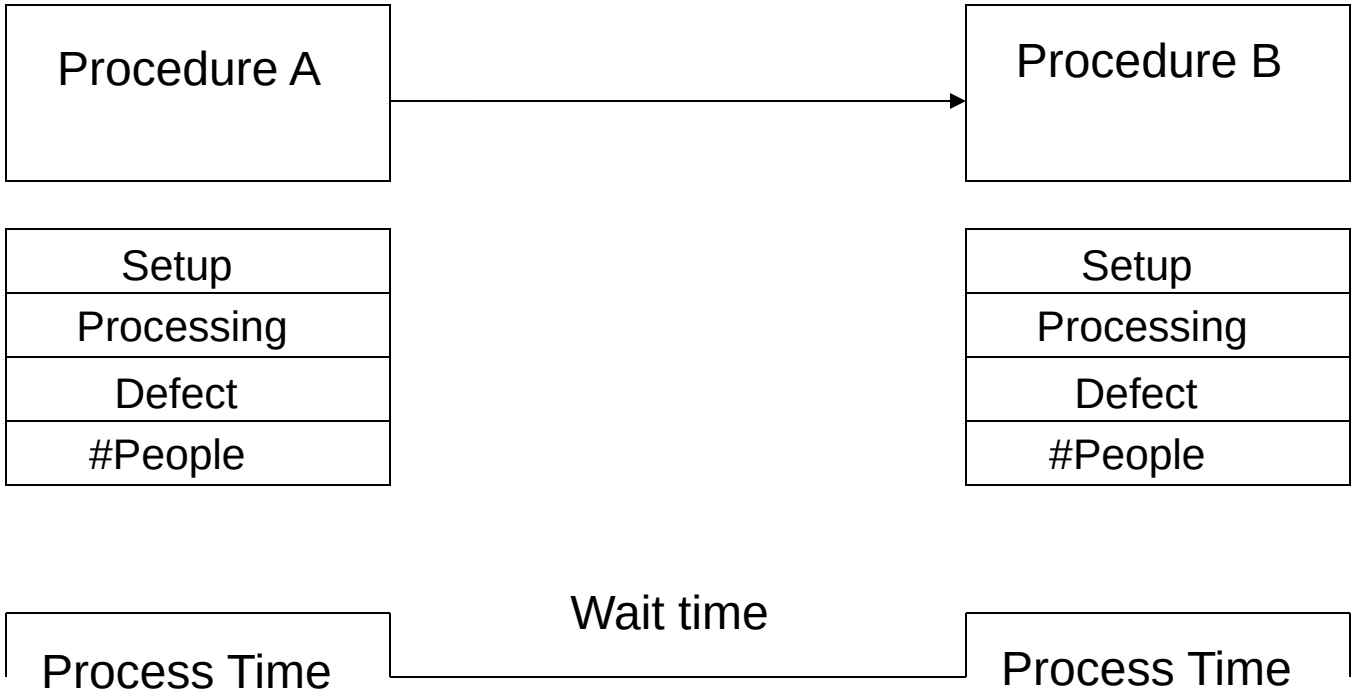
(PM) Swimlanes (Who)



(PM) Simplified Value Stream Map (How long)



VOC (What and How much)

- Kano analysis

Specific Feature		How you feel if this is **NOT addressed**			
		Like	Expected	Don't Care	Don't Like
How you feel if this **IS addressed**	Like		Delighter	Delighter	Satisfier
	Expected				Dissatisfier
	Don't Care				Dissatisfier
	Don't Like				

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Example of “measure”

	Service Tickets	Counter Service *Est'd*	Inventory Transactions	Warranty Orders	Warranty Reimbursments	Non-Warranty Parts Ordered	Non-Warranty Parts Ordered $$	Non-Warranty Parts Charge To Students	Battery replacement
July	33	87	53	24	12	8	$476.68	$55.00	4
August	103	287	420	27	10	86	$5,311.74	$575.00	21
September	106	263	112	25	9	82	$2,807.52	$385.00	31
October	102	252	45	30	9	52	$2,256.87	$280.00	30
November	109	322	23	52	13	32	$2,211.74	$1,000.00	17
December	67	200	46	29	6	3	$701.93	$575.00	10
January	171	508	67	66	14	78	$3,944.72	$2,315.00	26
February	122	357	13	33	5	3	$311.93	$290.00	20
March									
April									
May									
June									

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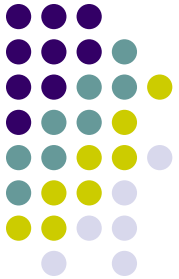
LEAN



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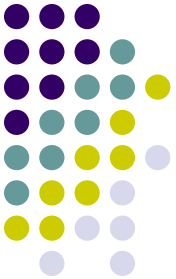
"Bottlenecks"



- Time Traps vs. Capacity Constraints
  - Time traps **insert delays** into a process, typically:
    - Poor management policies
    - Long setup times
    - Machine or human down time
    - Quality problems
  - Capacity constraints **limit the capacity** of the process so that it cannot meet the customer demand.

