Process Improvement: Fixing Problems

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UNC
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Can’t we just fix our problems already?

Failure rates of change projects:

30-70%

What kinds of problems do you have?

- Defects
  - errors, mistakes, poor quality
- Delays
  - taking too long, timelines not being met
- Dollars
  - work costing more than we'd like

Alliterated problems from Jay Arthur, www.qimacros.com

We're going to cover a few tools to help us focus on change efforts.

Focus

- Zeroing in to target our change efforts

Change

- Strategies to identify what to do to effect improvement

- Process Behavior Charts
- Pareto Charts
- Cause and Effect
- Process Mapping

Control Charts or Process Behavior Charts

Learning to see and understand variation to improve processes

Our numbers are always changing from one period to another. What should we make of the variation?

The number of crimes is going… Up/Down?

- What are some of the reasons crime might be going up or down in our community?

Monthly Meeting of the Blue Heaven Police Stat Group Key Report

May District Crime Report

	Crimes	Percent Change from Last Month	Percent Change from Same Month Last Year	Performance Score
District 1	928	3.8%	-16.3%	0
District 2	775	-7.7%	43.3%	0
District 3	443	-6.1%	-1.1%	2
District 4	1048	12.2%	36.8%	-2

June District Crime Report

	Crimes	Percent Change from Last Month	Percent Change from Same Month Last Year	Performance Score
District 1	869	-6.4%	-30.1%	2
District 2	728	-6.1%	21.3%	0
District 3	435	-1.8%	2.1%	0
District 4	1038	-1.0%	5.7%	0

July **District Crime Report**

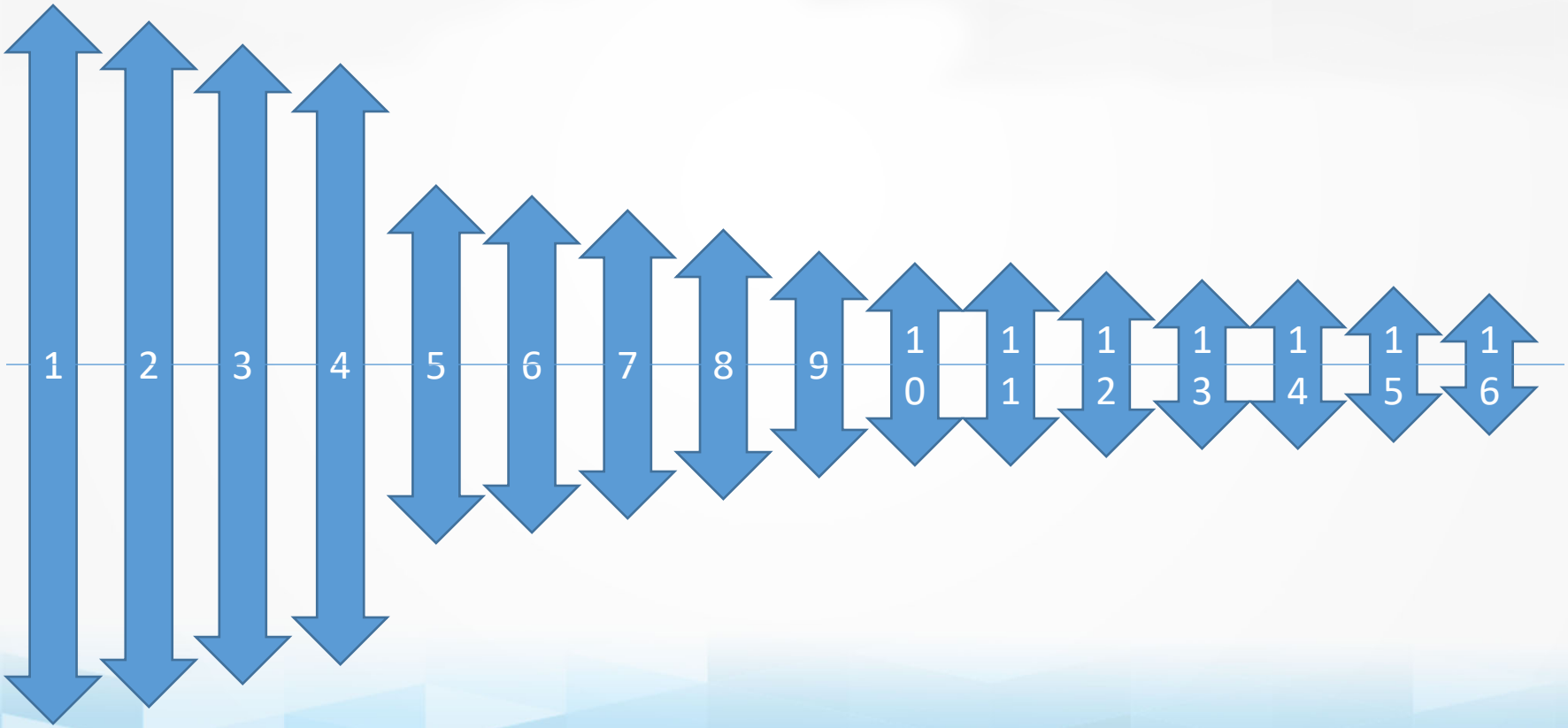
	Crimes	Percent Change from Last Month	Percent Change from Same Month Last Year	Performance Score
District 1	715	-17.7%	-36.1%	2
District 2	796	9.3%	37.5%	-2
District 3	484	11.3%	23.8%	-2
District 4	956	-7.9%	-3.7%	2

Are we confused yet?

- Who is doing a good job?
- Who's performance is down?
- What actions if any should we be taking?

- Everyone had at least one green mark and everyone had at least one red mark.

Any process or system has many causes that may be pushing performance up or down.



Assessing how we do in traditional tabular reports may lead to misunderstanding and wasted time talking about why the numbers are up or down when routine variation is present.

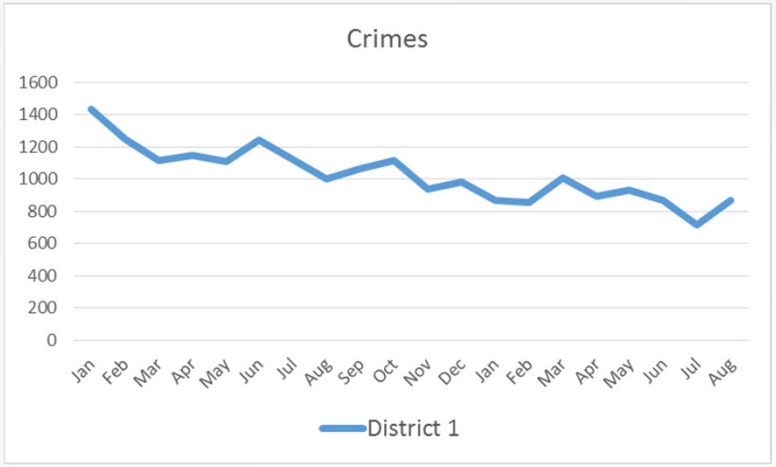
This is likely to be true whether using percentage changes, comparisons to averages, or comparisons to goals or standards.

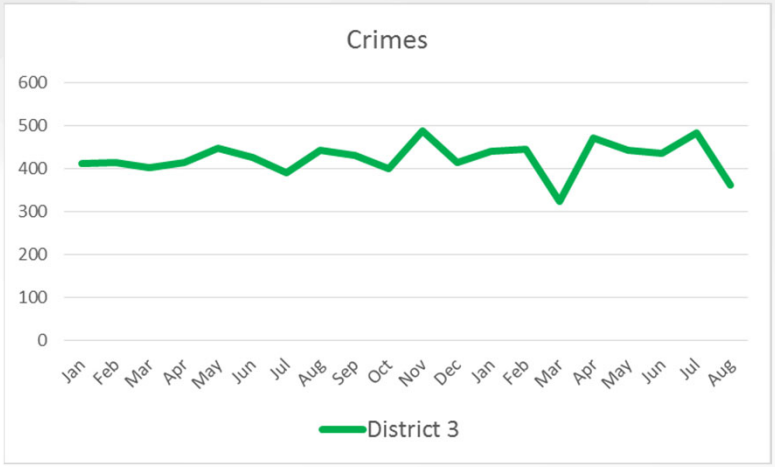
Fails to show variation in context.

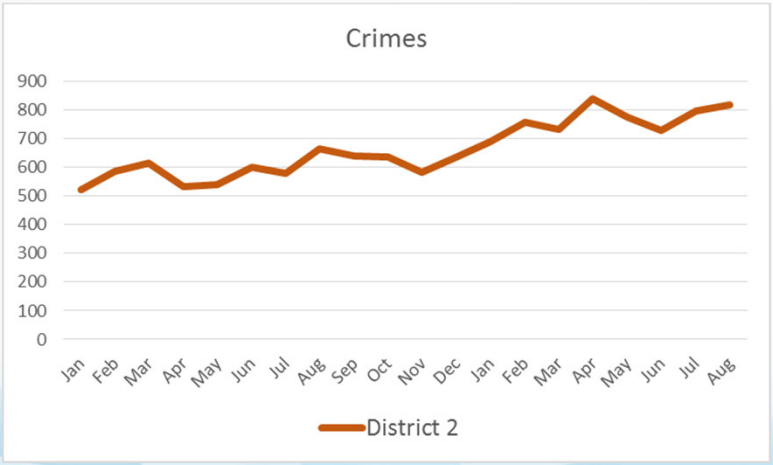
May District Crime Report

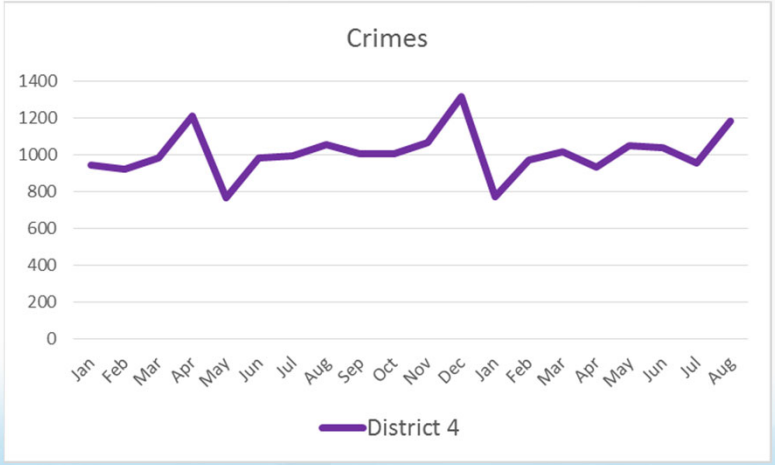
	Crimes	Percent Change from Last Month	Percent Change from Same Month Last Year	Performance Score
District 1	928	3.8%	-16.3%	0
District 2	775	-7.7%	43.3%	0
District 3	443	-6.1%	-1.1%	2
District 4	1048	12.2%	36.8%	-2

Is the picture any clearer with simple line graphs?









- Plotting the dots is the first step to
  - better understanding,
  - better analysis,
  - better discussions about performance, and
  - better decisions about where action is needed and where it may not be.

May **District Crime Report**

	Crimes	Percent Change from Last Month	Percent Change from Same Month Last Year	Performance Score
District 1	928	3.8%	-16.3%	0
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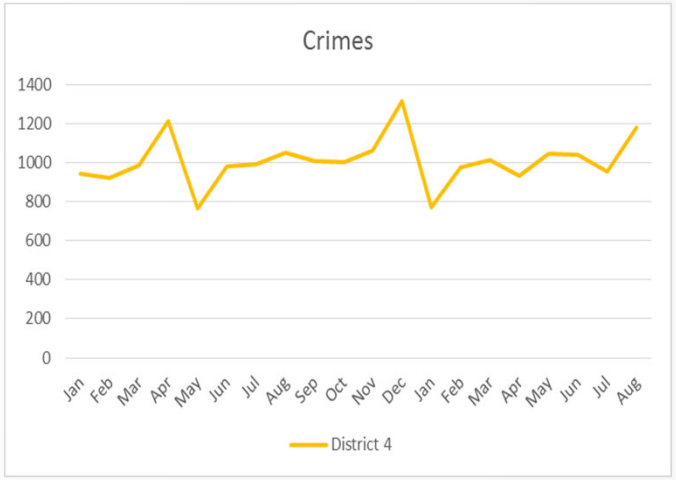
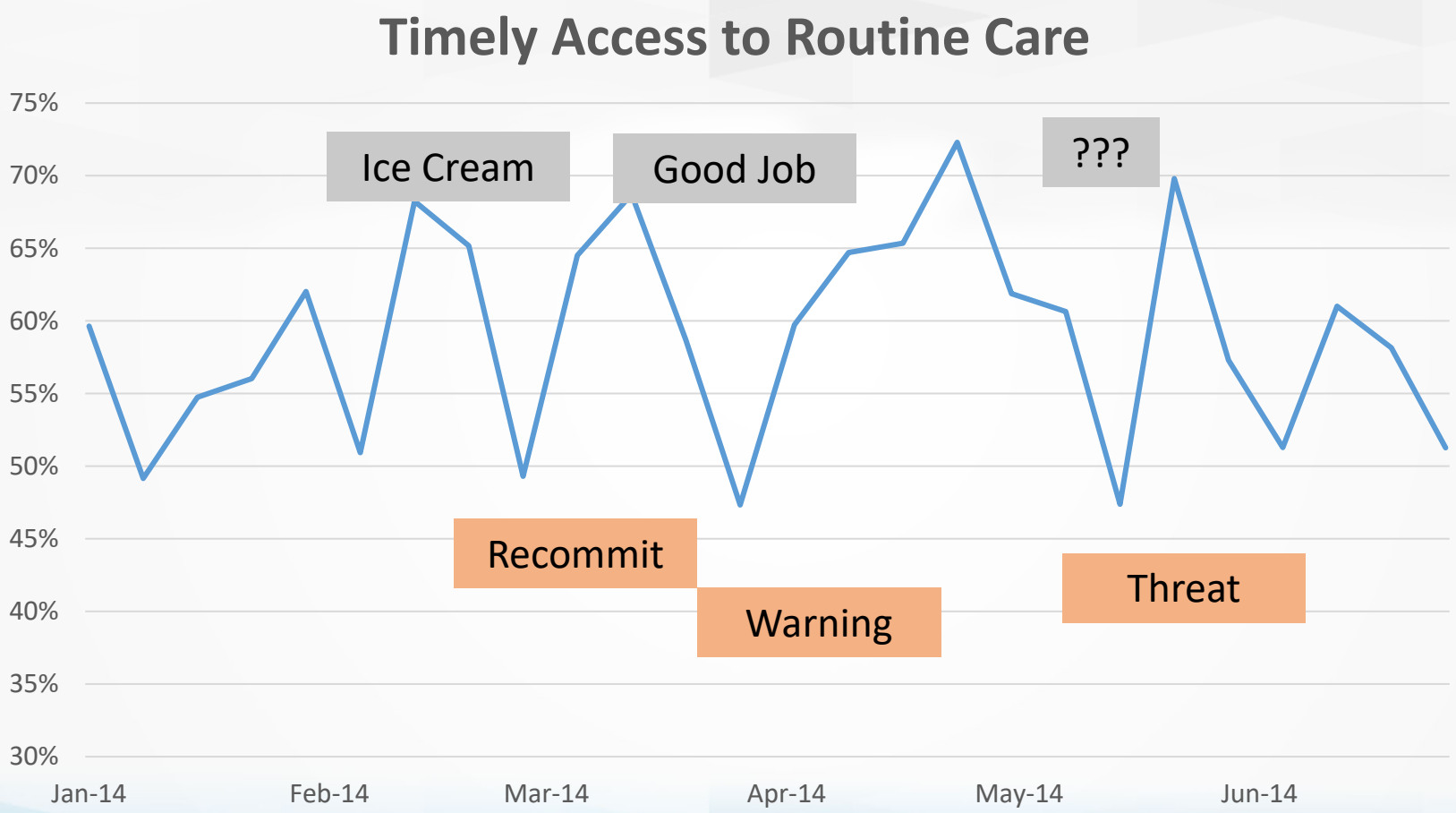
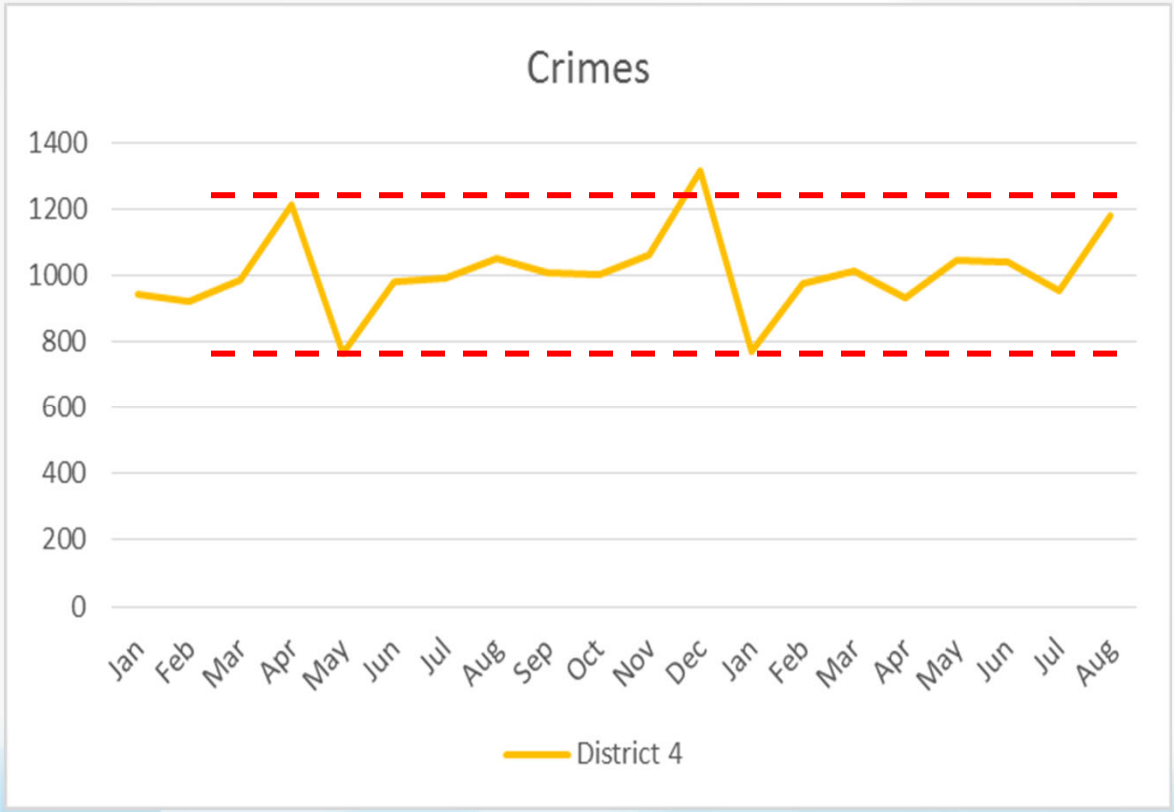


What does management see as we progress through time?



A step up from simple line charts is a process behavior or control chart.

Control charts seek to break variation in to common or routine variation that is part of the process and special cause that is exceptional variation that is likely some signal of change.