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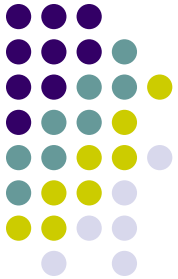
VA/NVA Analysis



- Identify and eliminate the hidden costs that do not add value for the customer
- Reduce unnecessary process complexity
- Reduce the process lead time; improve PCE (Process Cycle Efficiency)
- Increase capacity by better utilizing resources

VA/NVA Analysis

- STEPS:
  - Classify tasks into category and add up the time spent

- Decide what to do:
  - VA tasks should be optimized and standardized
  - Required NVA tasks should be checked with the stakeholders and where possible, minimized or eliminated
  - Waste NVA activities should be eliminated

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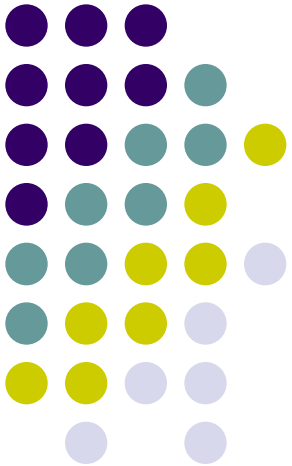
PBM and 6σ

April 2008



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Training Plan

- Session 3:
  - Quiz on Session 2
  - Check homework
  - Follow up questions from previous sessions:
    - Human Sigma
    - Overview of Project Management
      - DMAIC
      - Generic PMI (Initialize, Plan, Execute, Control, Close)
  - Analysis
    - Process (SIPOC and Pareto Analysis)
    - FMEA (Failure Mode and Effect Analysis)

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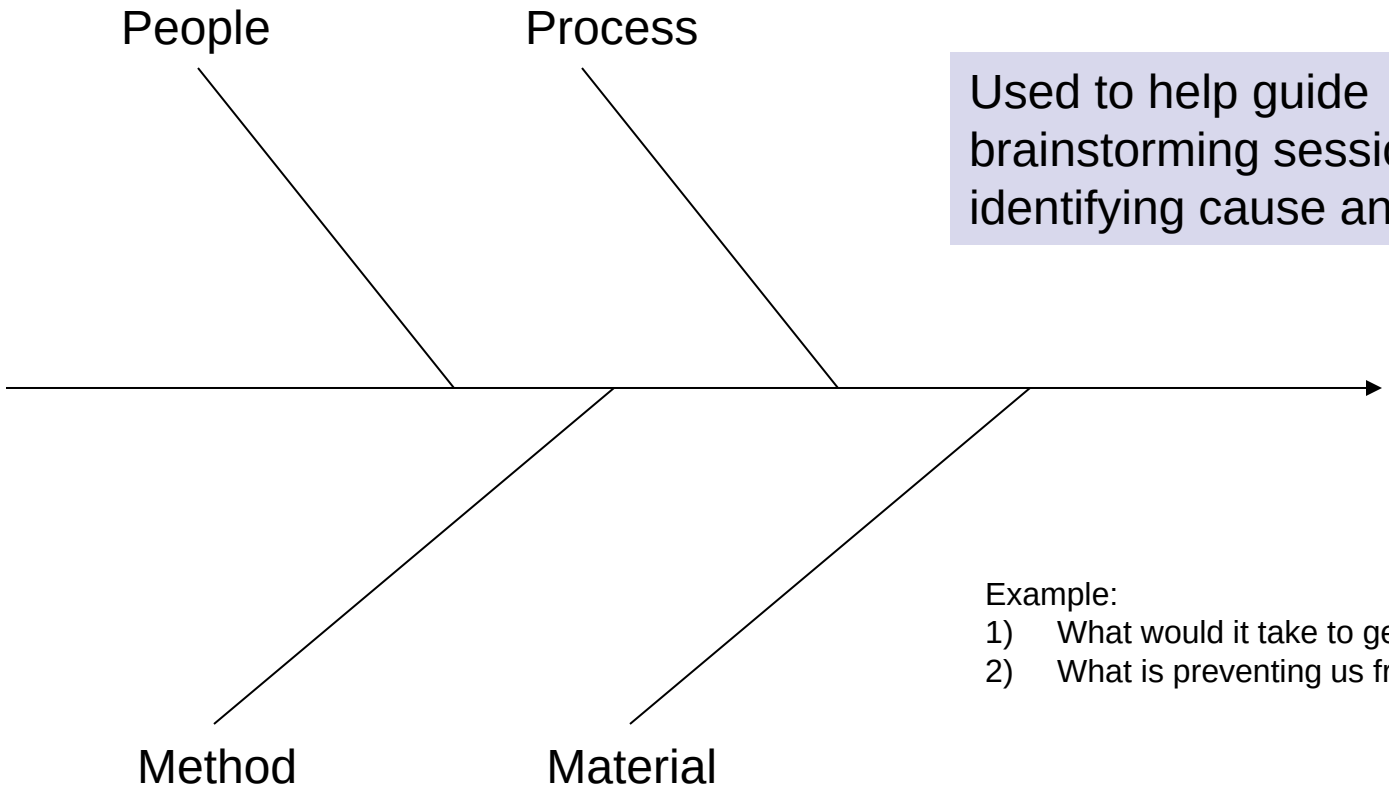
QUIZ

Name? Used For?



Used to help guide brainstorming sessions in identifying cause and effect

Example:
1) What would it take to get there?
2) What is preventing us from getting there?

NEW!! : The 5 "WHYS"

Name? Used For?

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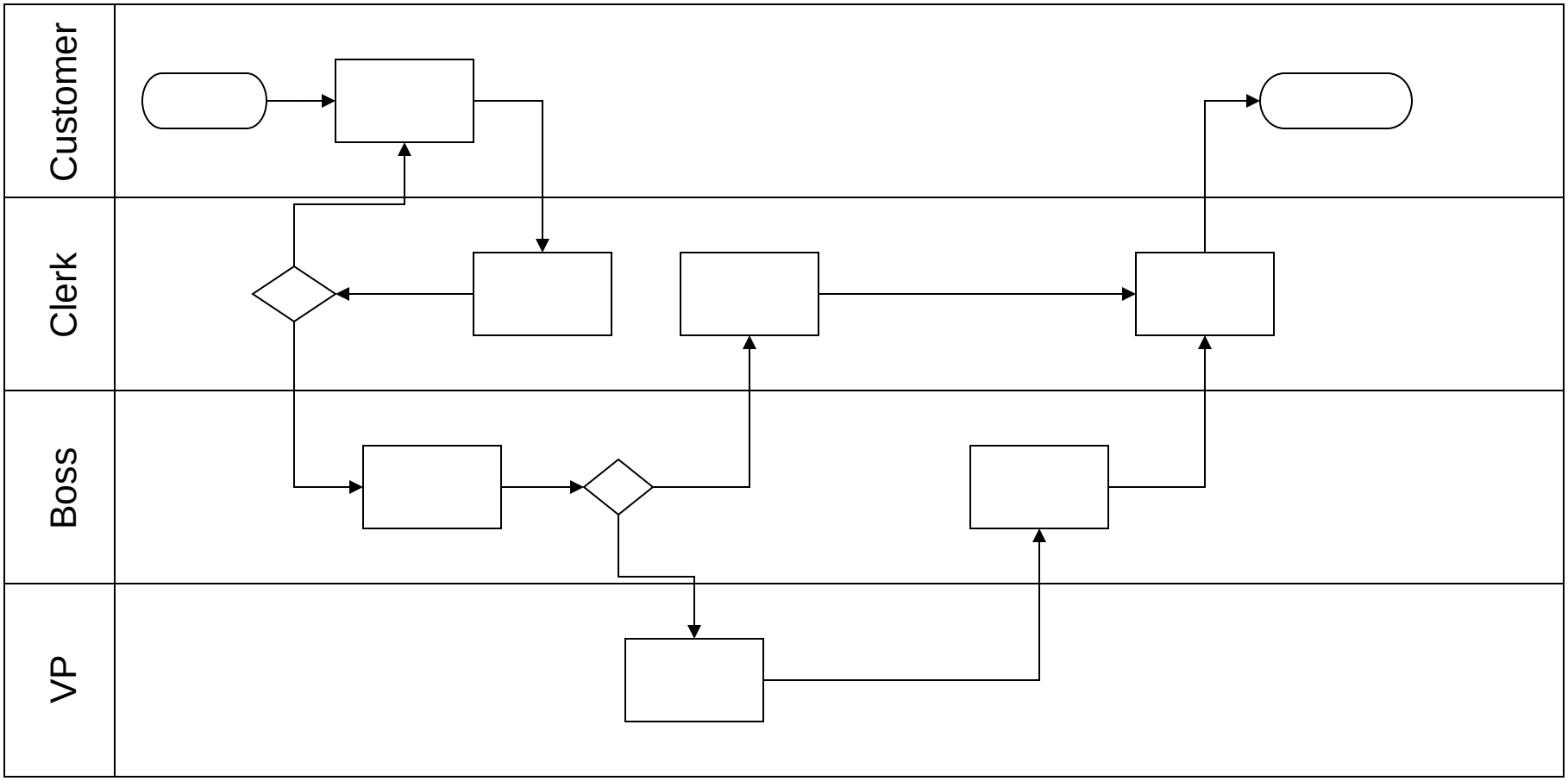
Name? Used For?



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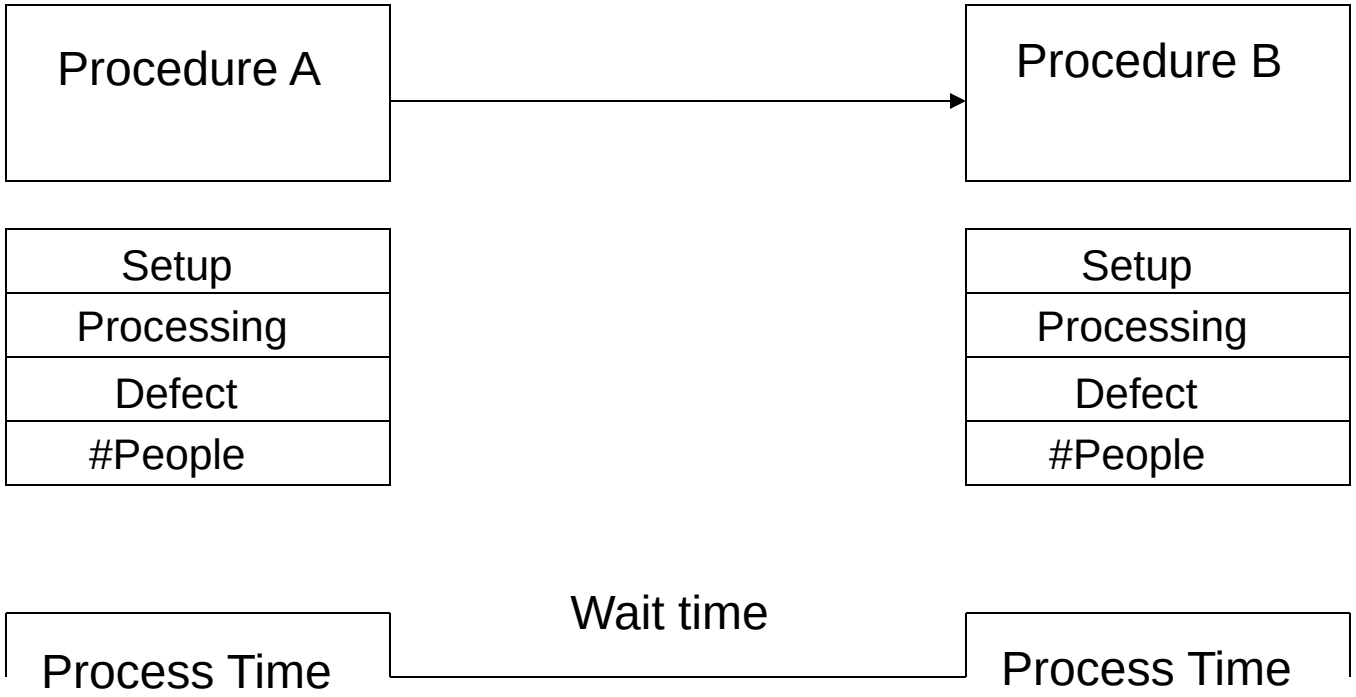
Name? Used For?