Special Cause

Common cause

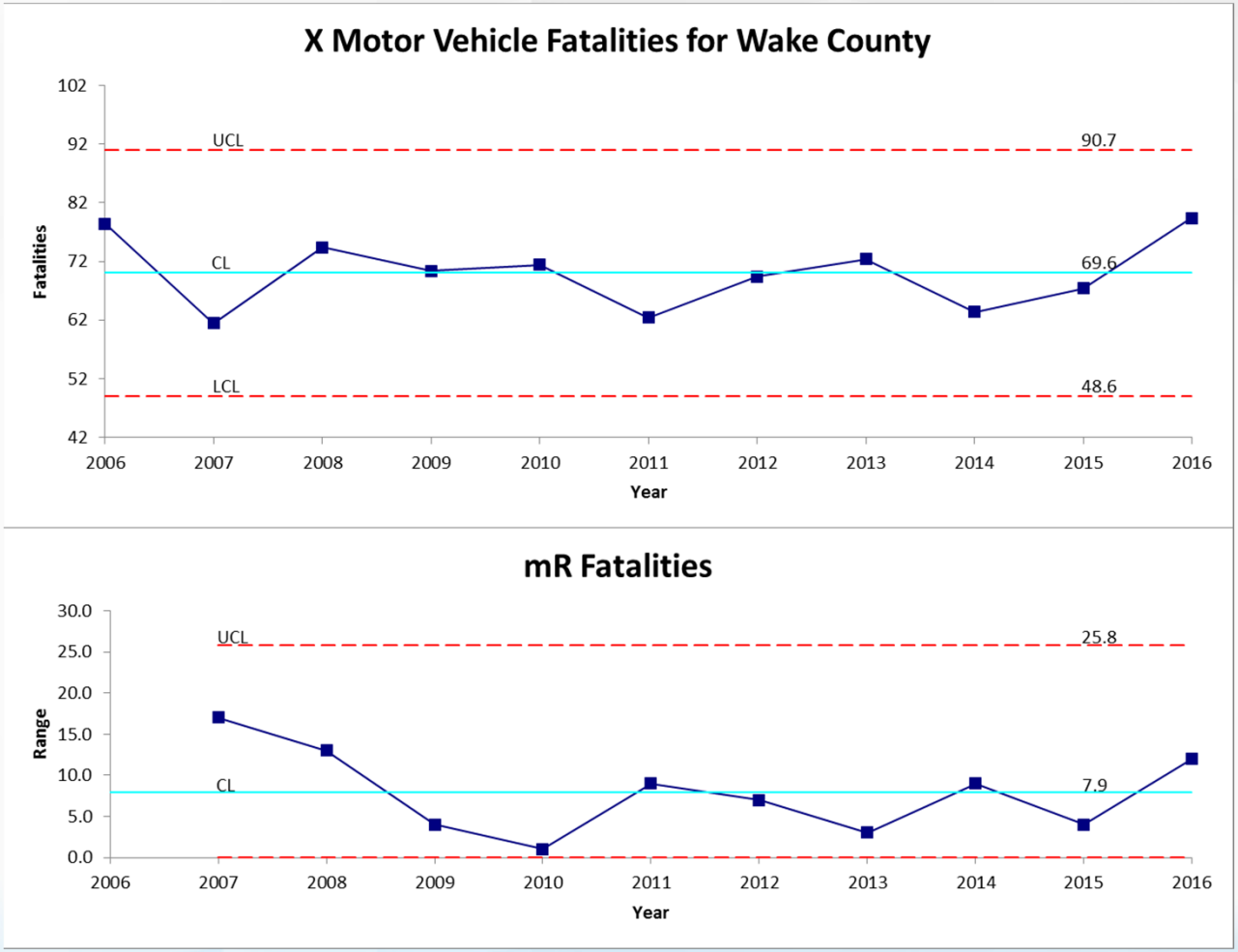
Special Cause

What do you do with this headline?

- *Wake County Motor Vehicle Fatalities up from 67 in 2015 to 79 in 2016, 18% increase!*
- *NC Fatalities up by just 4% over same period.*
- *Data Source: North Carolina 2016 Traffic Crash Facts, NC Division of Motor Vehicles*

Actual data, no such headline to my knowledge

The control chart for motor vehicle fatalities in Wake County doesn't suggest the process has changed.



Should we be celebrating progress with this headline?

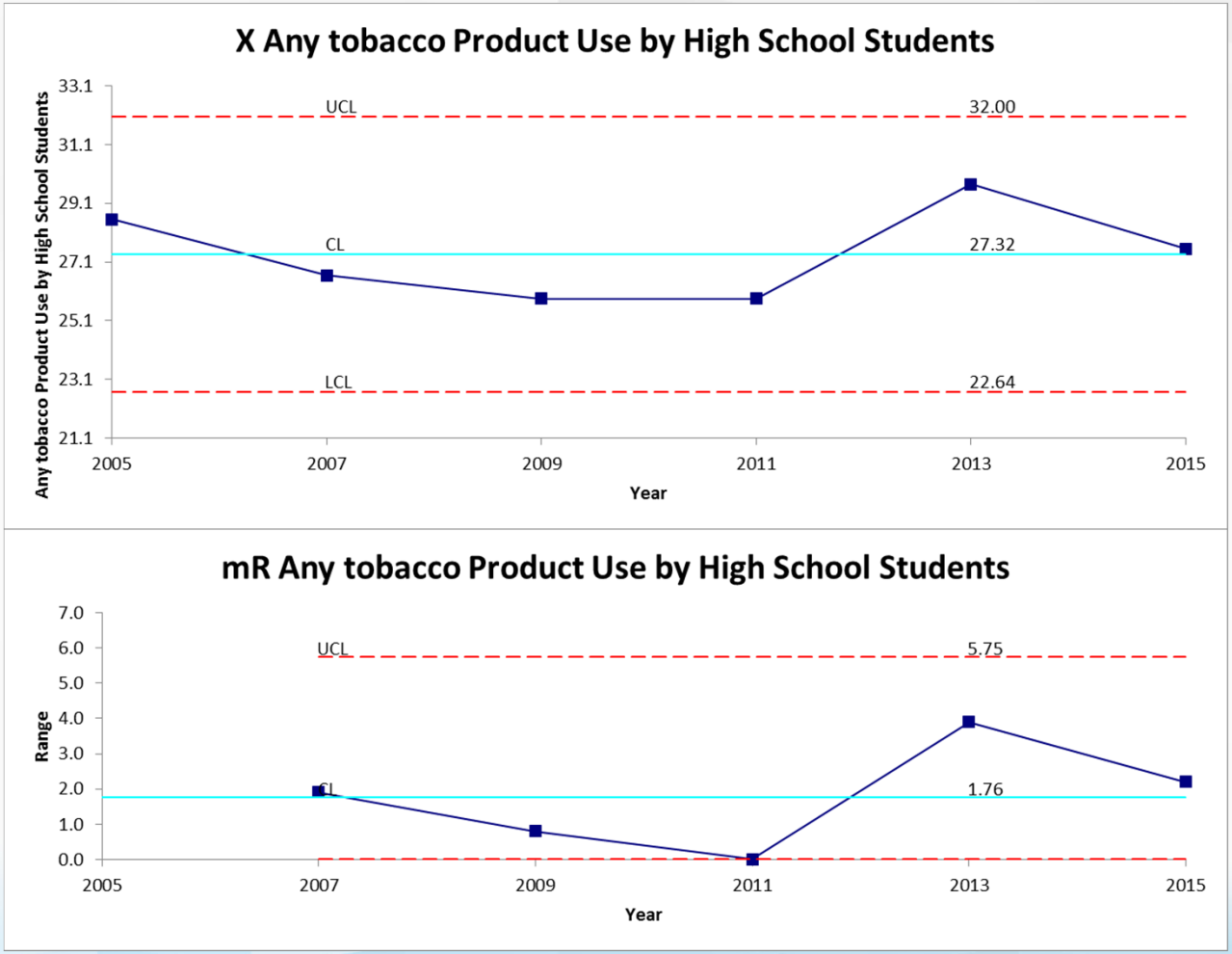
Greensboro News and Record

Use of Tobacco Products Down by NC High School Students

- *Survey data shows use of any type of tobacco products by NC high school students was down from 29.7 percent of students in 2013 to 27.5 percent in 2015.*
- *Data Source: N*ORTH CAROLINA YOUTH TOBACCO SURVEY (NC YTS) for Middle & High Schools Factsheet, NC Division of Public Health

Actual data, no such headline to my knowledge

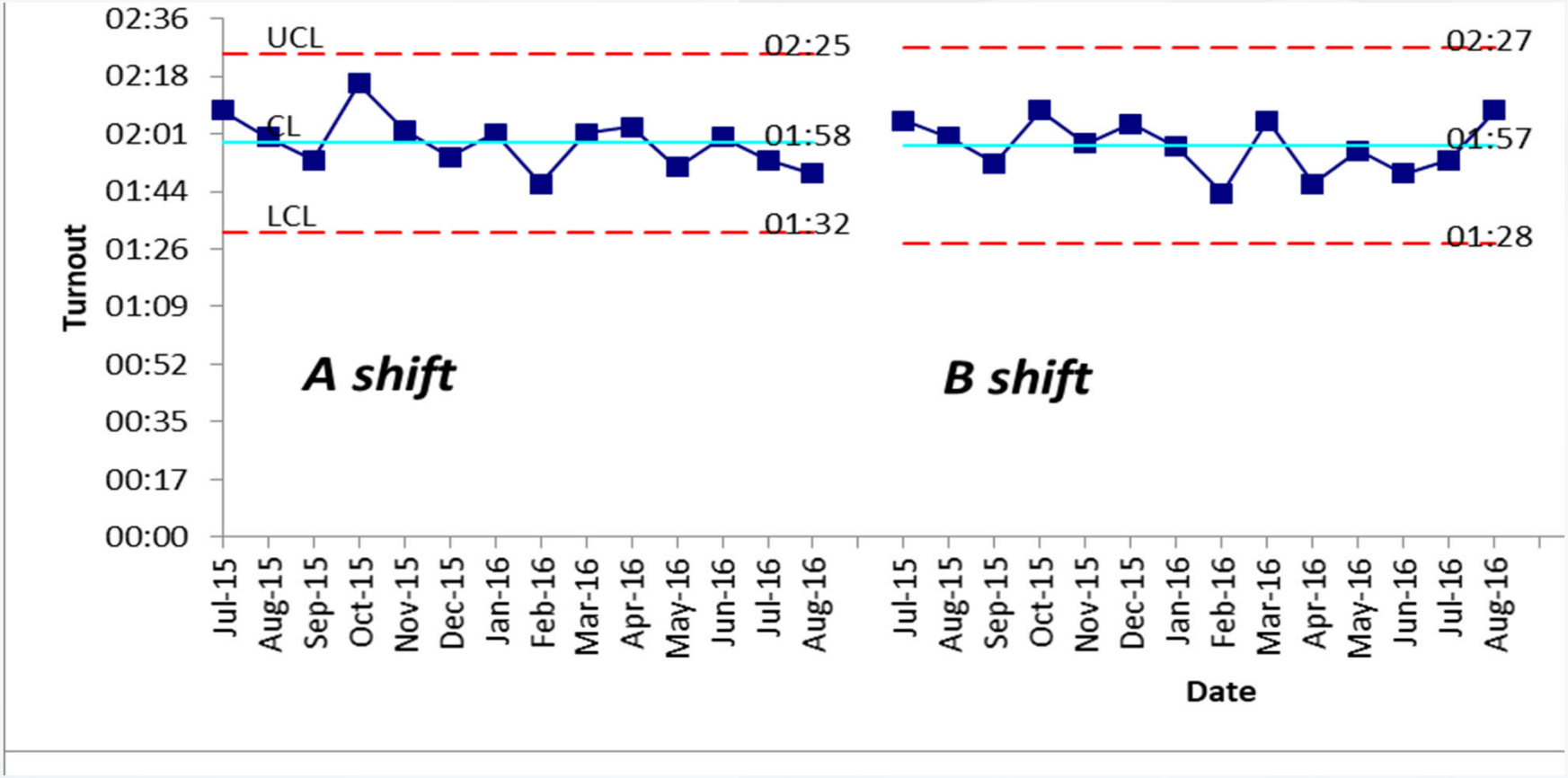
The control chart for tobacco use shows that the decline in the most recent year while positive doesn't suggest the process has changed.



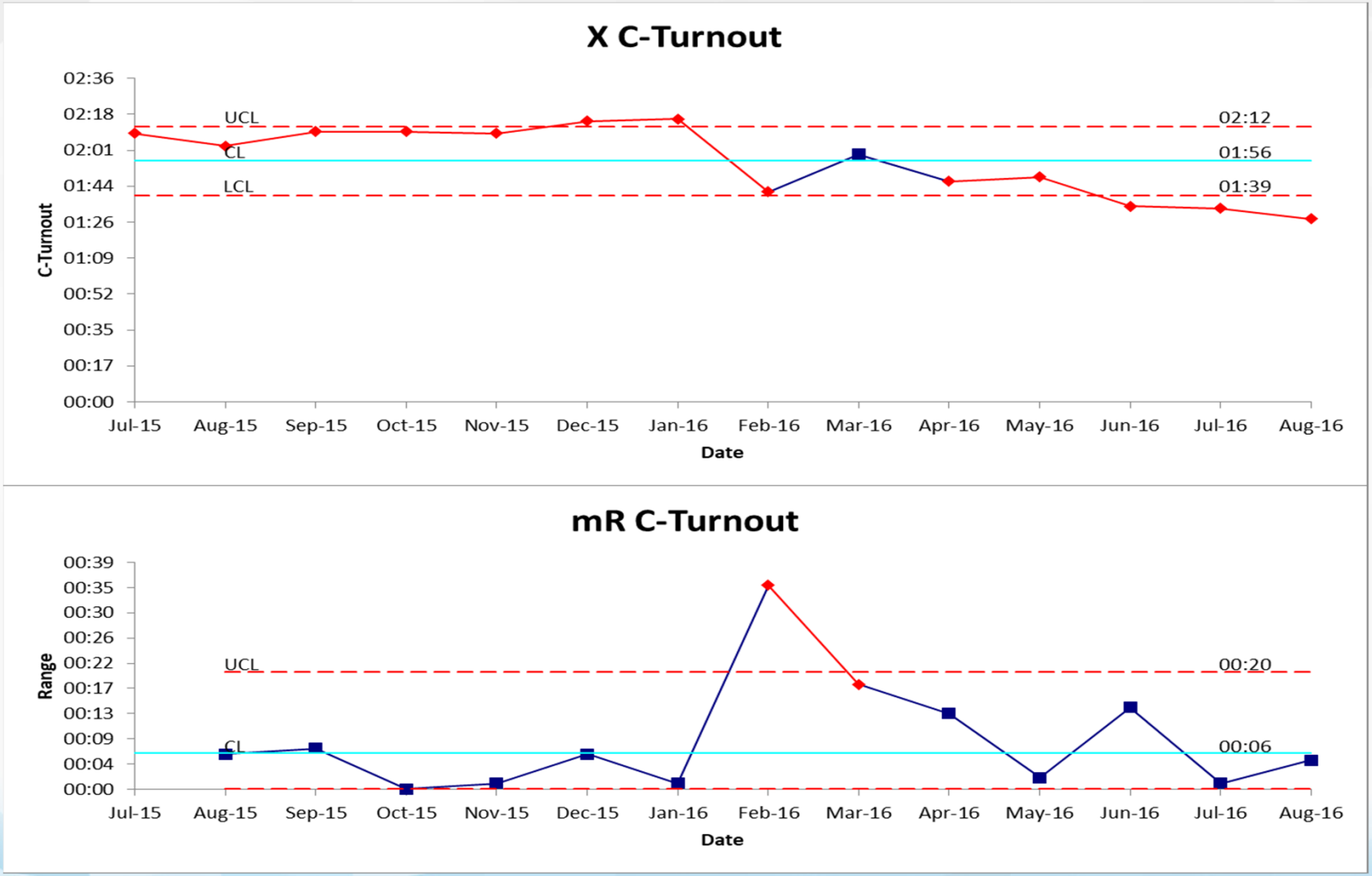
Turnout Times for Fire Station

Engine Company 1	Shift		
Date	A-Turnout	B-Turnout	C-Turnout
Jul-15	02:08	02:05	02:09
Aug-15	02:00	02:00	02:03
Sep-15	01:53	01:52	02:10
Oct-15	02:16	02:08	02:10
Nov-15	02:02	01:58	02:09
Dec-15	01:54	02:04	02:15
Jan-16	02:01	01:57	02:16
Feb-16	01:46	01:43	01:41
Mar-16	02:01	02:05	01:59
Apr-16	02:03	01:46	01:46
May-16	01:51	01:56	01:48
Jun-16	02:00	01:49	01:34
Jul-16	01:53	01:53	01:33
Aug-16	01:49	02:08	01:28

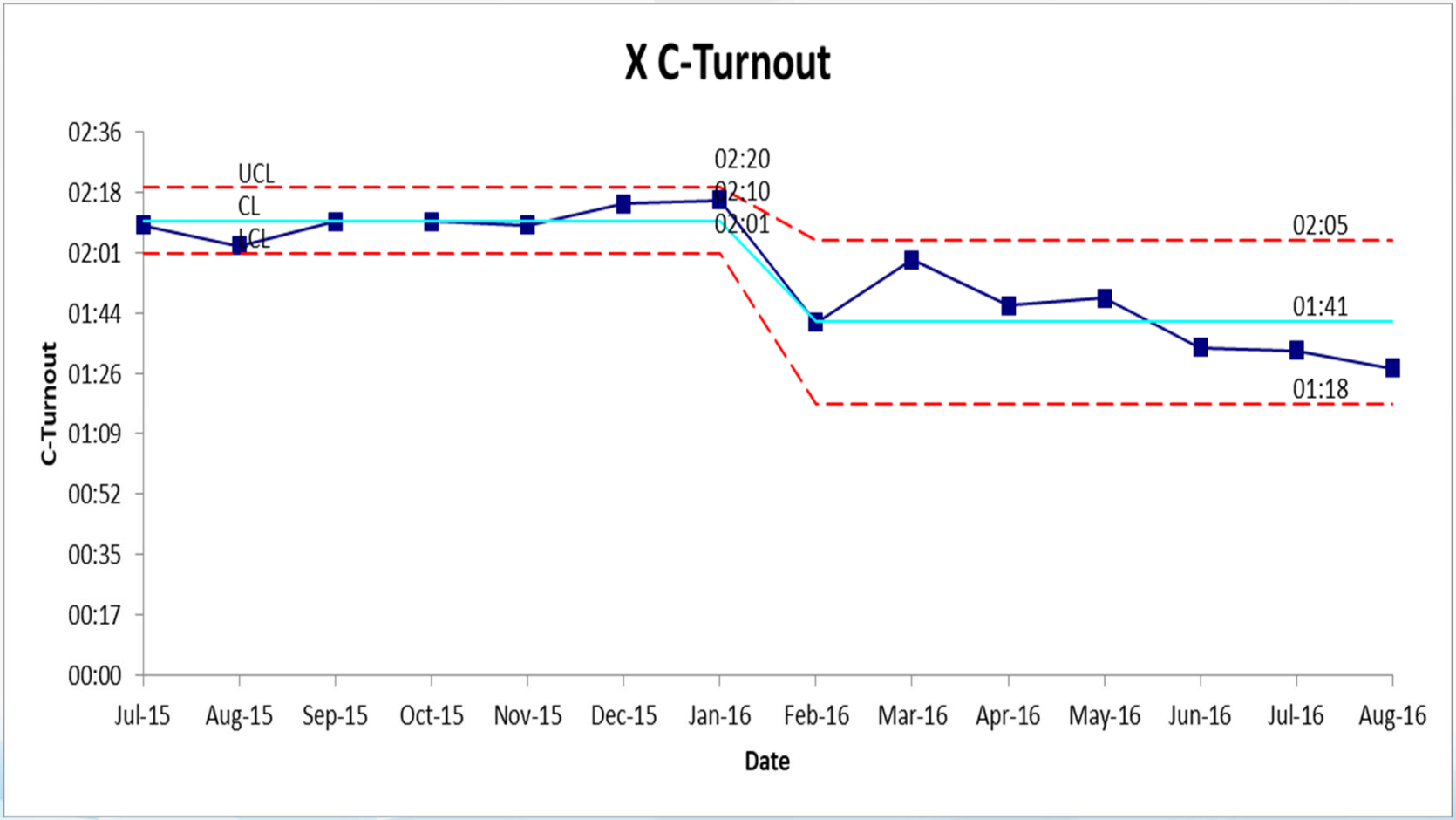
Turnouts for A and B shifts are almost identifcal