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- Name? Used For

Specific Feature		How you feel if this is **NOT addressed**			
		Like	Expected	Don't Care	Don't Like
How you feel if this **IS addressed**	Like		Delighter	Delighter	Satisfier
	Expected				Dissatisfier
	Don't Care				Dissatisfier
	Don't Like				

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"Bottlenecks"

- Time Traps vs. Capacity Constraints
  - _____**insert delays** into a process, typically:
    - Poor management policies
    - Long setup times
    - Machine or human down time
    - Quality problems
  - _____ **limit the capacity** of the process so that it cannot meet the customer demand.

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VA/NVA Analysis

What “types” of work are there?

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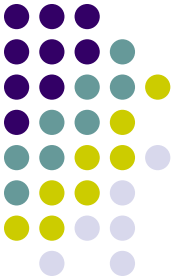
Check homework



- Process Map?
- Define Document?

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Special Guest!

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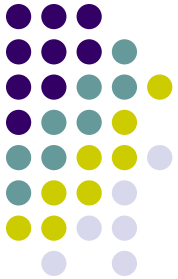
HumanSigma



Six Sigma

- Works to trim the 4 root causes of quality defects: machines, materials, measurements and methods.
- Works best with “things” that can be predicted and controlled.
- Focuses on reducing variability in processes, systems and output quality.
- Focuses on *how*.

HumanSigma

- Works to reduce quality defects in the other root cause of quality defects: people
- Works best with human systems that are challenging to predict and control.
- Focuses on increasing variability in how customer relationships are developed and maintained.
- Focuses on *what*.

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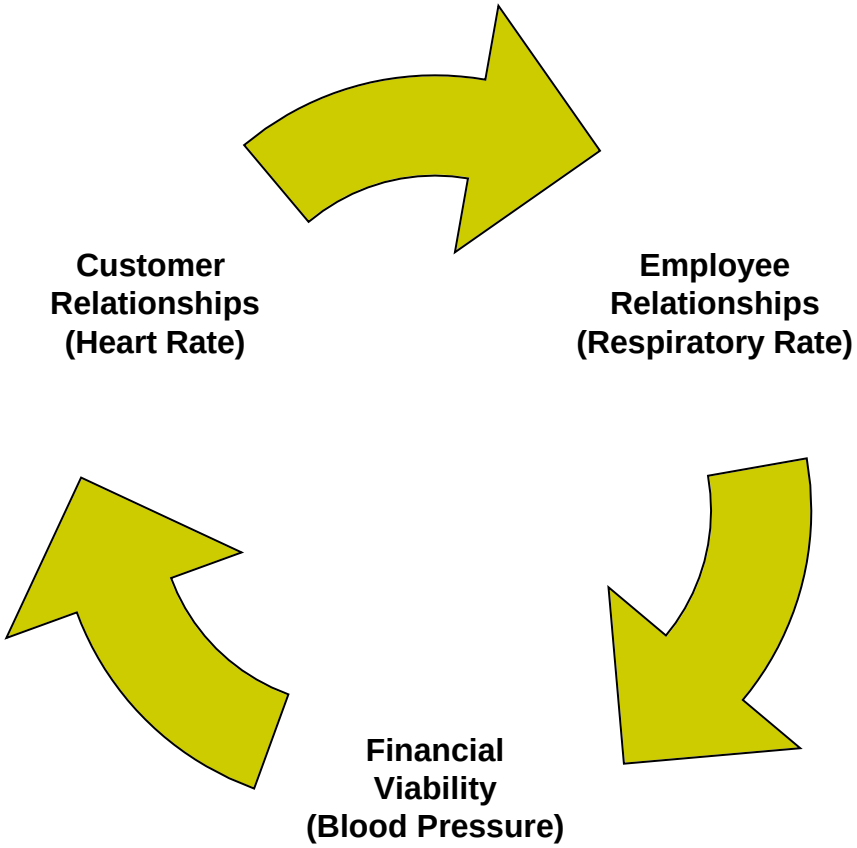
#1: E Pluribus Unum



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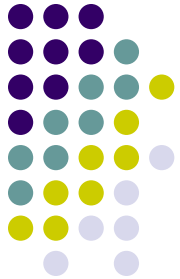
#2: Feelings are Facts



- Three kinds of customers:
  - **Non-Advocates –** not likely to recommend company to others
  - **Rational Advocates –** likely to recommend company to others, but lacks a strong emotional bond with company.
  - **Emotional Advocates –** likely to recommend company to others AND strong emotional bond with company.
- Goal = Inspire passionate, emotional advocacy at every location and touchpoint.