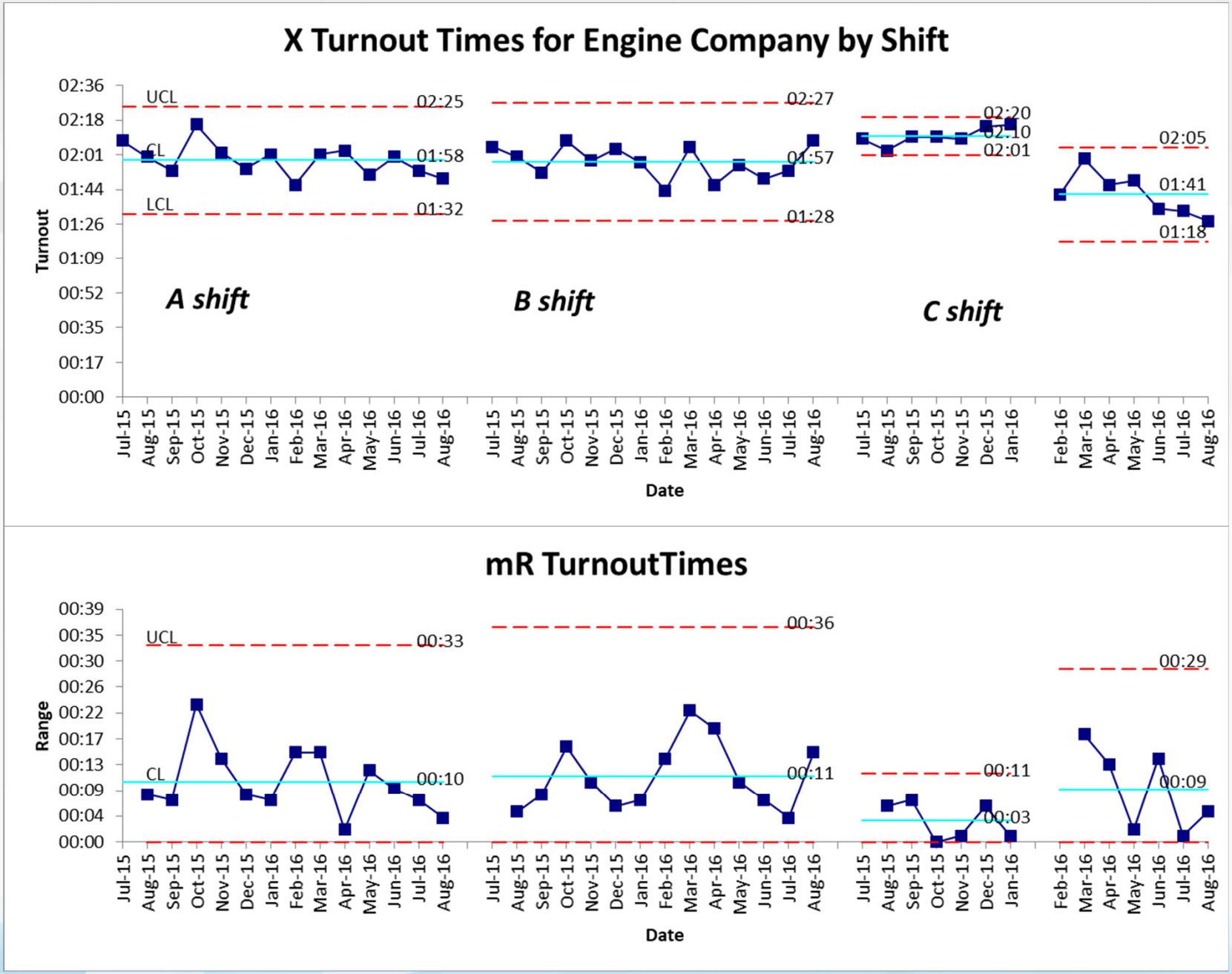


The C-shift times show process change.



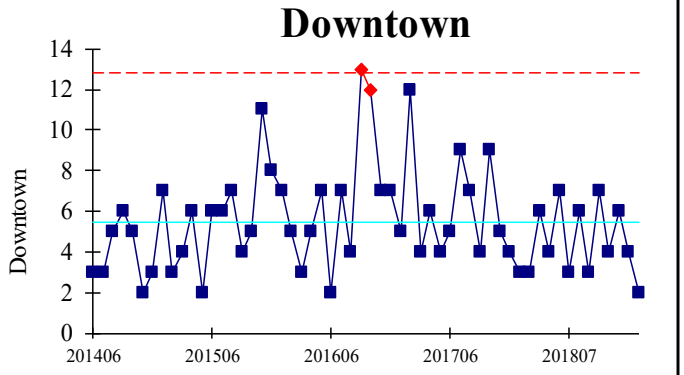
If we make an adjustment, we can see the new process is lower with a wider range and may yet move even lower.

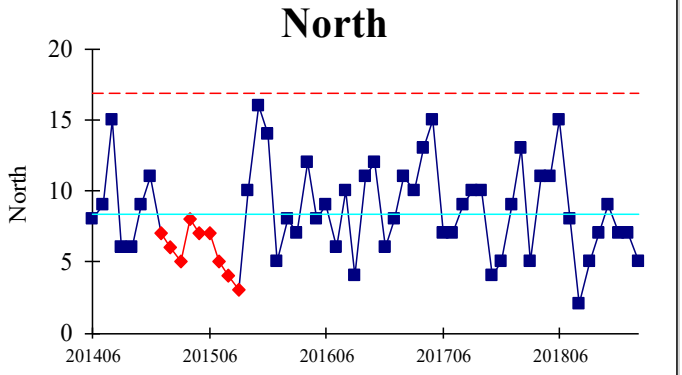


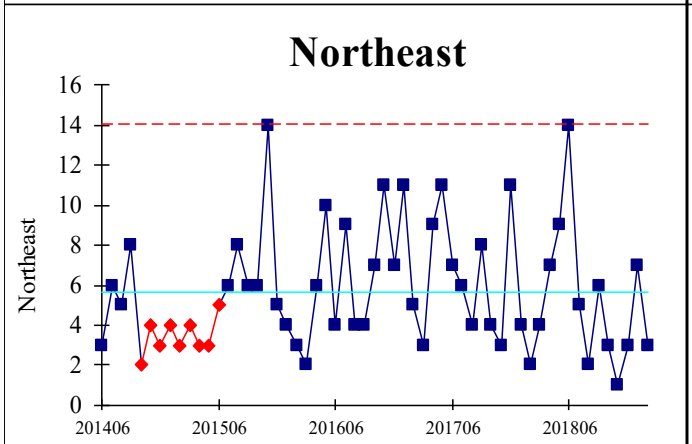

X Turnout Times for Engine Company by Shift
Turnout
02:36
02:18
02:01
01:44
01:26
01:09
00:52
00:35
00:17
00:00
UCL
CL
LCL
02:25
01:58
01:32
02:27
01:57
01:28
02:20
02:10
02:01
02:05
01:41
01:18
A shift
B shift
C shift
Jul-15
Aug-15
Sep-15
Oct-15
Nov-15
Dec-15
Jan-16
Feb-16
Mar-16
Apr-16
May-16
Jun-16
Jul-16
Aug-16
Date
mR TurnoutTimes
Range
00:39
00:35
00:30
00:26
00:22
00:17
00:13
00:09
00:04
00:00
UCL
CL
00:33
00:10
00:36
00:11
00:11
00:03
00:29
00:09
Date

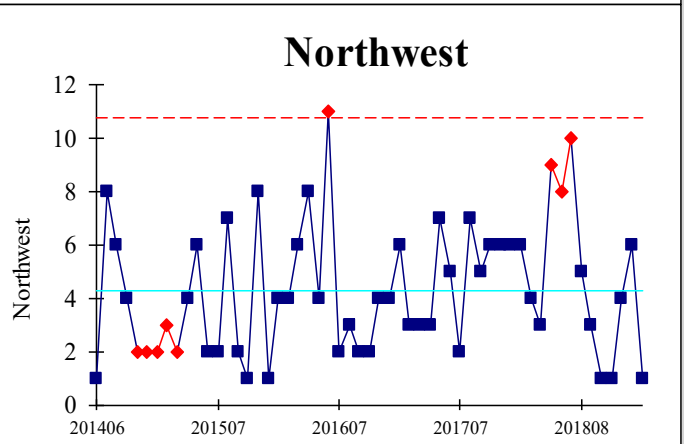
Control Chart Dashboard for Commercial Burglaries in Raleigh

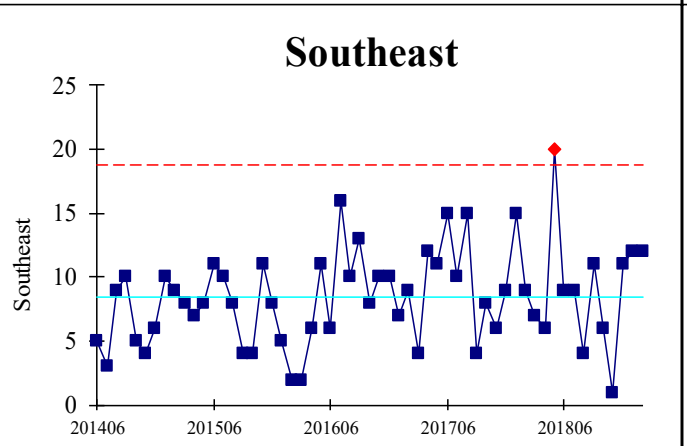
Burglary/Commercial Based on Raleigh Open NBIRS Data Reported by Month for June 2014 to February 20, 2019

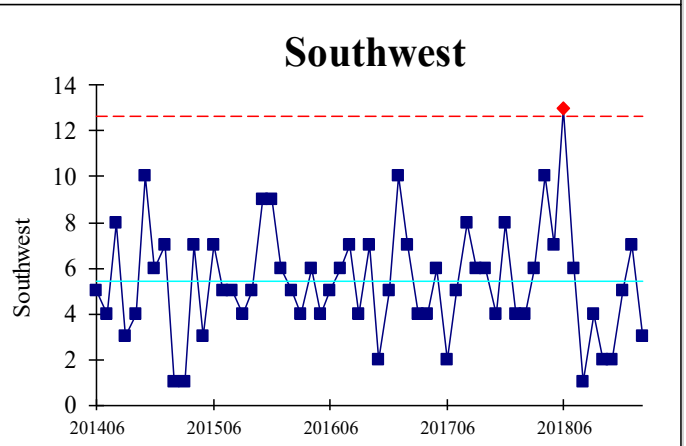












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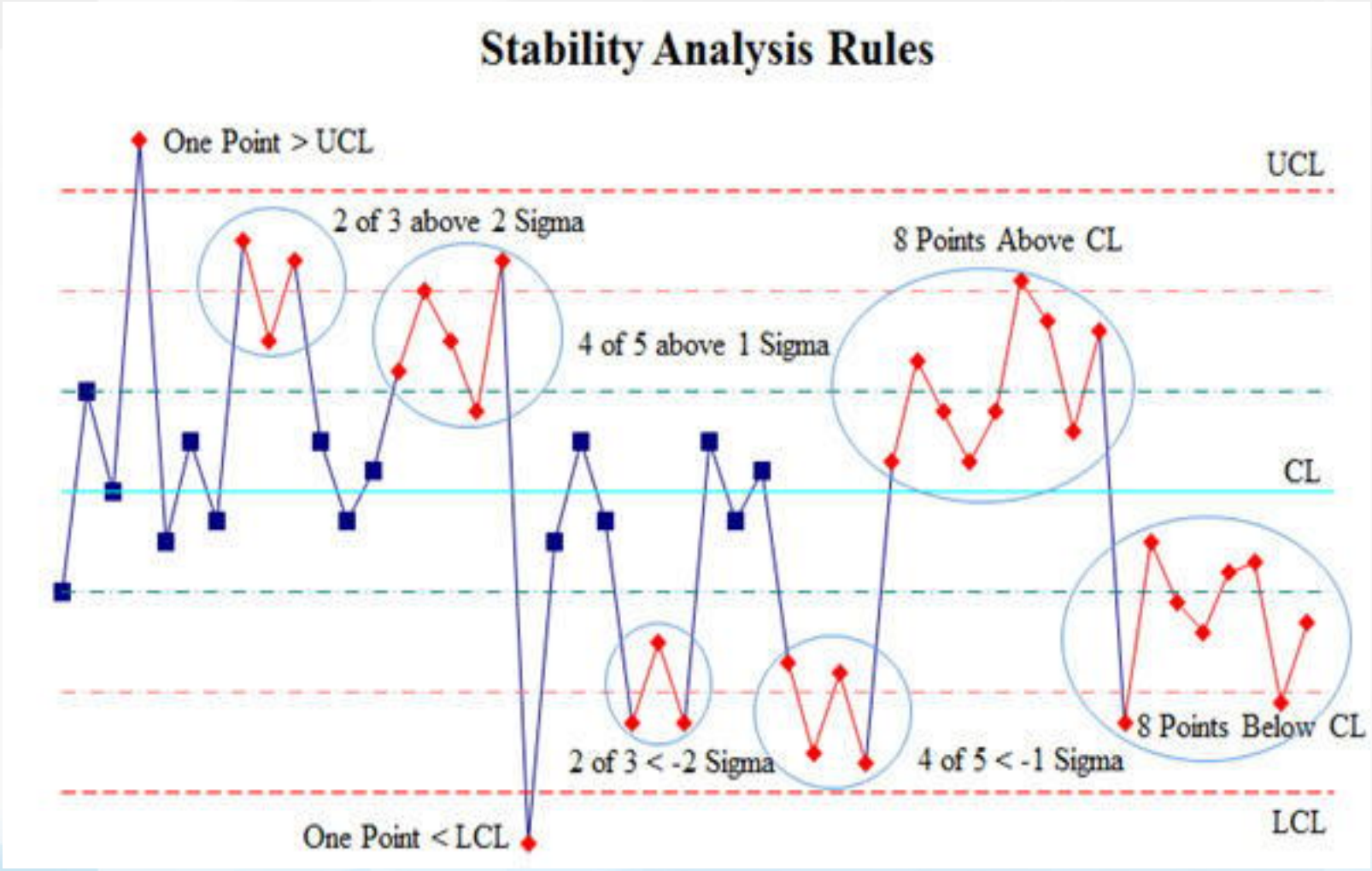
The four most common rules pointing to processes with special cause variation.



www.qimacros.com

XmR or ImR – The Swiss Army Knife of Process Behavior Charts

- It is the best chart for management and service processes.
- It is based on empirical data whereas some other models assume reliance on particular probability models.
- It is robust and will work in most situations. It is flexible and sensitive to actual change.

If you go forward with this technique, you may want to shift your terminology to better represent and communicate what you are doing.

Traditional	Better terminology
Control Chart	Process behavior chart
In-control process	Predictable process
Out-of-control process	Unpredictable process
Control limits	Natural process limit
Statistical process control	Continual improvement

If you intend to search for additional information in books or online, the terms on the left are the traditional phrasing. However, the terms on the right are likely to carry less baggage (for example the word “control”).

Suggested by Donald Wheeler http://www.spcpress.com/pdf/DJW129.pdf

Process behavior or control charts can be used in several ways.

- What does our variation look like, what is average, and what is the predictable range.
- Provide guidance about when to react to variation and when to not react.
- Better discussions about what the varying numbers are telling us.
- Test new experiments or assess whether process changes have made a difference.
- Monitor process over time.

If you want to push past just line charts, see the extra handout on understanding variation with resources and explanation.

You can also download the example Excel file to create basic control charts.

Pareto Analysis

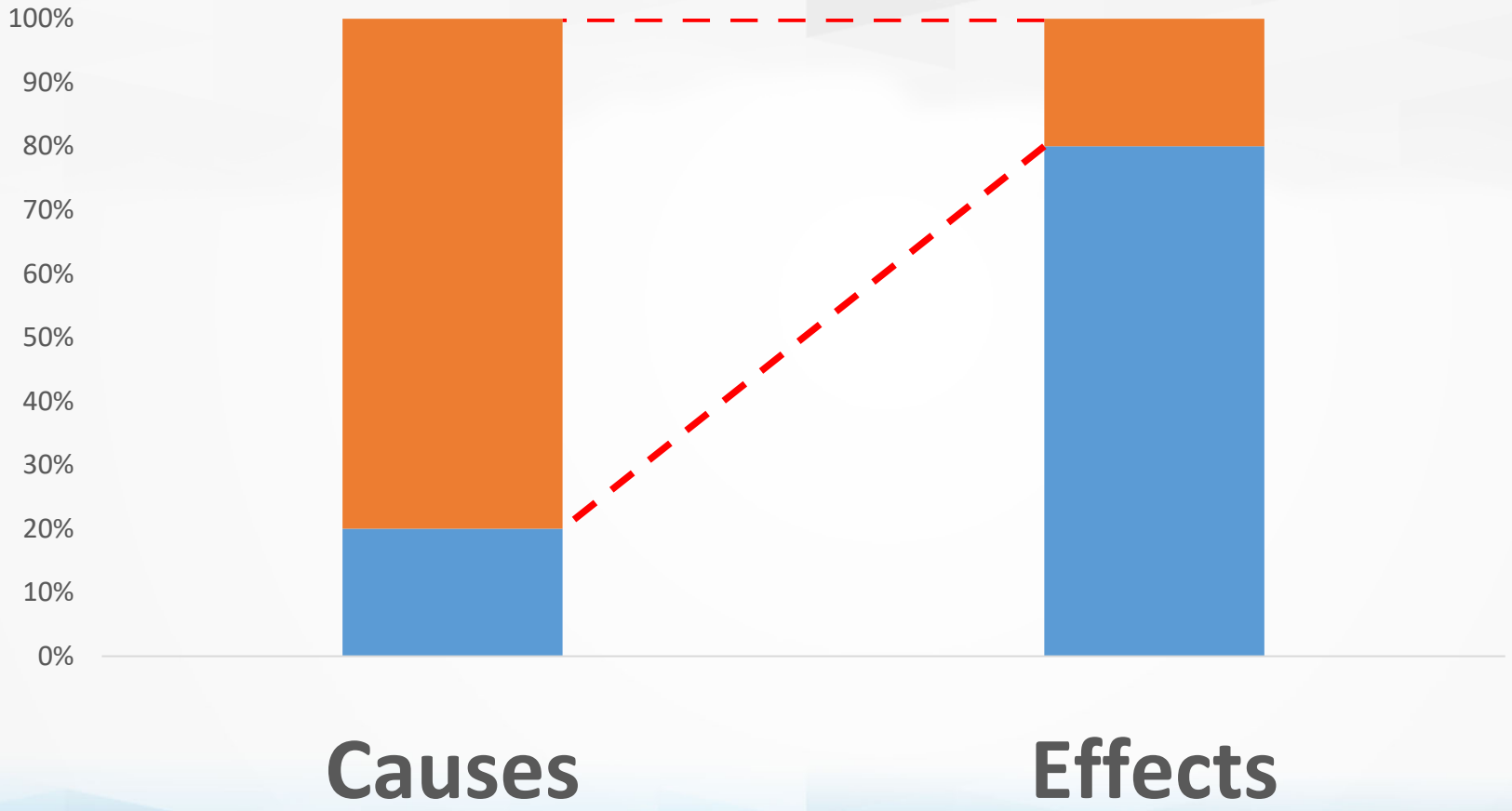
Looking for the vital few causes of our problems

If we believe we have a performance problem, what do we do?

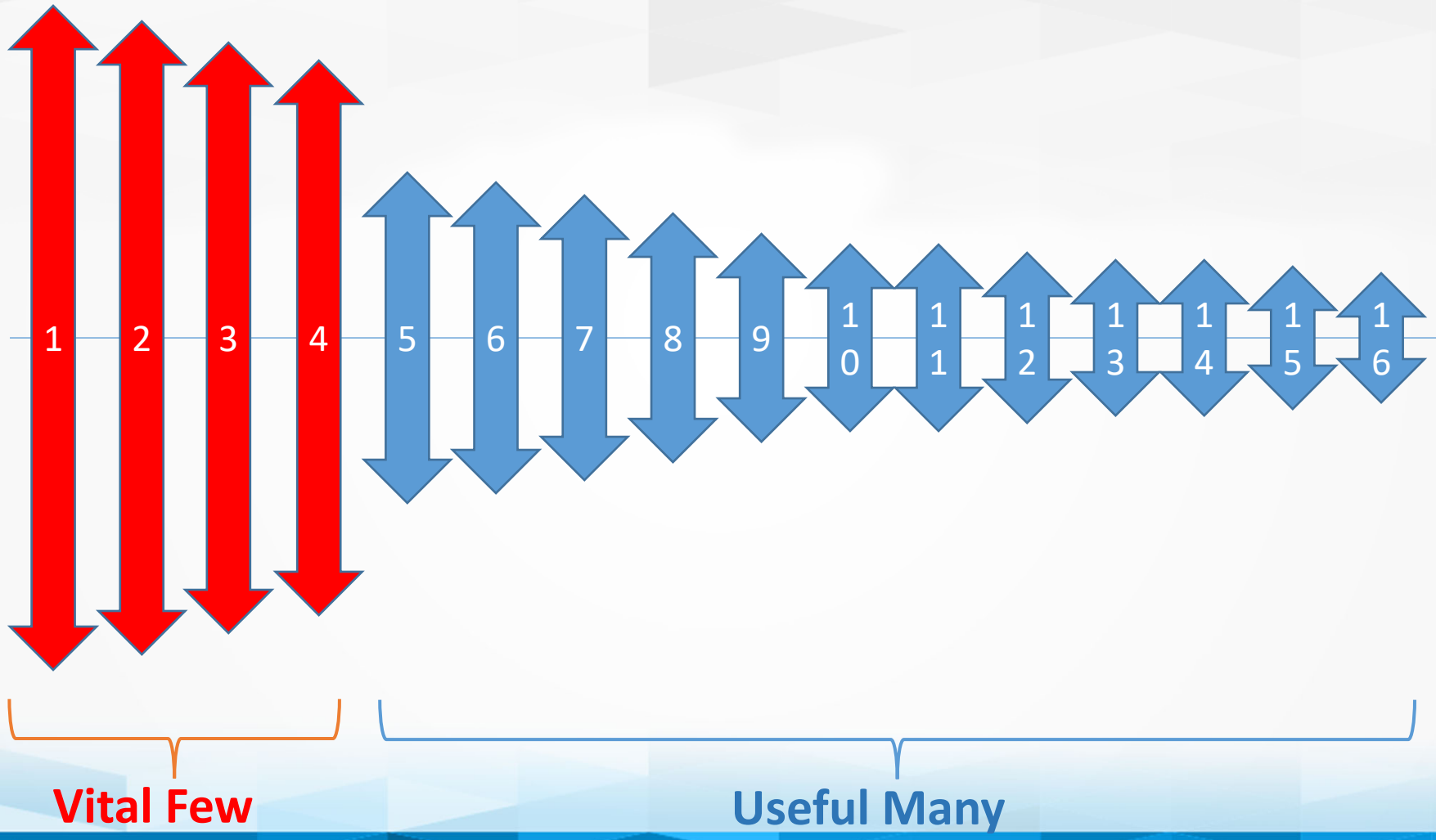
- *We can't do nothing*
- *We can't fix everything*
- *We want to make a difference*

The Pareto Principle or 80/20 Rule is a simple analytical technique to help us focus on actions that are most likely to make a difference.

A small fraction of items will produce a large fraction of effects.



Focus on the vital few that are the biggest cause of problems.



Possible examples of the Pareto Principle in government.

- A large portion of crime is committed by a small number of people.
- Most of the financial issues come from a small number of bills or payors.
- Most of the breaks in a water system will come from a small portion of the system.
- Most of our service costs are for a small number of clients.

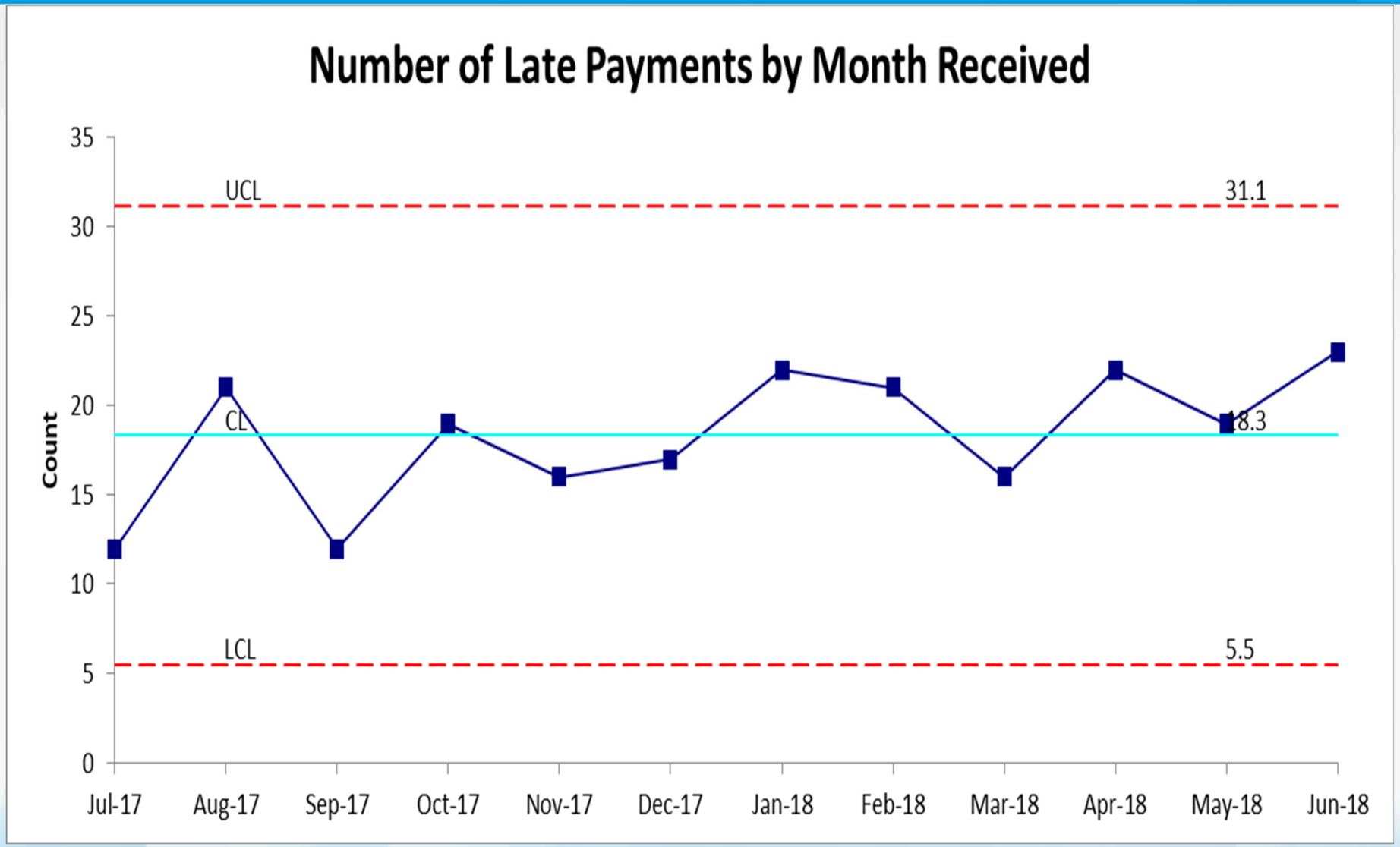
What do you do when you have data?

- Slice and dice data by subcategories
  - Time
  - Cause Type
  - Geography
  - Organizational Unit
  - Other?
- Look at data by different measures of effect.
  - Cases/Incidents
  - Dollars
  - Severity

The case of the *Late Payables*

- Vendors providing services and products to the City of Dogwood Acres have been complaining about how long it takes the city to pay its bills. They are threatening to drop the city as a client.
- Some of these payments are taking over three months to pay after receipt.
- Finance Director William Overdue says “my staff is working hard but we haven’t made progress in bringing down how long it takes. We’ve tried different ideas but no success so far. Maybe I need more staff.”
- ***What could we do to help Mr. Overdue fix this problem?***

The number of late payments per month doesn't show a clear trend, averaging about 18 late bills per month.



Vague problem statements risk producing vague results.

- Take a systems or big picture view. What can we do to help focus the effort to fix the problem and improve the late payments?

- Slice and dice the data to drill down.

- *What factors might we look at to help Dogwood Acres focus their improvement efforts?*

Use your data and summarize it by different cuts to find useful insights.

Go from raw data to meaningful output using pivot tables

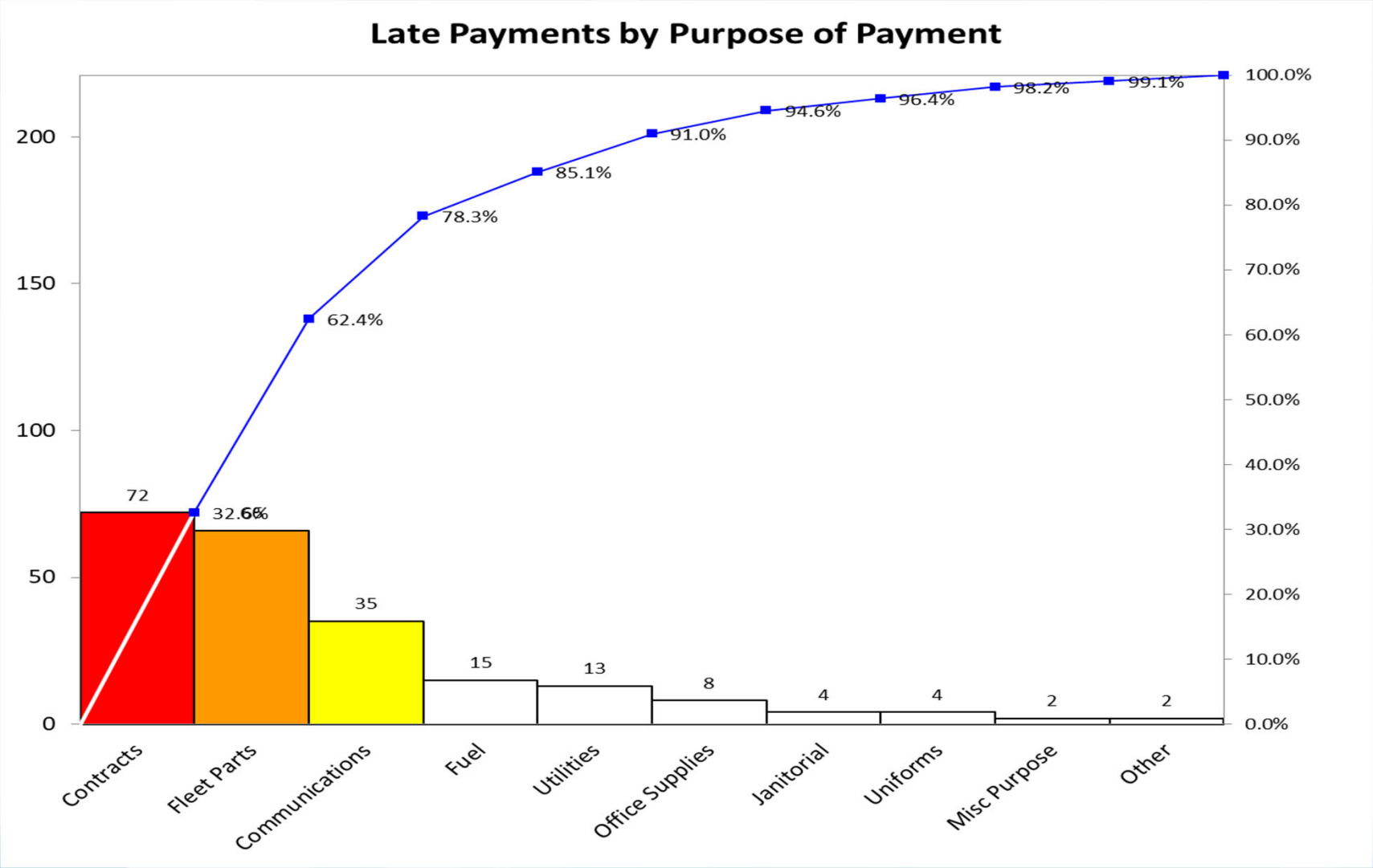
Accounts Payables

Accounts Payable that took longer than 30 days to pay.

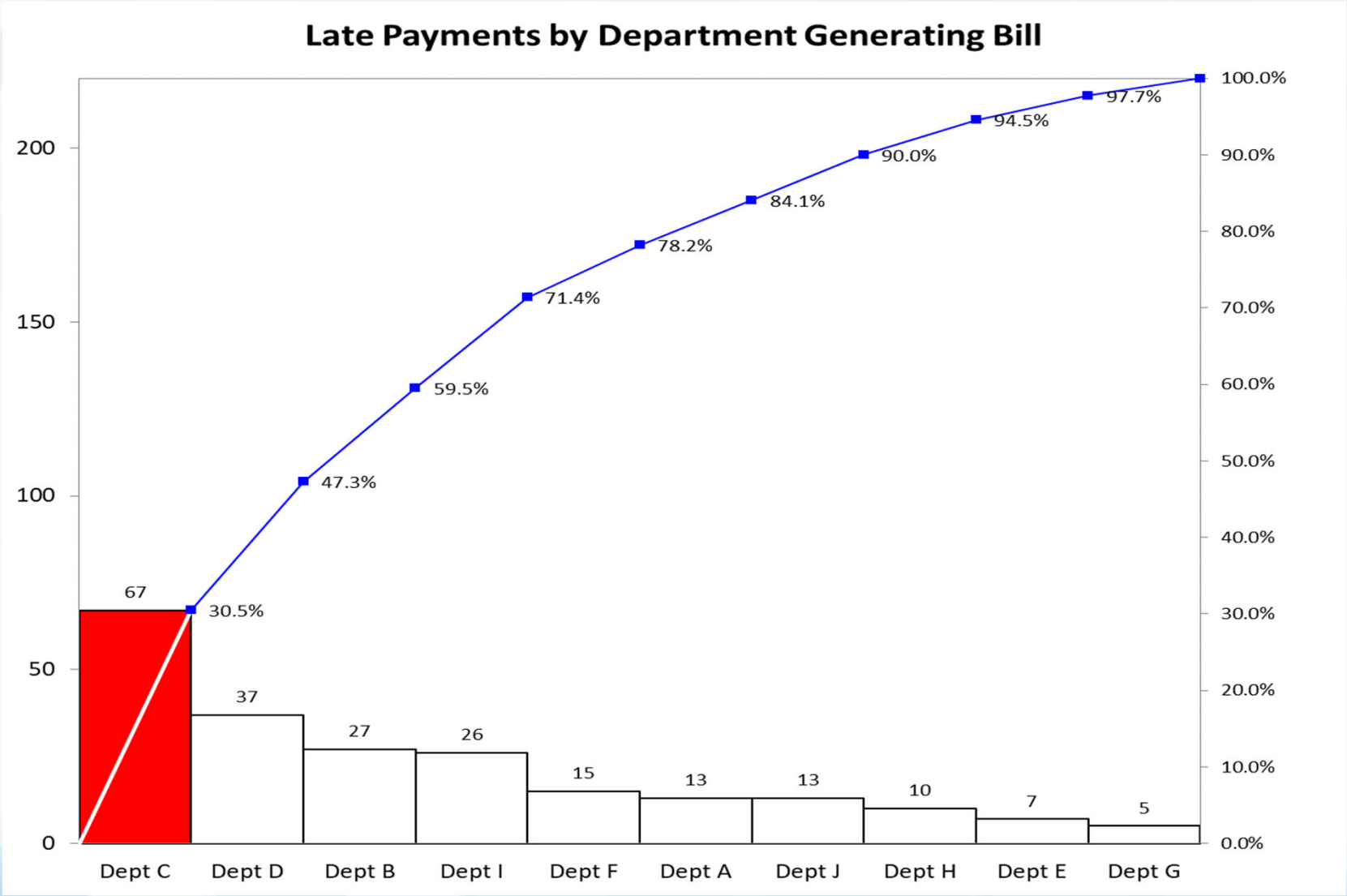
Invoice	Date Received	Date Paid	Days to Pay	Department	Purpose	Amount
1707169	7/16/2017	10/2/2017	78	Dept C	Fleet Parts	$ 447
1707176	7/17/2017	9/20/2017	65	Dept D	Contracts	$ 1,256
1707184	7/18/2017	10/16/2017	90	Dept A	Utilities	$ 1,335
1707195	7/19/2017	9/23/2017	66	Dept C	Fleet Parts	$ 798
1707199	7/19/2017	9/13/2017	56	Dept I	Contracts	$ 1,071
1707202	7/20/2017	10/15/2017	87	Dept D	Contracts	$ 1,377
1707245	7/24/2017	10/12/2017	80	Dept F	Contracts	$ 1,190
1707267	7/26/2017	10/18/2017	84	Dept I	Janitorial	$ 626
1707304	7/30/2017	10/16/2017	78	Dept D	Communications	$ 1,081
1707305	7/30/2017	10/28/2017	90	Dept D	Contracts	$ 1,164
1707308	7/30/2017	10/8/2017	70	Dept C	Fleet Parts	$ 423
1707315	7/31/2017	9/26/2017	57	Dept B	Contracts	$ 1,260
1708016	8/1/2017	11/7/2017	98	Dept C	Fleet Parts	$ 871
1708033	8/3/2017	10/12/2017	70	Dept I	Contracts	$ 1,029
1708047	8/4/2017	9/19/2017	46	Dept J	Fleet Parts	$ 775
1708079	8/7/2017	10/13/2017	67	Dept I	Contracts	$ 1,489
1708082	8/8/2017	11/5/2017	89	Dept A	Fleet Parts	$ 567

Row Labels	Count of Department
Contracts	72
Fleet Parts	66
Communications	35
Fuel	15
Utilities	13
Office Supplies	8
Uniforms	4
Janitorial	4
Misc Purpose	2
Other Supplies	1
Grand Total	**220**

Payments for contracts, fleet parts, and communications dominate the late payments.