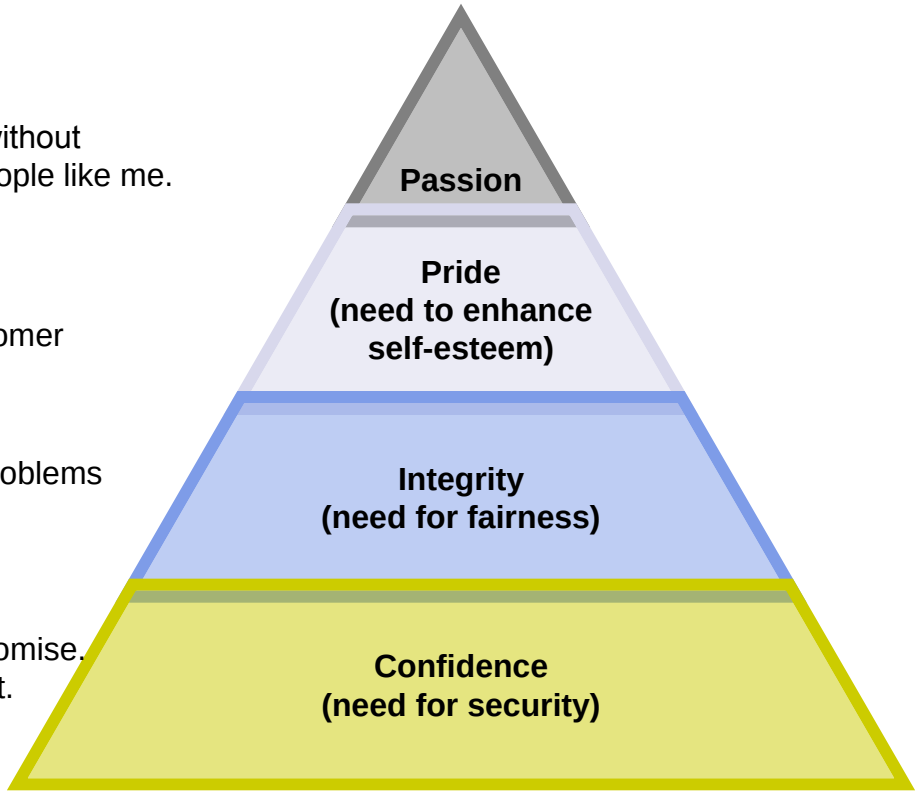
Emotional Attachment Customer

Can't imagine a world without
Perfect company for people like me.

Treats me with respect.
Feel proud to be a customer

Fair resolution of any problems
Always treats me fairly.

Always delivers on a promise.
Name I can always trust.



Emotional Attachment Employee

Opportunities to learn and grow.
Progress in the last 6 months.

Best friend.
Coworkers committed to quality.
Mission/Purpose of the company.
My opinions count.

Encourages development.
Supervisor/Someone at work cares.
Recognition last seven days.
Do what I do best every day.

Materials and equipment
I know what is expected of me.