Department C has nearly one-third of the late payments but also note Depts D, B, and I.



Looking at Department and Purpose together we see a vital few areas where the problem is concentrated.

	Departments										
	A	B	C	D	E	F	G	H	I	J	Grand Total
Contracts	2	16	5	19	1	2	1	3	19	4	72
Fleet Parts	2	1	54	2	1	2		1	1	2	66
Communications	2	4	4	5	2	5	4	4	2	3	35
Fuel	1	3	1	5	2				1	2	15
Utilities	3	3	1	2		1		1	1	1	13
Office Supplies	3		2	1				1	1		8
Uniforms				1	1	1				1	4
Janitorial						3			1		4
Misc Purpose				1		1					2
Other Supplies				1							1
Grand Total	**13**	**27**	**67**	**37**	**7**	**15**	**5**	**10**	**26**	**13**	**220**

Targeted efforts to fix the problem.

1. Work with Dept C on Fleet Parts
2. Work with Depts B, D, and I on Contracts
3. Work with everyone on Communications

You can do this in Excel on your computer.

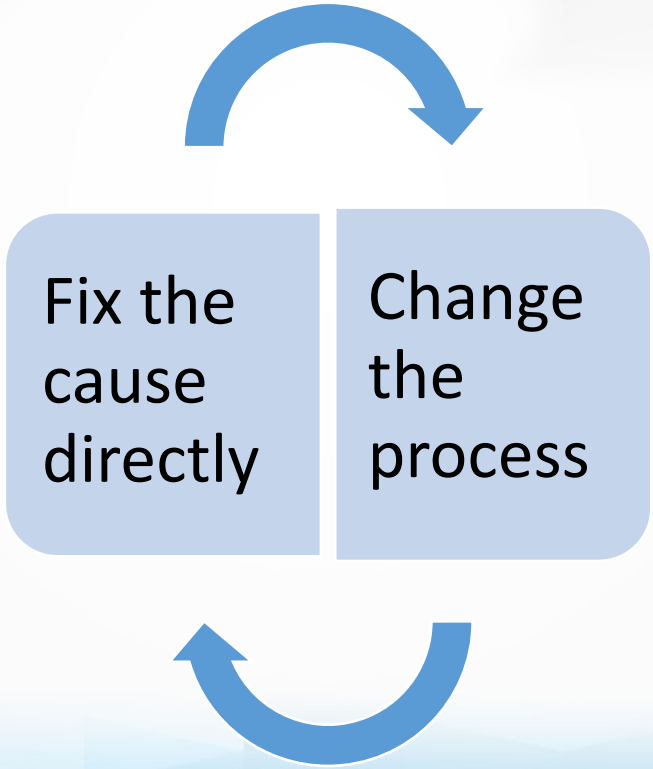
- Just use Pivot Tables
- Use Quality Improvement Software
  - www.qimacros.com as an example.

Use the Pareto Principle to focus your improvement efforts.

- Find the “Vital Few” that cause the most problems.
  - Base this on actual data whenever possible.
- Make and implement a plan to address these vital few.
- Monitor to see if you have fixed them.
- Repeat again and again for continual improvement.

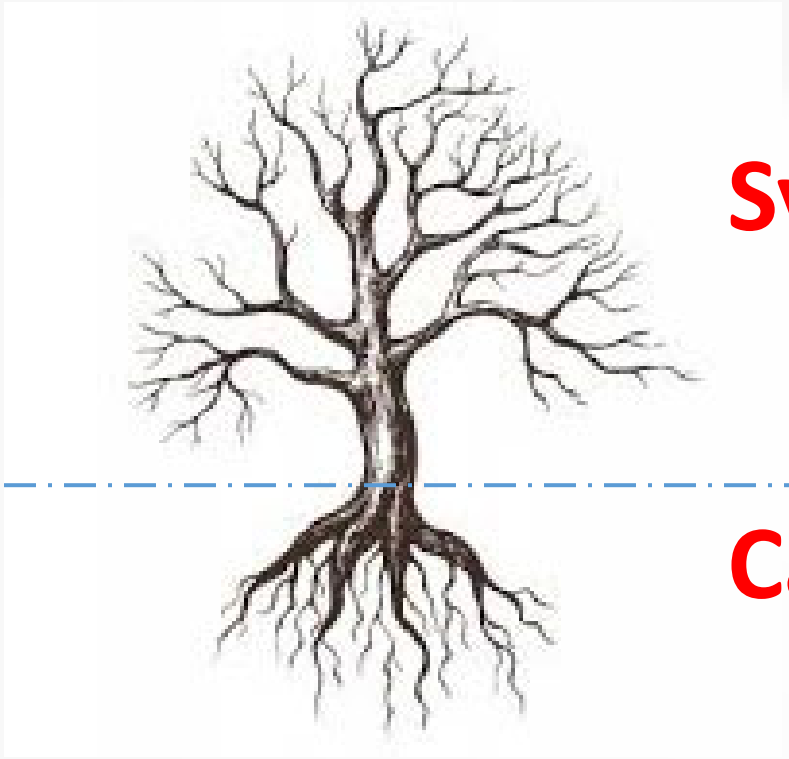
After you have sharpened your focus on your problem there are two primary ways to go.

Cause and Effect Analysis



Process Mapping and Design

Getting to the Root Problem
Cause and Effect Analysis



Symptom

Cause

Conducting a cause and effect analysis is straightforward.

Investigate

- **Identify the problem to be examined. Be specific. Base on data.**
- Choose major categories of cause.
- Brainstorm for causes. Drill down with the 5 whys to get at the root
- Review diagram for missing items or weak categories. Add as needed.

Prioritize

- Identify most likely targets for investigation
- Seek to confirm causes with data or prioritize based on risk.

Act and Confirm

- Create action plans to fix or prevent.
- Monitor to see if solution was successful.

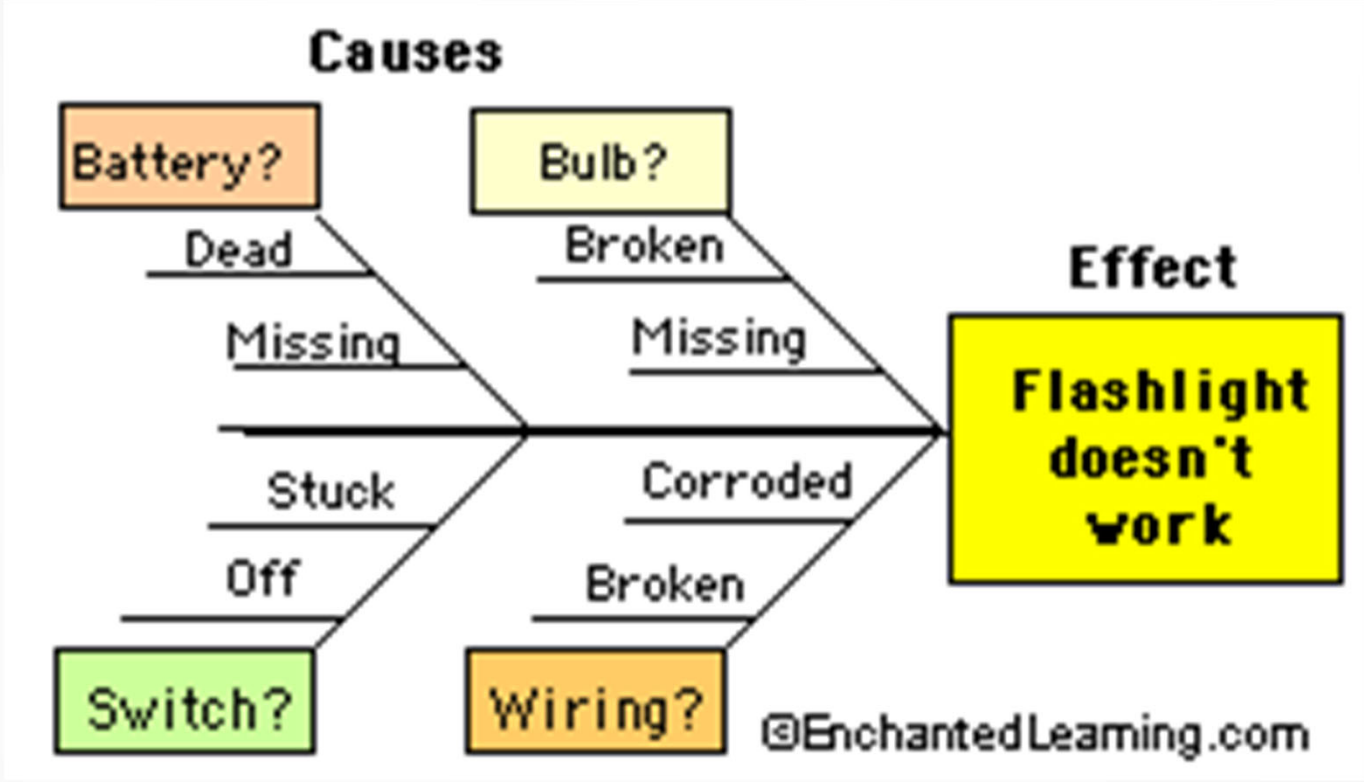
Cause and effect analysis is simple but powerful tool that can improve our problem solving.

- Can help us push beyond the usual suspects
- Provides structure to our thinking
- Press us to consider broad and balanced approach to problem identification
- Helps groups keep focus and facilitate participation.

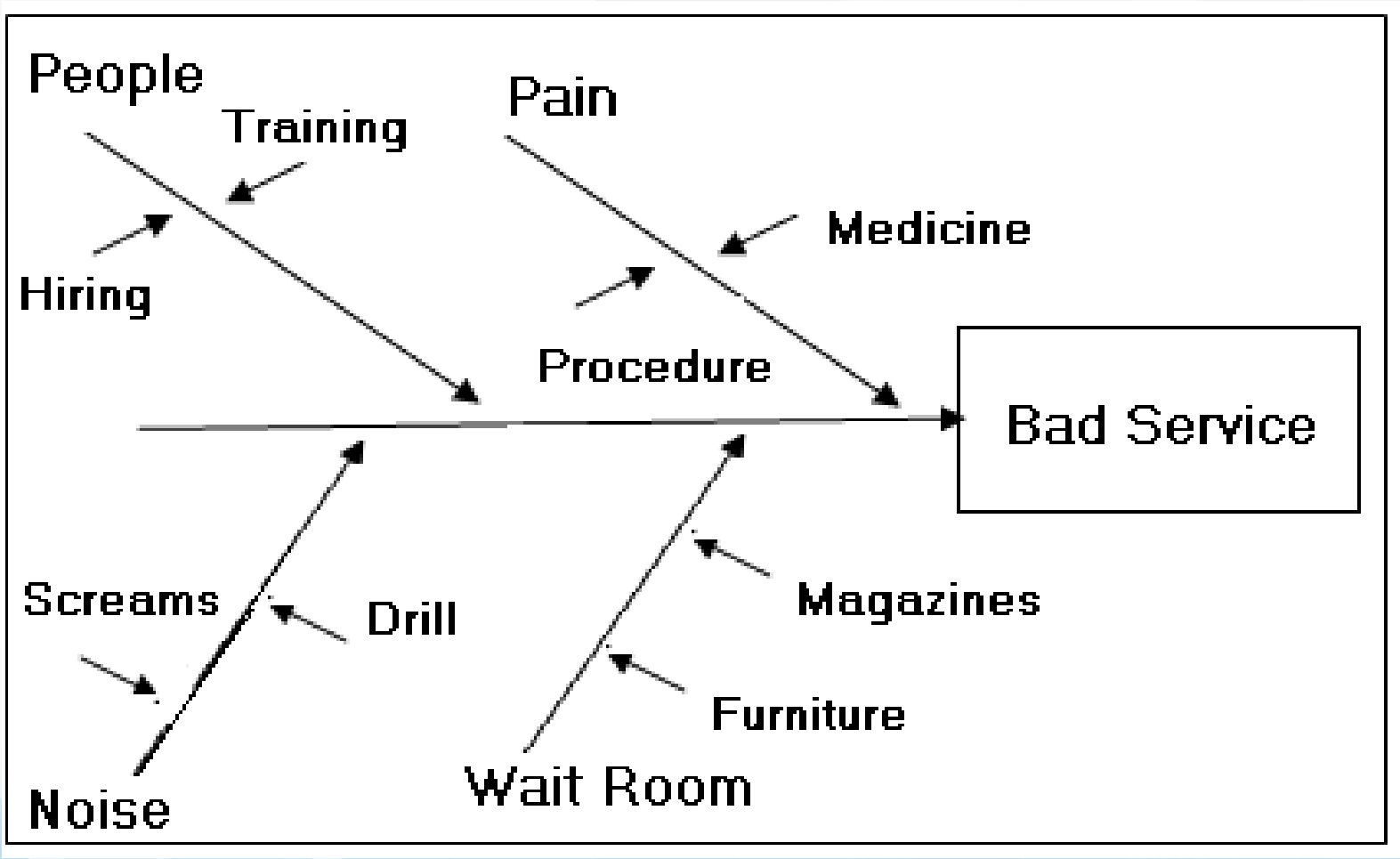
Select major categories of causes

- Starting off with major categories helps focus our attention but also prompts us to cover all the bases.
- Typical categories for services
  - People
  - Processes/Methods
  - Policies
  - Resources
  - Other

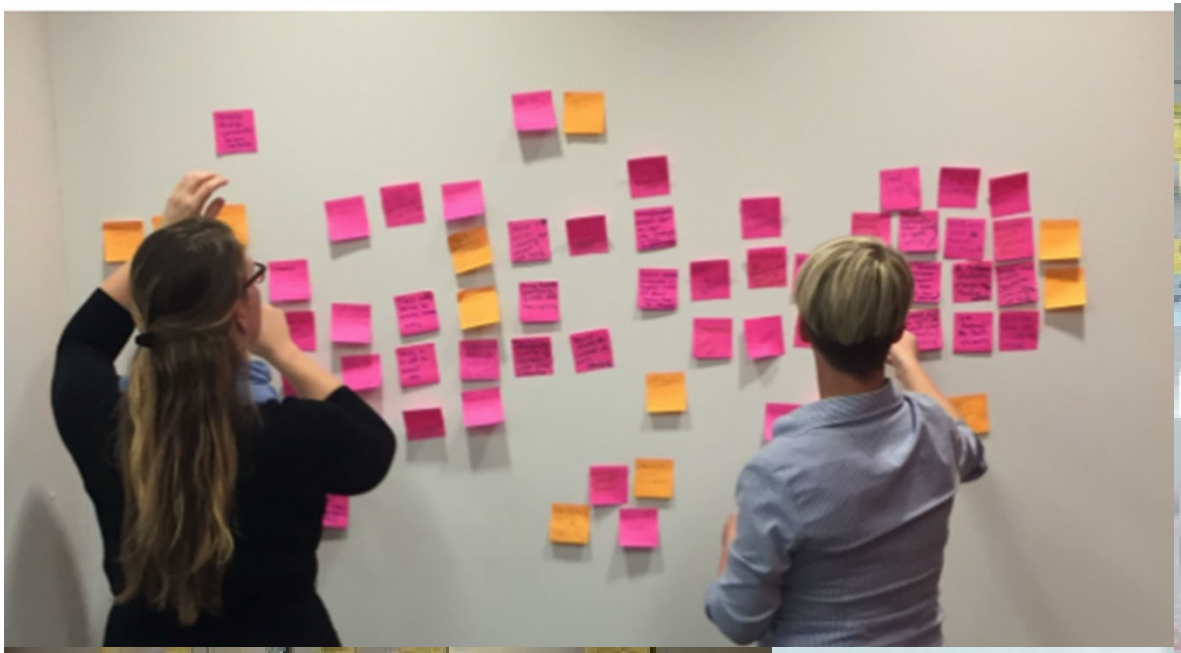
Causes of a flashlight not working.



Cause of bad service in a dentist office



Post-its are the tool for cause and effect analysis at the start.



Brainstorm for ideas of causes by category.

- Post-it Notes allow for flexibility and easy idea generation.
- Go randomly or work through categories sequentially.
- Silent method: Let individuals start by putting out ideas separately without talking
- Open brainstorming: talk it through out loud building the ideas as you go.