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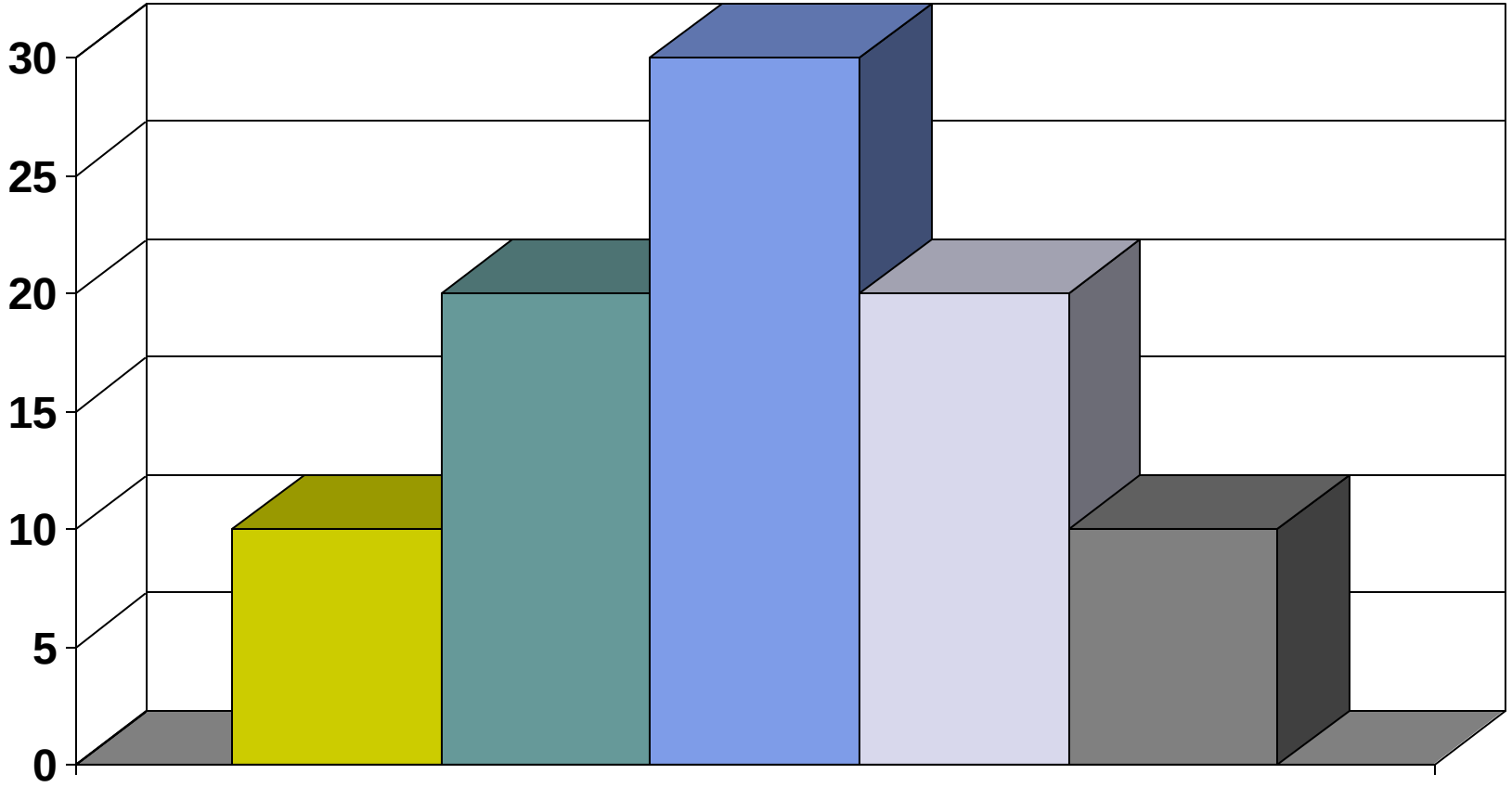
#3 Think Global, Act Local



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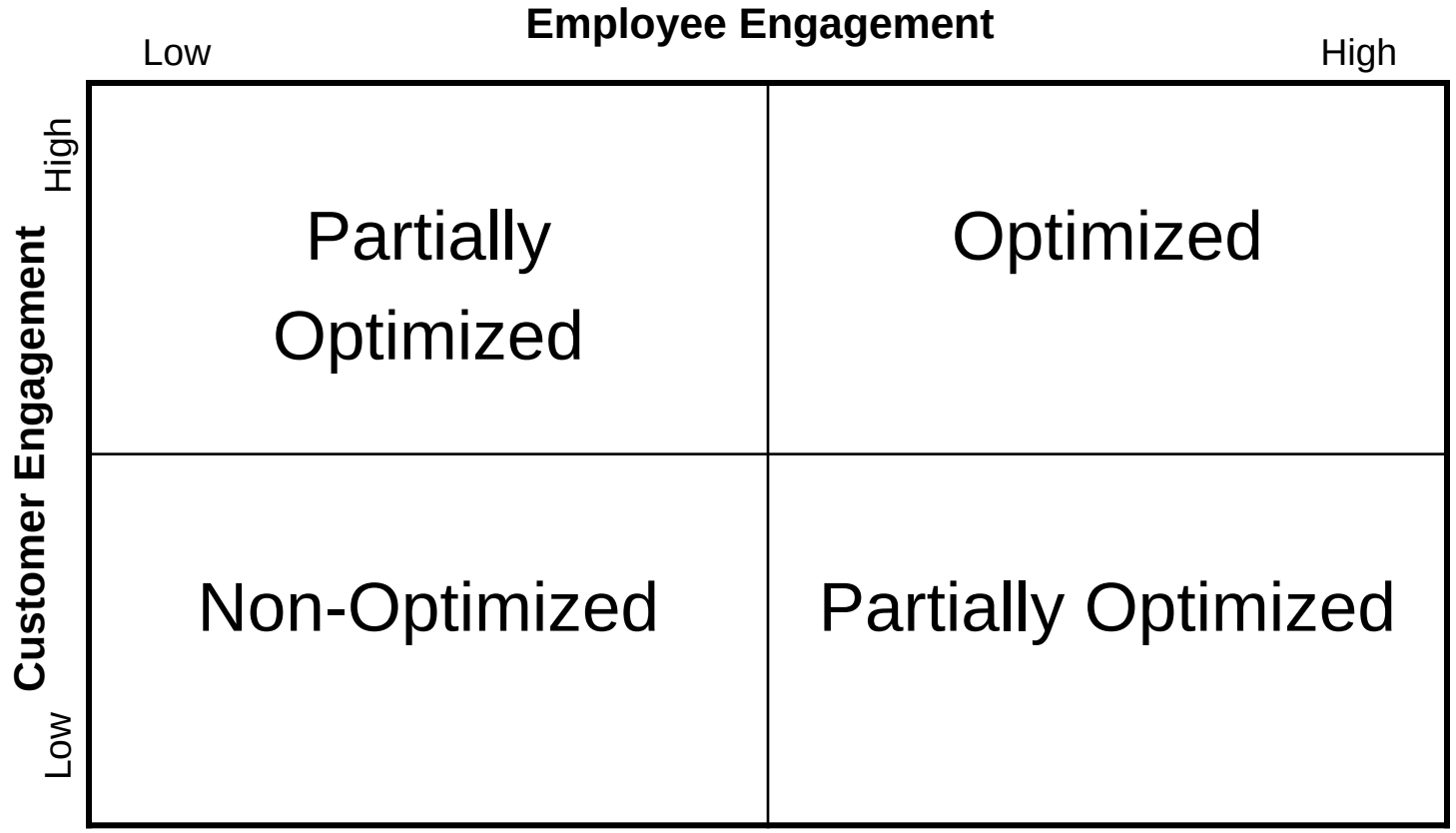
#4 Only One Number