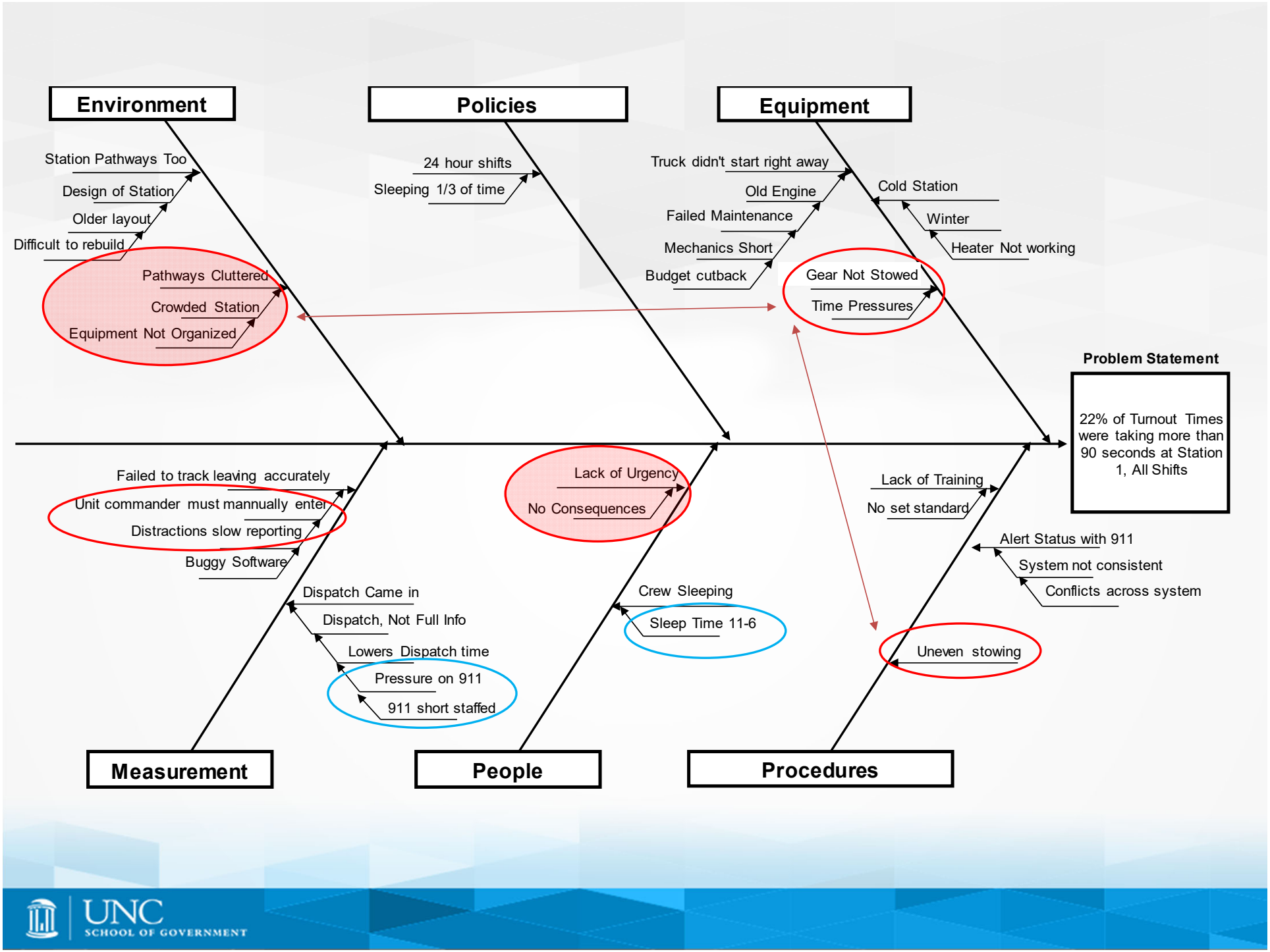
The five whys is a way of drilling down in a causal chain to get at the true root of the problem.

- Car stopped
  - Why did the car stop – It ran out of gas
    - Why did it run out of gas – didn't buy gas last night
      - Why didn't you buy gas – no money and credit card is topped out
        - Why didn't you have money …….
          - Why
            - Why
- Don't need to go down five levels but don't stop before you get to what feels like the root of the cause-effect chain.

Practice Exercise for Cause and Effect

- **What causes fire companies to have long turnout times?**

1. Do a post-up problem solving
   a) Individually and quietly list out all the causes you can
   b) Post up causes on a common board without talking
   c) Add causes that you notice individually
2. Working as a group, aloud, create the cause-effect diagram
   a) Eliminate duplicates
   b) Drill down with five whys
   c) Work until you get to where you are satisfied


Environment
Station Pathways Too
Design of Station
Older layout
Difficult to rebuild
Pathways Cluttered
Crowded Station
Equipment Not Organized
Policies
24 hour shifts
Sleeping 1/3 of time
Equipment
Truck didn't start right away
Old Engine
Failed Maintenance
Mechanics Short
Budget cutback
Cold Station
Winter
Heater Not working
Gear Not Stowed
Time Pressures
Problem Statement
22% of Turnout Times were taking more than 90 seconds at Station 1, All Shifts
Failed to track leaving accurately
Unit commander must mannually enter
Distractions slow reporting
Buggy Software
Lack of Urgency
No Consequences
Lack of Training
No set standard
Alert Status with 911
System not consistent
Conflicts across system
Dispatch Came in
Dispatch, Not Full Info
Lowers Dispatch time
Pressure on 911
911 short staffed
Crew Sleeping
Sleep Time 11-6
Uneven stowing
Measurement
People
Procedures

Cause and effect diagrams offer several values that are not obvious.

- By identifying many causes, the process can reduce the chances of overlooking causes or missing more promising options.
- Kept over time, the cause and effect diagram can be revisited for further improvements or when new problems arise.
- The cause and effect diagram can support dialogue across functional areas.
- Diagrams can be used for training new employees.
- Cause and effect diagrams can be used proactively to prevent problems.

Prioritize causes for action and figure out countermeasures or fixes.

- For root cause analysis, identify the key root cause (or possibly multiple ones) and design countermeasures (fixes).
- Consider the use of checklists as a means to standardize your process, prevent errors, and promote best practices.

Root Cause	Countermeasure Proposed Solution	Actions to Take
Poor layout	Clear Path	Work with crews to clear space
No urgency	Incentive System	Chief to set up incentives

Example of a Possible Countermeasure plan and prioritization for fire turnout.

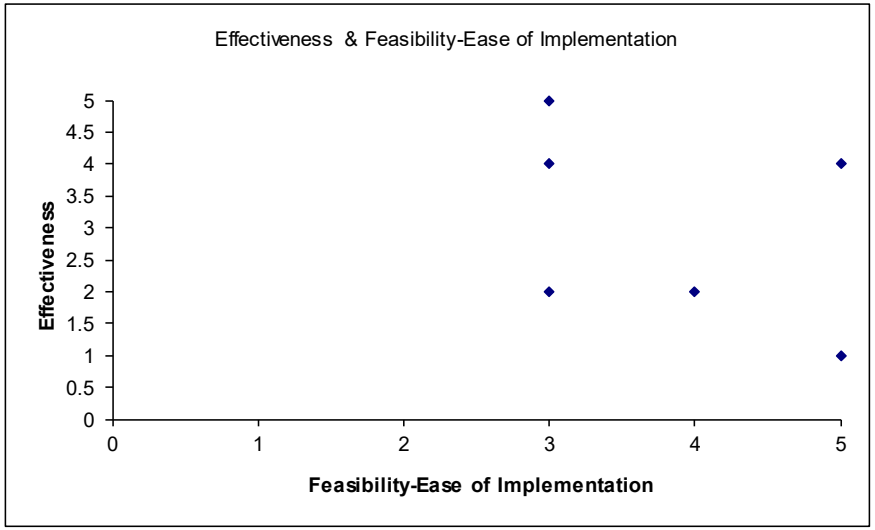
Problem Statement: 22% of Turnout Times were Taking more than 90 seconds at Station 1, All Shifts

Root Cause	Countermeasure/Proposed Solutions	Feasibility	Specific Actions	Effectiveness	Overall	Action (Who?)	Value ($/period)
Lack of Urgency	Lecture	5		1	5		
	Performance Reviews	3		2	6		
	Ice Cream Bet	5		4	20		
Pathways Cluttered	Clean Up Station	4	One time or monthly	2	8		
	Organize Equipment	3	Racks, labels	4	12		
	System for Putting Away Gear	3	Standard Procedure	5	15		

http://www.qimacros.com/quality-tools/solution

Feasibility: 1-low, 5-high
1-Expensive & Difficult to implement
5-Inexpensive and easy to implement

Effectiveness: 1-low, 5-high
1-Not very effective
5-Very Effective



World Health Organization

SURGICAL SAFETY CHECKLIST (FIRST EDITION)

Before induction of anaesthesia ▸▸▸▸▸▸▸▸▸ Before skin incision ▸▸▸▸▸▸▸▸▸▸▸▸▸ Before patient leaves operating room

SIGN IN

- ☐ **PATIENT HAS CONFIRMED**
  - IDENTITY
  - SITE
  - PROCEDURE
  - CONSENT
- ☐ **SITE MARKED/NOT APPLICABLE**
- ☐ **ANAESTHESIA SAFETY CHECK COMPLETED**
- ☐ **PULSE OXIMETER ON PATIENT AND FUNCTIONING**

DOES PATIENT HAVE A:

KNOWN ALLERGY?
- ☐ NO
- ☐ YES

DIFFICULT AIRWAY/ASPIRATION RISK?
- ☐ NO
- ☐ YES, AND EQUIPMENT/ASSISTANCE AVAILABLE

RISK OF >500ML BLOOD LOSS (7ML/KG IN CHILDREN)?
- ☐ NO
- ☐ YES, AND ADEQUATE INTRAVENOUS ACCESS AND FLUIDS PLANNED

TIME OUT

- ☐ **CONFIRM ALL TEAM MEMBERS HAVE INTRODUCED THEMSELVES BY NAME AND ROLE**
- ☐ **SURGEON, ANAESTHESIA PROFESSIONAL AND NURSE VERBALLY CONFIRM**
  - PATIENT
  - SITE
  - PROCEDURE

ANTICIPATED CRITICAL EVENTS

- ☐ **SURGEON REVIEWS:** WHAT ARE THE CRITICAL OR UNEXPECTED STEPS, OPERATIVE DURATION, ANTICIPATED BLOOD LOSS?
- ☐ **ANAESTHESIA TEAM REVIEWS:** ARE THERE ANY PATIENT-SPECIFIC CONCERNS?
- ☐ **NURSING TEAM REVIEWS:** HAS STERILITY (INCLUDING INDICATOR RESULTS) BEEN CONFIRMED? ARE THERE EQUIPMENT ISSUES OR ANY CONCERNS?

HAS ANTIBIOTIC PROPHYLAXIS BEEN GIVEN WITHIN THE LAST 60 MINUTES?
- ☐ YES
- ☐ NOT APPLICABLE

IS ESSENTIAL IMAGING DISPLAYED?
- ☐ YES
- ☐ NOT APPLICABLE

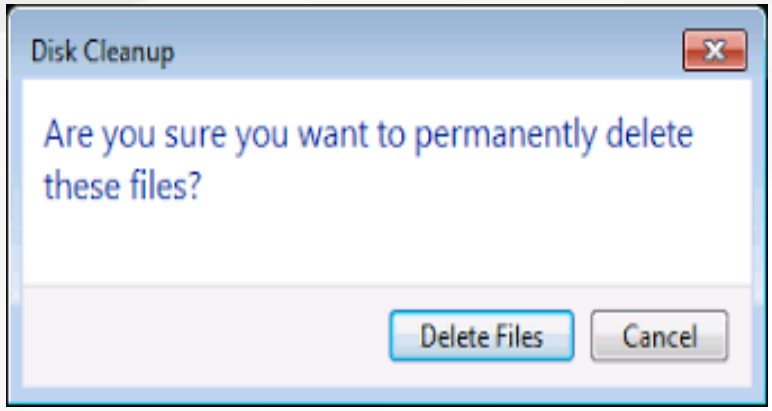
SIGN OUT

NURSE VERBALLY CONFIRMS WITH THE TEAM:

- ☐ **THE NAME OF THE PROCEDURE RECORDED**
- ☐ **THAT INSTRUMENT, SPONGE AND NEEDLE COUNTS ARE CORRECT** (OR NOT APPLICABLE)
- ☐ **HOW THE SPECIMEN IS LABELLED** (INCLUDING PATIENT NAME)
- ☐ **WHETHER THERE ARE ANY EQUIPMENT PROBLEMS TO BE ADDRESSED**
- ☐ **SURGEON, ANAESTHESIA PROFESSIONAL AND NURSE REVIEW THE KEY CONCERNS FOR RECOVERY AND MANAGEMENT OF THIS PATIENT**

THIS CHECKLIST IS NOT INTENDED TO BE COMPREHENSIVE. ADDITIONS AND MODIFICATIONS TO FIT LOCAL PRACTICE ARE ENCOURAGED.

Error proofing or “Poke-Yoke” is about trying to prevent mistakes before they happen.



Experiments are another natural tool to use with cause and effect analysis.

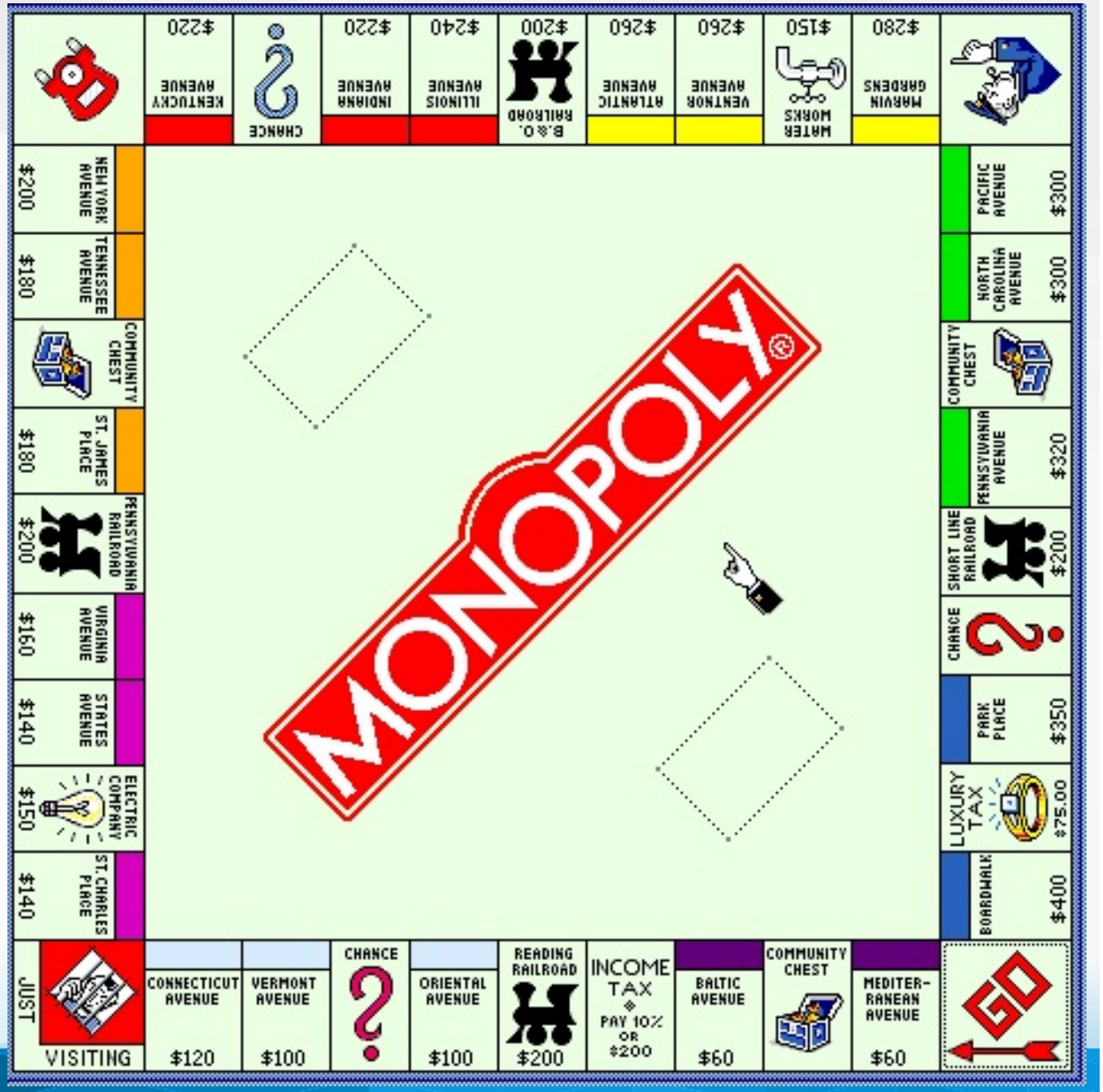
- Using what you devise from cause and effect analysis, design small experiments to test relationships.
- This is most important when you don't have data pointing to relationships or when the costs of a change may be large and you want to make sure it is likely to work.
- Even fairly simple experiments may be possible by controlling one or two items and using random assignment. For example, test over a short period whether one type of notification generates more citizen participation over another. Do emailed bills get paid faster than paper bills?
- There are a number of tools to do process improvement experimentation more efficiently and effectively such as DOE (design of experiements) and MVT (multivariable testing) but they are more advanced and you might want assistance or further develop these skills.

Cause and effect analysis is flexible tool that can be used for special cause, common cause, or future prevention efforts.

- Special Cause – reactive focused on special cause (what happened that day in that place)
- Common Cause – reactive but focused on common cause (what are the primary factors driving the underlying process)
- Failure Modes and Effect Analysis FMEA – proactive focused on preventing problems in the future (what could go wrong).

Mapping the Way:
The basics of process mapping

Describe a player's turn in Monopoly



A process map of a turn in Monopoly

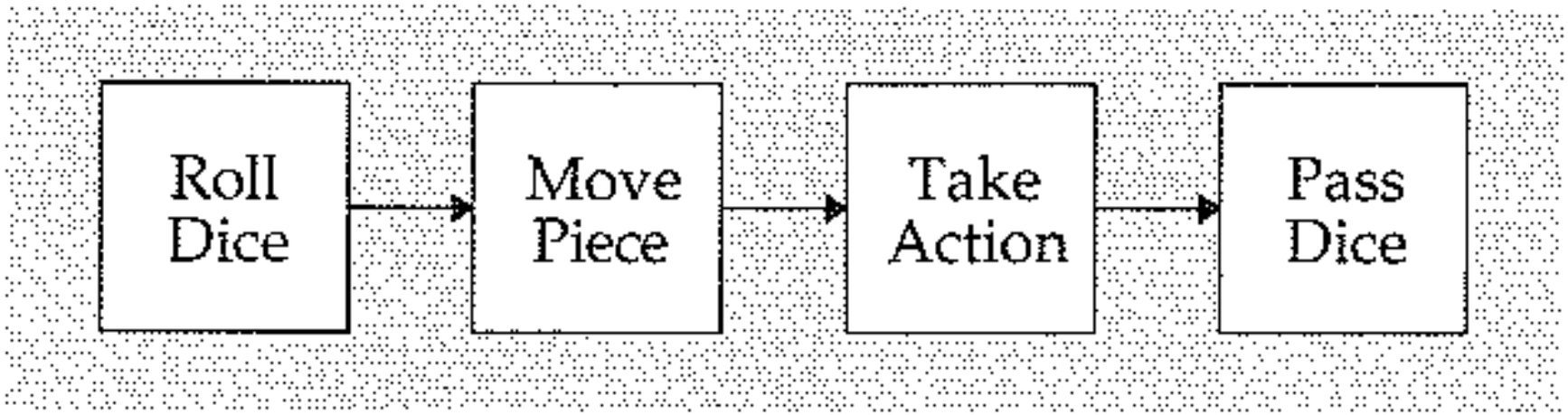


Figure 2.1: Block Diagram for a Turn in Monopoly

Source: Donald J. Wheeler and Sheila R. Poling, Building Continual Improvement .1998.

A more complex view of a turn in Monopoly.

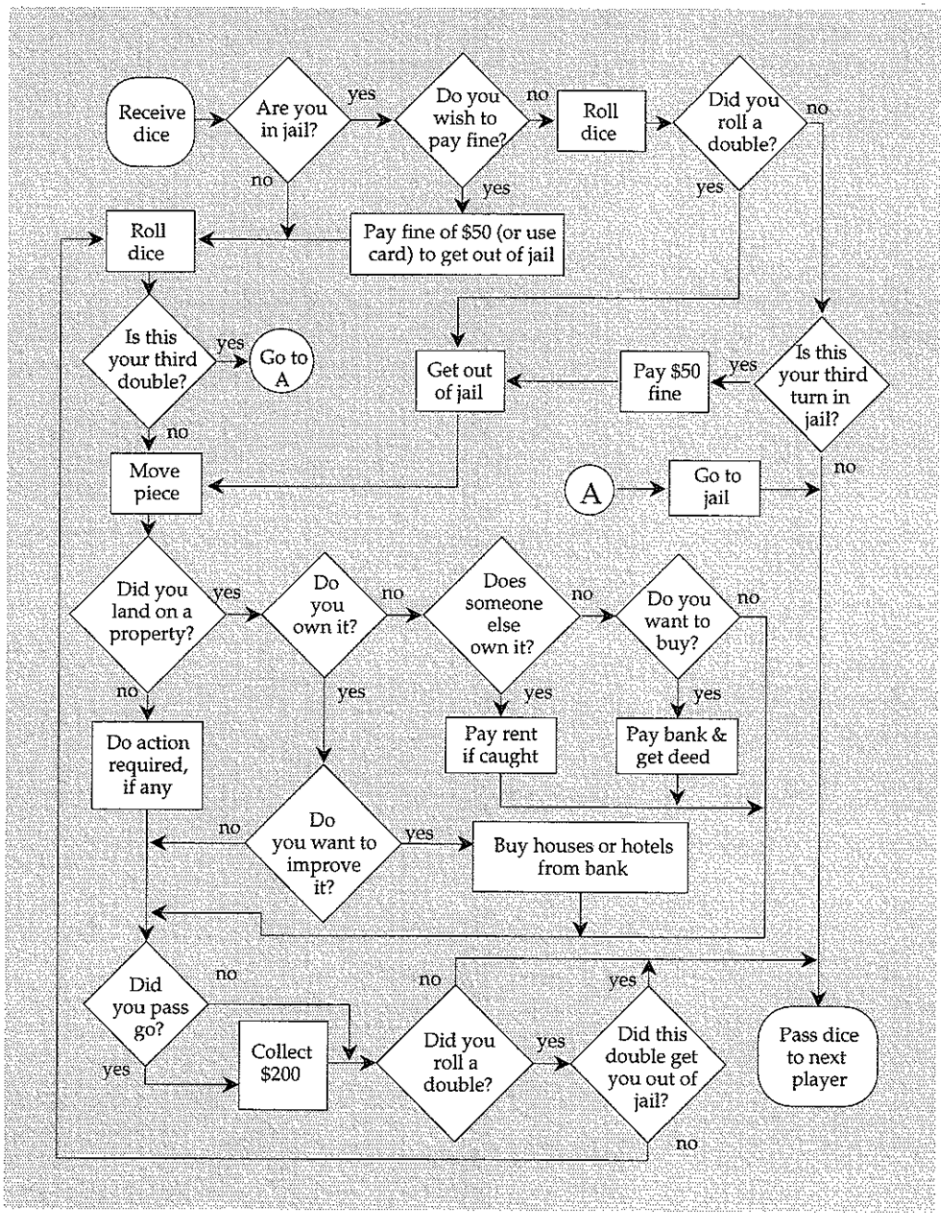


Figure 2.2: Flowchart for a Turn in the Game of Monopoly

Source: Donald J. Wheeler and Sheila R. Poling, Building Continual Improvement .1998.

A good process map requires work. Why do it?

- Visually document important process.
- Clarify and reach agreement on actual and desired process among participants.
- Communicate the process outside and to future employees.

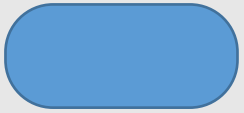
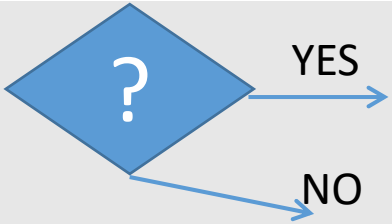
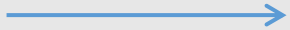
Simply clarifying and reaching agreement on your processes may eliminate some errors.

- **Identify opportunities for improvement by eliminating or reducing delays and errors.**

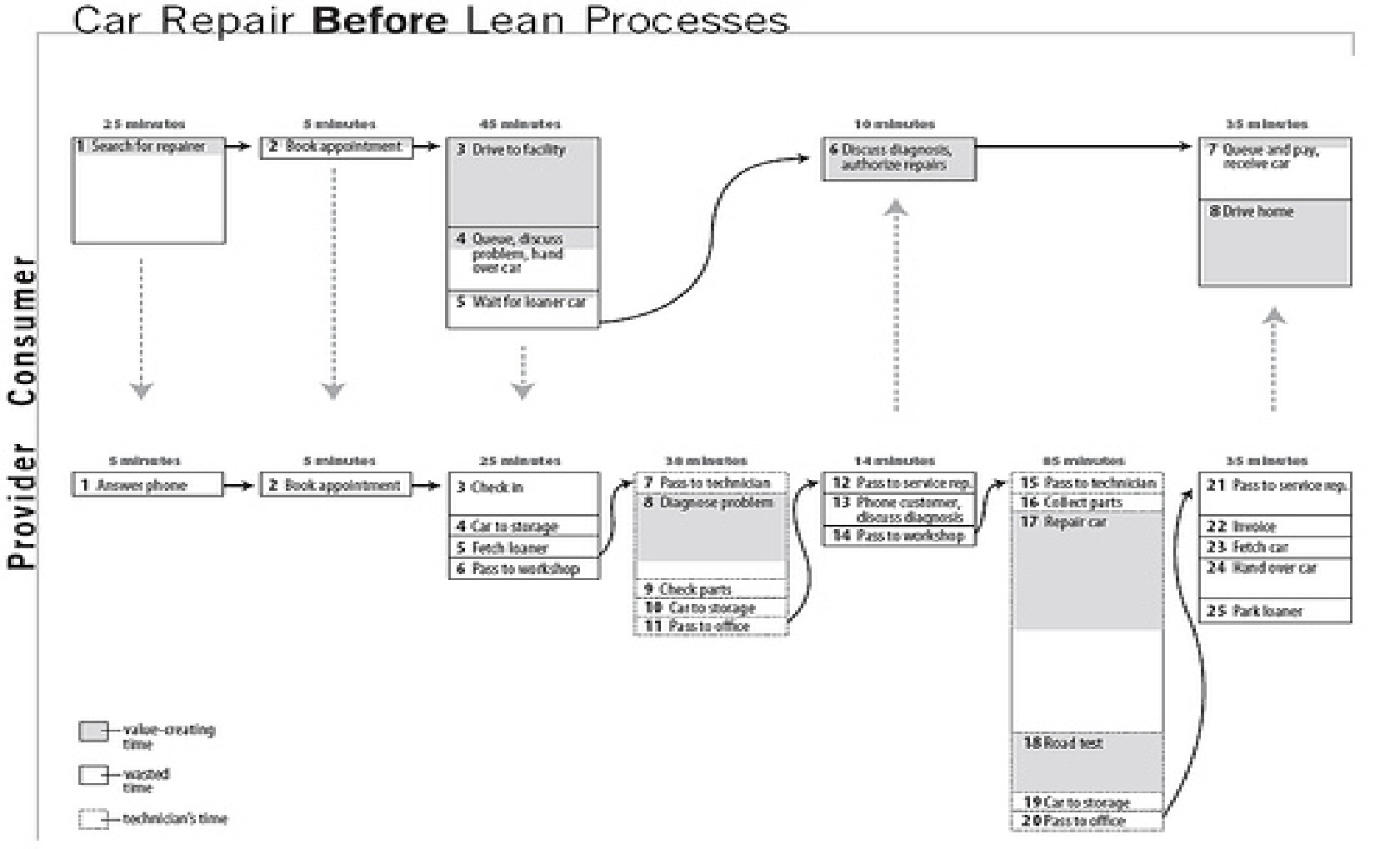
Process Flow:
Getting the steps lined up

- How a process moves from start to finish
- Key concerns are:
  - Setting the boundaries for the process (start to finish, what is and isn't included)
  - What level of detail to map
  - Getting the right people in the room. Make sure to include not just the top-level people but the people who actually carry out the steps.

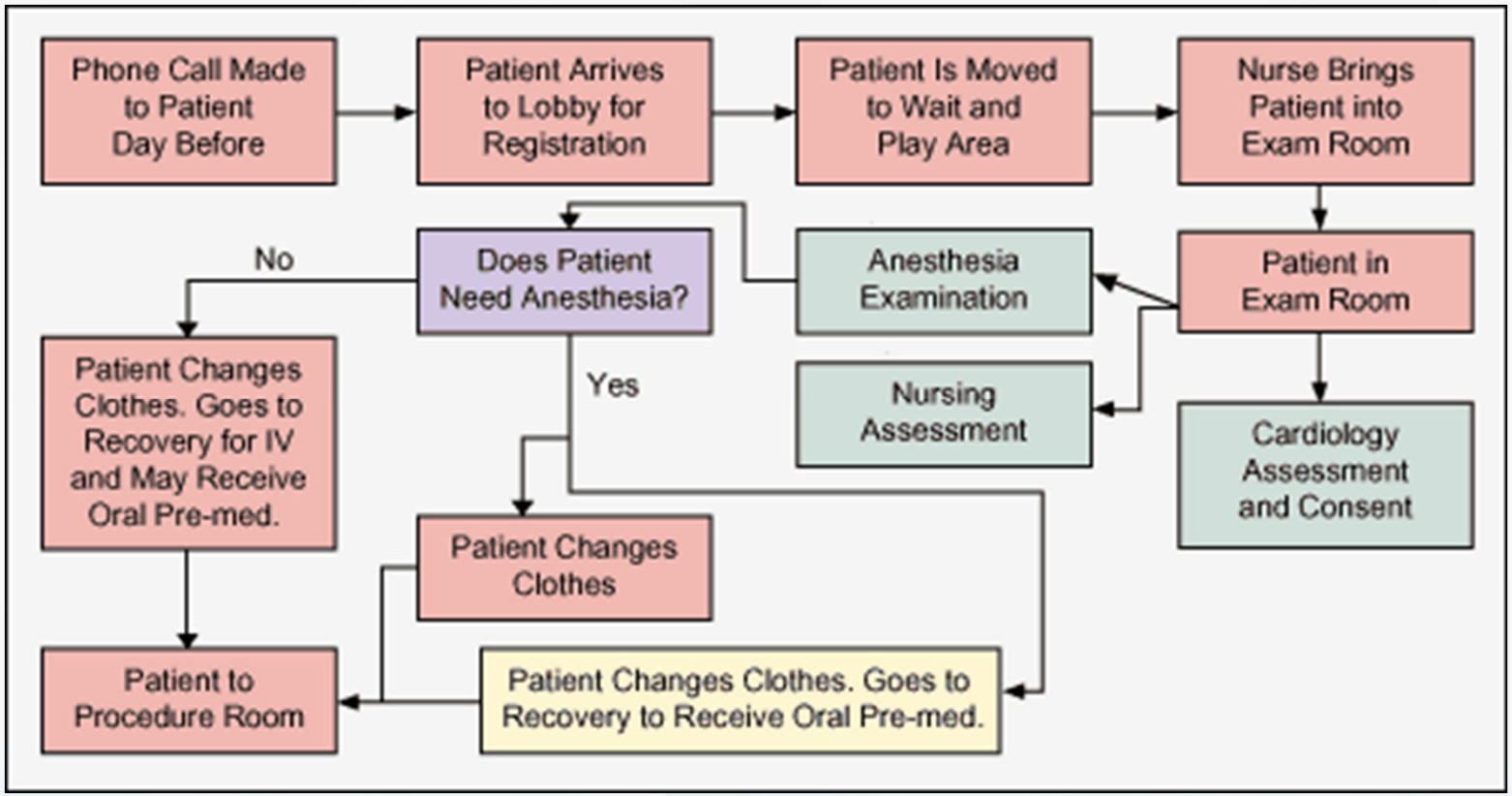
Basic Language

Elements in Process Map	Purpose	Object
Start/End	Used to show beginning and ending of process.	
Process Step	Describes a task step	
Decision Step	A choice has to be made, paths diverge.	
Jump Point	Used to keep the process map less cluttered with lines. Jump from point A to B	
Connector Lines	Lines to show ordering of steps in process	

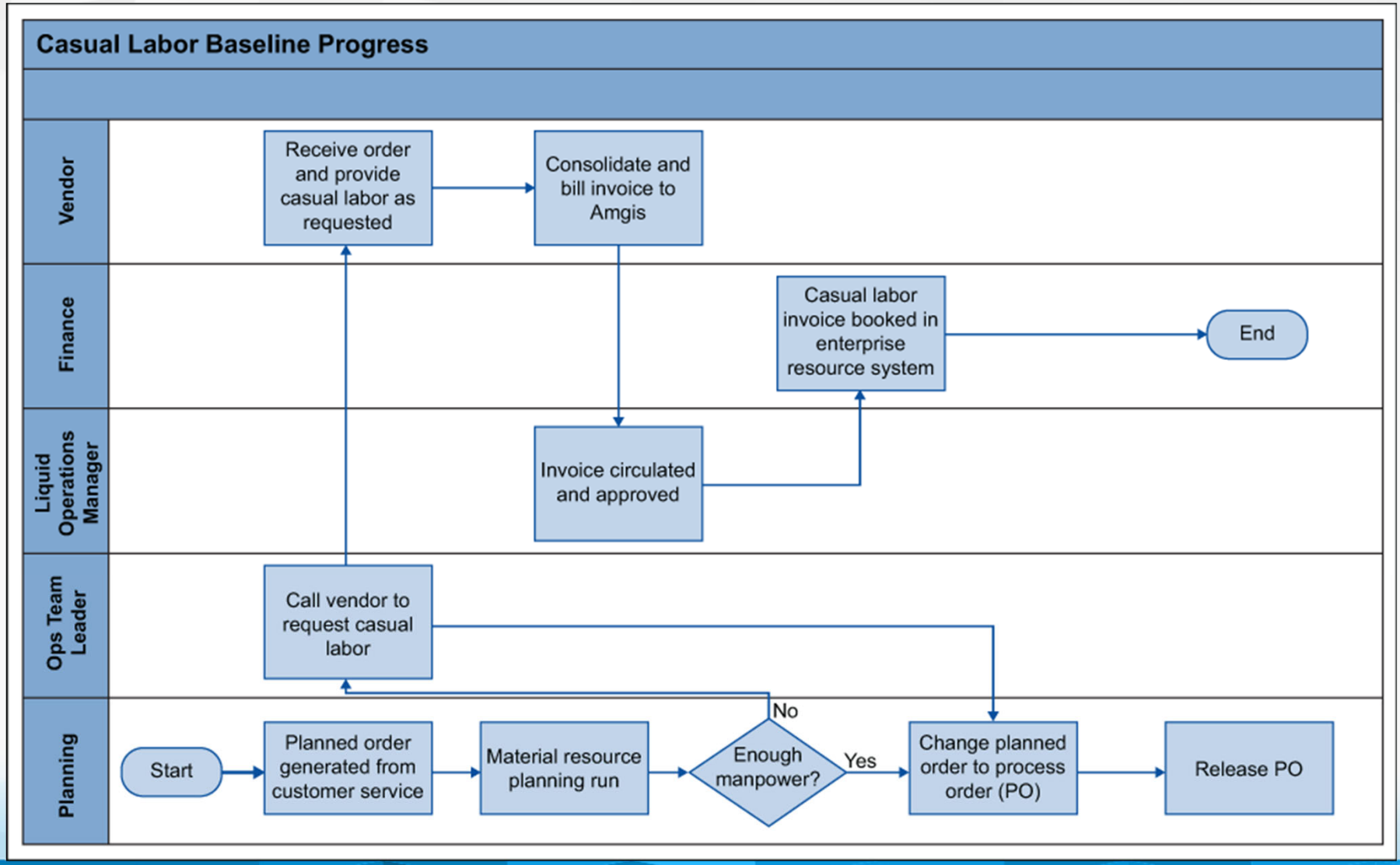
Process Map for Car Repair



Process flow for outpatient surgery

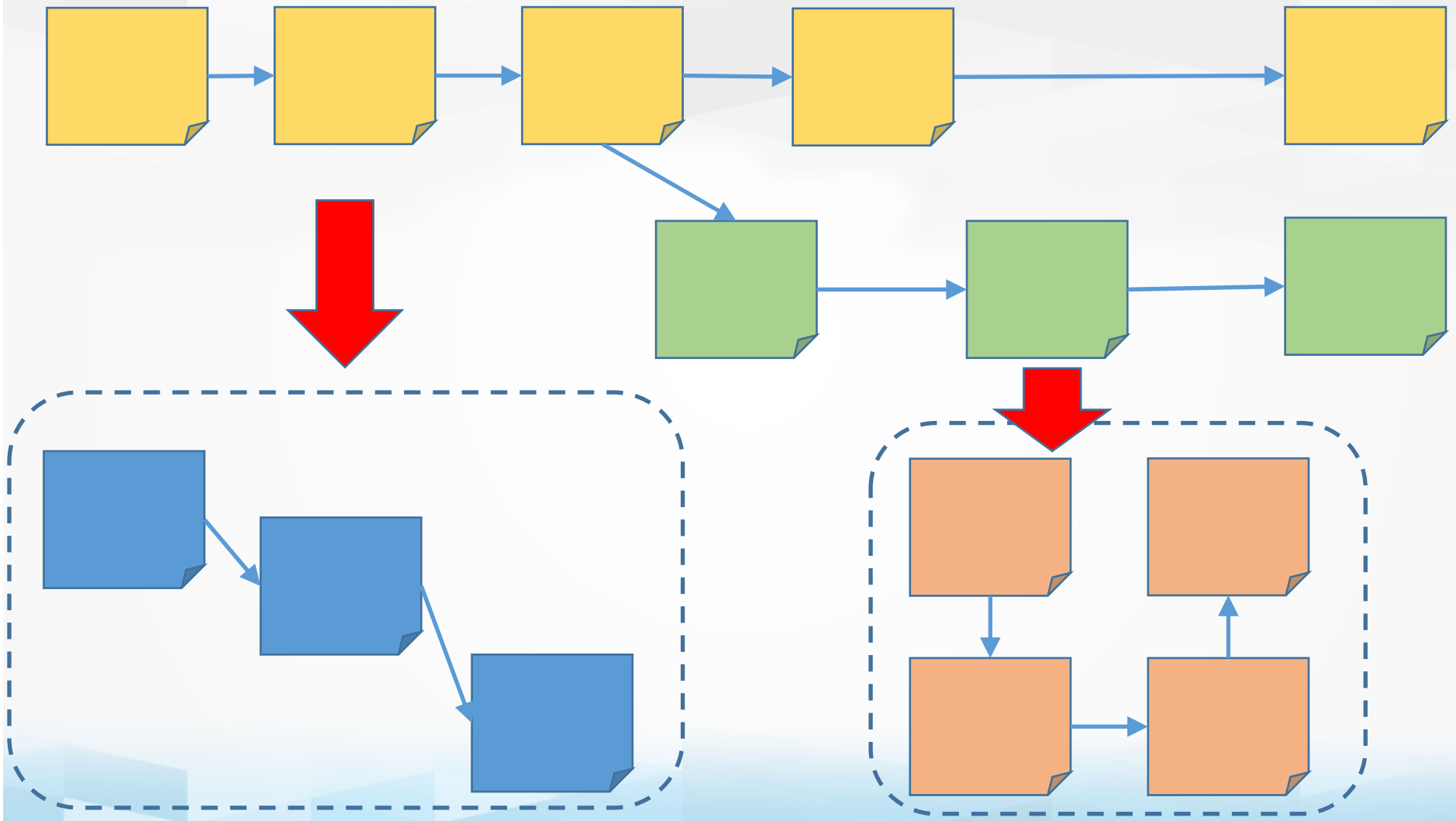


Process for hiring of casual labor



Example of a process flow with post-it notes. You don't need software.