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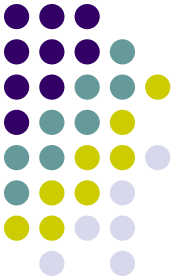
#5 Grab a Hoe



- Create a regular, ongoing measurement system.
- Communicate and Orient your staff on the measurement and it's benefits to overall performance.
- Create action plans within one month of receiving results of measurement.
- Review and coach action plans on a regular basis.
- Create a customer advisory board to delve into issues raised by survey data.
- Align your team's individual strengths with their job duties.
- Create an individualized plan for encouragement.

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Thought to consider

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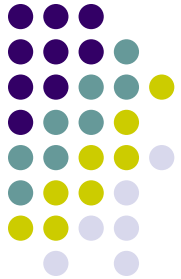
Standard PM



- Standard Steps
  - Initializing (Defining)
  - Planning (Measuring, Analyzing)
  - Executing (Implementing)
  - Controlling (Controlling)
  - Closing (Project Closure and Financials)
- Typically using a “gated” approach
  - Each gate will have a review (formal or not)
  - Each gate can decide to go on, stop, hold, change etc

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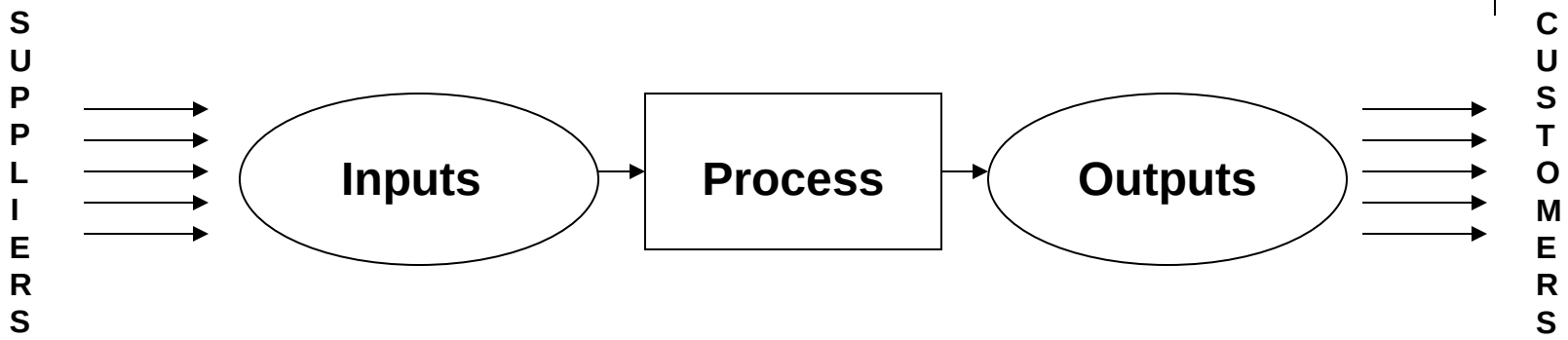
Special Guest!

SIPOC



All activity takes place in terms of a process

Having a high level view of a process helps:

- Define project boundaries (starting and ending points)
- Describe where to collect data

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SIPOC

Many people have trouble working on a SIPOC diagram in order (starting with Suppliers, moving on to Inputs, etc.). The following steps are often a more useful sequence for identifying SIPOC elements:

- Start by identifying the start and end points of the process
- Fill in the in-between steps, so you have five to seven steps total.
- Identify outputs from those steps
- Identify the customers for each output
- Identify the key inputs
- Identify the key suppliers for each input

SIPOC – Making Copies

Suppliers	Inputs	Process	Outputs	Customers
Office Supply Company	Paper	Put original on glass	Copies	You
You	Copier Setup	Close Lid		Filing Cabinet
You	Original	Adjust copier settings		Other Employees
		PressSTART		
		Remove originals and copies		