What a completed process map might look like



Process Mapping Exercise: Hiring a New Employee

Try to map the process for how we hire new employees.

- Start with the point at which the position has been approved.
- End with a person is hired.

- Do this with post-it notes.
- Include all the steps.
- Be ready to move steps around as you discover steps you missed.

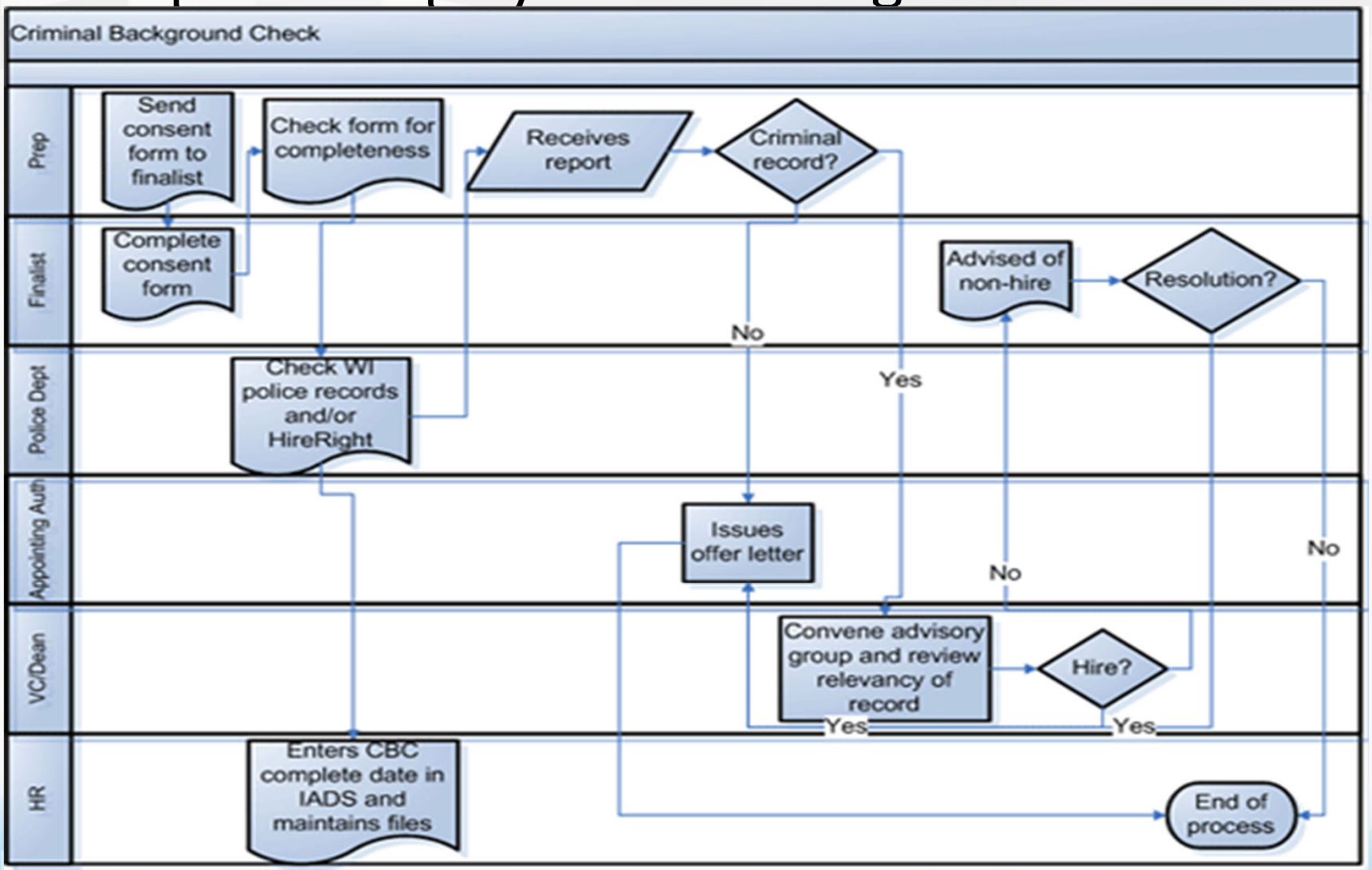
Clean up Process Map

- Turn post-it notes or drawing into computer drawing.
  - basic shapes in Excel to create chart or
  - specialized software to get a clean chart
- Add “swim lanes” to show who has responsibility for step.
- Create checklists to help people remember or keep on top of process.
- See process maps as part of your standard procedures documents
- Use process maps to train new people.

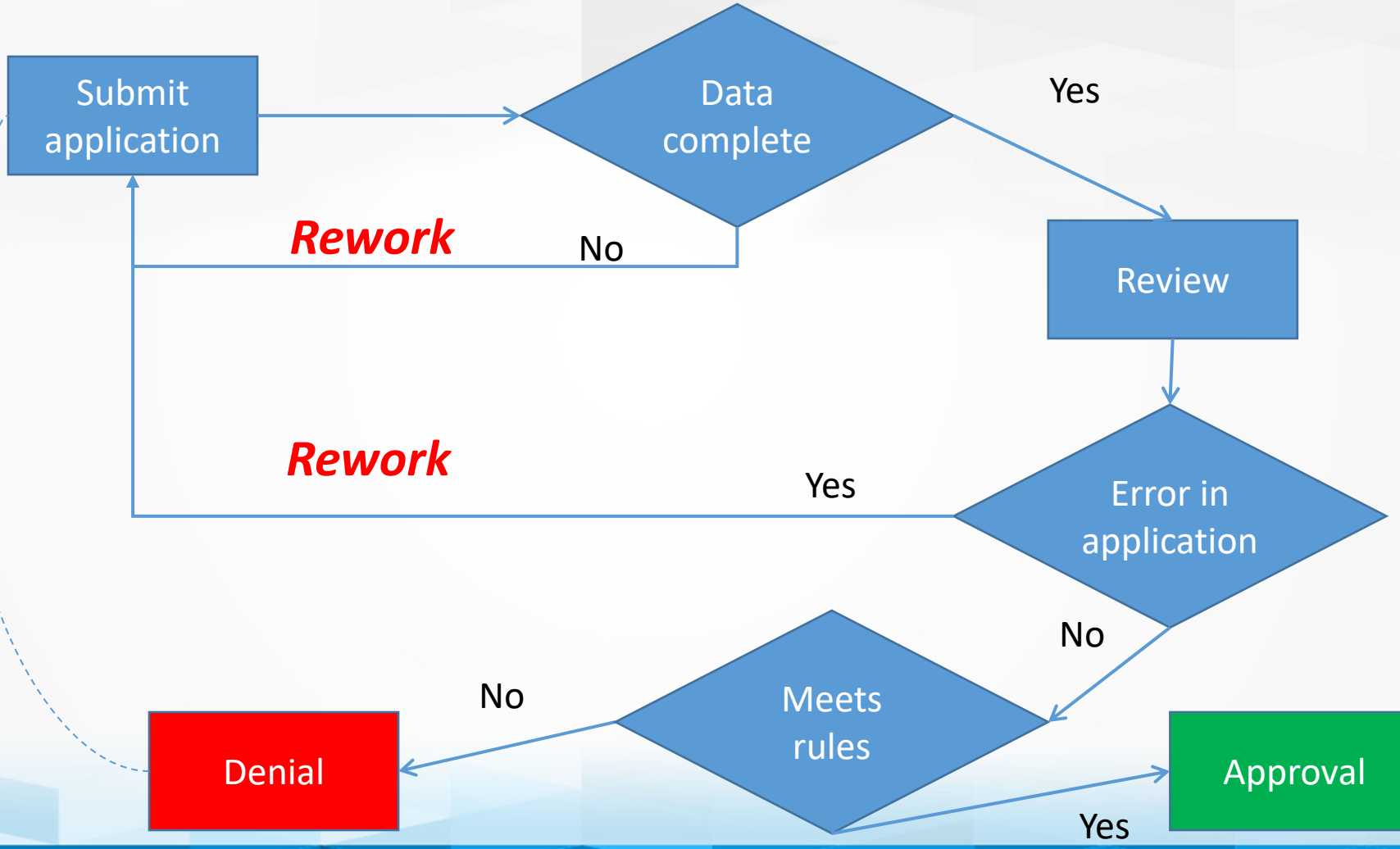
Tips to squeeze more out of process mapping.

- Use “Swim Lanes”
- Look for leverage points
  - Rework or clean up loops
  - Choke points
  - Backtracking
  - Non-value added steps
  - Gaps in waiting time between steps
  - Minimize movement of people or materials
- Create a physical/electronic version of the map to share and build on for the future.

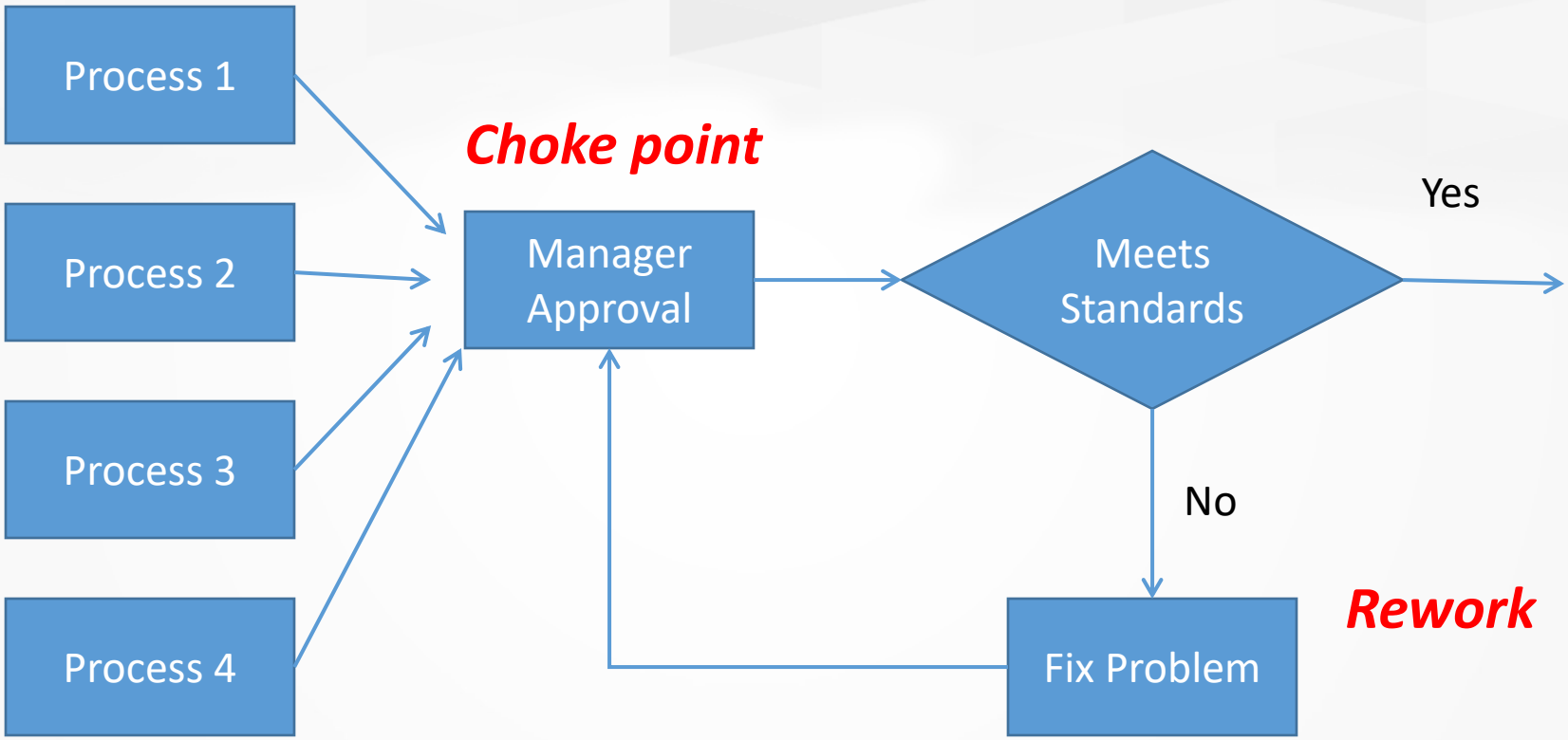
Think about using “swim lanes” which divides the process up by who is taking the action.



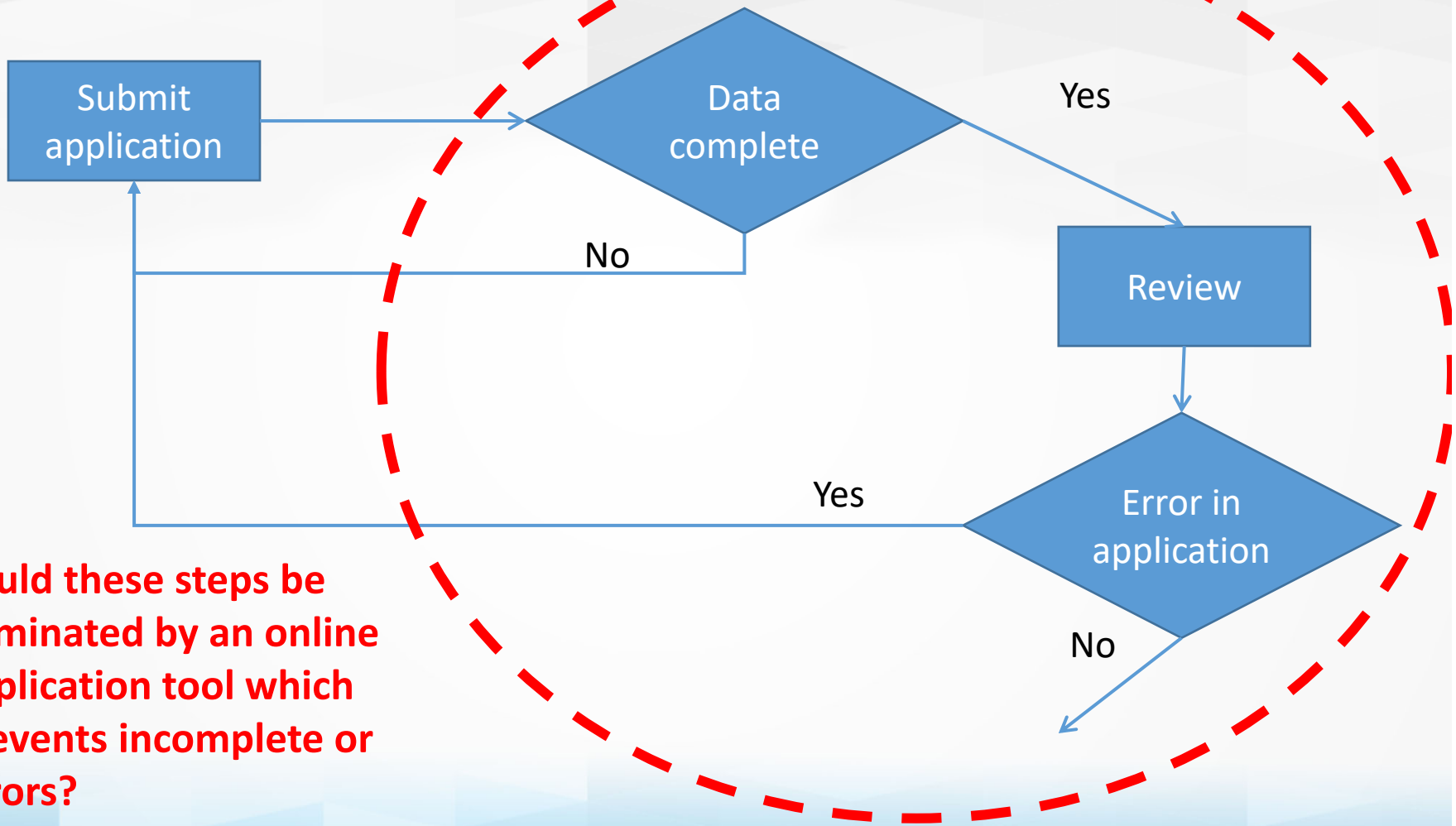
Rework or incomplete data



Choke points and backtracking can slow key processes



Does step add value or could it be simplified



Could these steps be eliminated by an online application tool which prevents incomplete or errors?

Identify key time delays

How long does your medical appointment take?

31 minutes for actual process

40 minutes waiting (idle time)

Check-in	Vitals by Nurse	Doctor Exam and Questions	Pay Bill
2 minutes	5 minutes	20 minutes	4 minutes
Wait 5 minutes	***Wait 20 minutes***	***Wait 10 minutes***	***Wait 5 minutes***

Some hints to making the most or process mapping

- The process map is a tool, not an end goal itself.
- Actually observe the process to confirm how it is being done.
- Decide on level of detail needed (high level or specific).
- Keep boundaries around the process based on your purpose. Don't try to include everything.
- Include a mix of people affected by the process to get all points of view. Don't forget "customer" or end user.
- May need two process maps: current process versus new future improved process.

Why bother with process diagrams?

- Explicit understanding of the steps
- Contrast between what you do and what you are supposed to do
- Seek agreement among multiple parties about what you do
- Find ways to improve the process
  - Eliminate unnecessary steps
  - Streamline process (parallel processing, better sequencing, fewer actors)
  - **Look to eliminate the delays between steps and the rework from errors. Speeds up the process without employees working harder. Work smarter not faster.**

Long hiring in Denver

Don’t just measure your performance, manage and improve it,

- Look to see and understand variation. Understand the difference between special cause and common cause variation. Use process behavior (control charts).
- Look for ways to focus your efforts. Process behavior charts, pareto charts, and cause and effect analysis. Fix the causes that are giving you problems.
- Look to map your processes and think about how they might be streamlined or have problems eliminated.
- Use simple tools like countermeasure matrices, checklists, error proofing, and experiments.

Some resources

Books

- Understanding Variation by Donald Wheeler
- Twenty Things You Need to Know by Donald Wheeler
- Making Sense of Data by Donald Wheeler
- Data Sanity by Davis Balestracci
- Fourth Generation Management by Brian Joiner
- The Toyota Kata Practice Guide by Mike Rother

Websites

- www.qimacros.com
- www.spcpress.com/djw_articles.php
- www.davisdatasanity.com/newsletter-archives/

Software

- www.qimacros.com for Excel control chart add-in and training materials on Lean Six Sigma
- http://www.mercerqualityconsulting.com/statistical-thinking.html for a less expensive add-in but it just does control charts.
- Google other software by using search terms like “SPC software” or “Excel add-ins for control charts”.
- See Excel template I created and shared which has limited features but can be used as a start.