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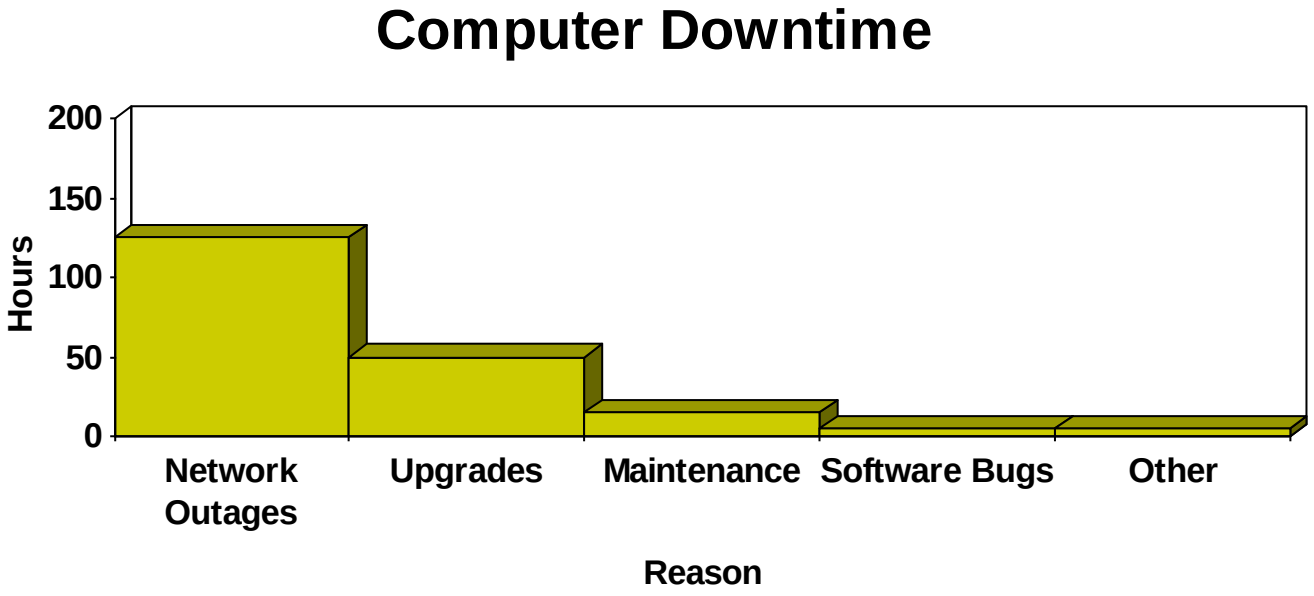
Pareto Analysis

A Pareto chart is a graphical tool that helps you break a big problem down into its parts and identify which parts are the most important.



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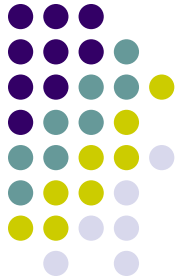
Pareto Analysis



- The Pareto principle is often described by the 80/20 rule, which states that in many situations, roughly 80% of the problems are caused by only 20% of the contributors.
- The Pareto Principle implies that we can frequently solve a problem by attacking its vital few sources.

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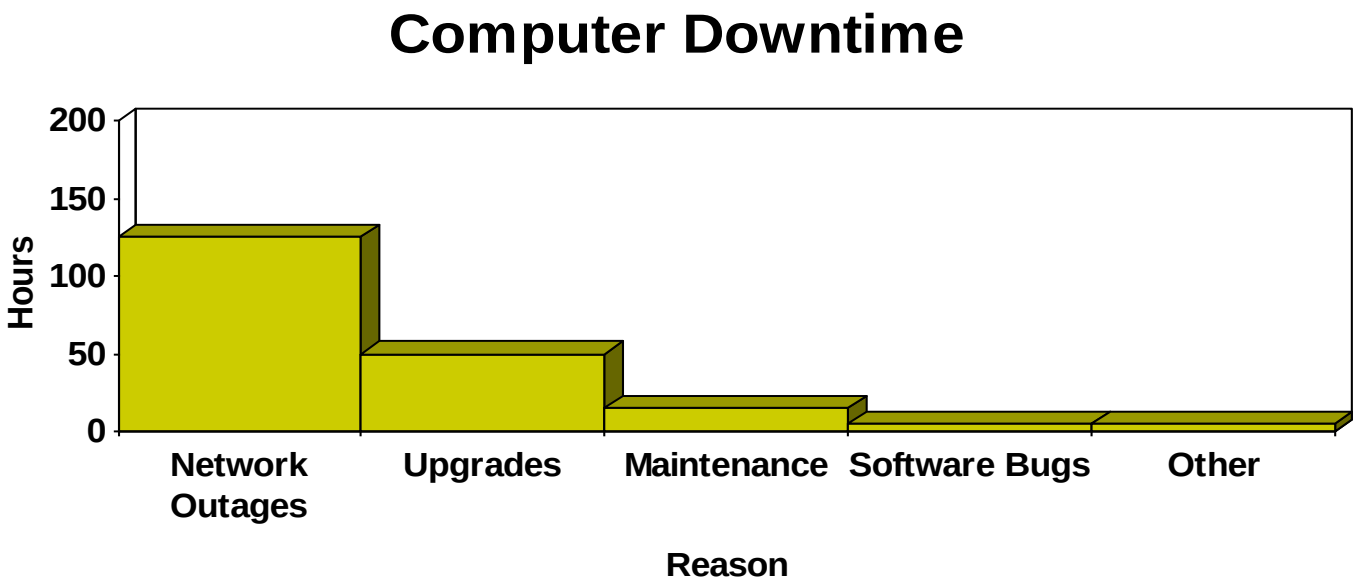
Pareto Analysis

Features:

- Used for data in categories
- Height of bar represents relative importance of that category
- Bars are arranged in descending order from left to right
- The bar for the biggest problem is always on the left
- Height of vertical axis represents sum of all occurrences



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FMEA

- Failure Modes and Effects Analysis
  - Identify ways product, service, process, project can fail
  - Estimate risk associated with failure causes
  - Prioritize the actions to reduce the risk

Exercise: