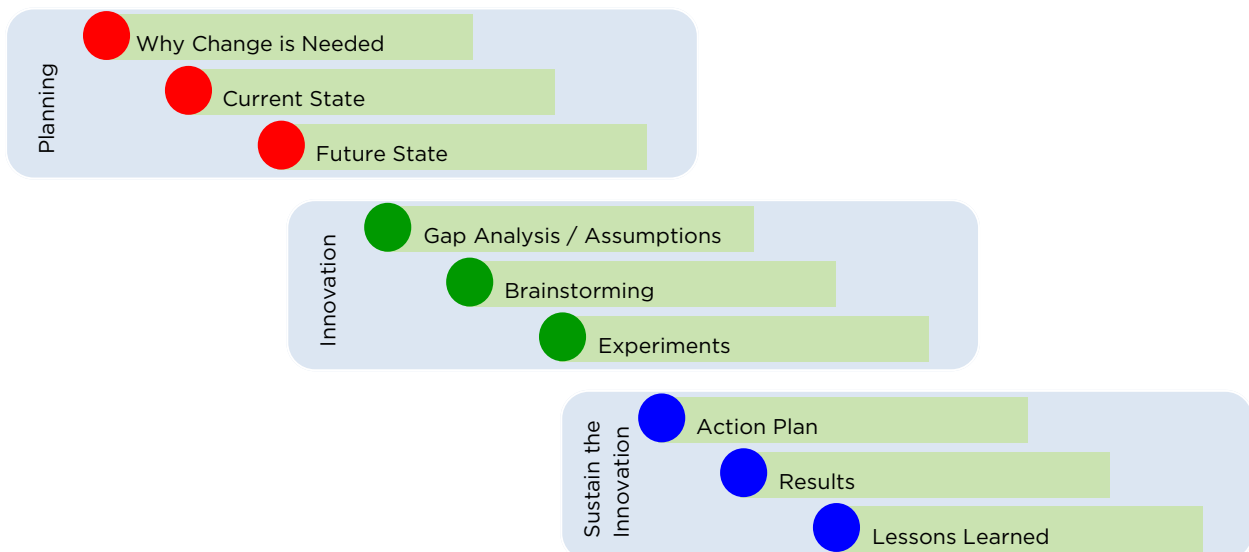## Overview

An **A3** is a planning tool that should be used to help plan innovations in your department or organization. It is the foundational tool for the primary innovations at the City of Providence:

Small-scoped change One to a few people involved	1-3 day facilitated event Few to several participants	Weeklong facilitated event Several participants Requires up-front analysis	Large scope Long-term Many participants

Customer-focused

What is an A3?

The A3 gets its name from the metric size of paper that's comparable to our 11x17. The A3 can be used to think through any issue, problem, or opportunity and is essential in clarifying the scope of an innovation. It's also helpful in building consensus and communicating the outcomes or improvements that result from an innovation. It's easy to start an A3, simply pull out a blank sheet of paper, created nine equal-sized boxes with headers that follow the A3 model/structure:

Planning
- Why Change is Needed
- Current State
- Future State

Innovation
- Gap Analysis / Assumptions
- Brainstorming
- Experiments

Sustain the Innovation
- Action Plan
- Results
- Lessons Learned

Structure of the A3

1. Why Change is Needed	4. Gap Analysis	7. Action Plan

1. Why Change is Needed

Sample Questions:
- Why are we doing/changing this?
- What is the circumstance or emergency demanding change (burning platform)?
- What is the chief complaint (i.e. Voice of the Customer)?
- What is the impact of this issue?
- Intent of the action
- Scope – start & end points

4. Gap Analysis
- What holds us back from the future state?
- What are the root causes of the road blocks?
- What tools are available to ID waste? Process maps, communication circles, fishbone diagrams, spreadsheets

7. Action Plan

Action Item	Assigned To	Date Finished

2. Current State
- Quantitative metrics of the current state (X widgets go through the process per year in Y days on average)
- Qualitative metrics (i.e. customer satisfaction)
- Graphically present picture of current state

5. Brainstorming

If we ...	Then we ...

8. Results

CS	FS	30d	60d	90d

3. Future State
- Quantitative metrics for the future (i.e. cut process time in half, double the output with current resources)
- Qualitative metrics (i.e. increase customer satisfaction by 25 percent)
- Include hard dollar savings, soft dollar savings, service level improvements, and human development
- Ensure metrics are clearly defined/achievable

6. Experiments

Action/Innovation	Actual Outcome

9. Lessons Learned

Went Well/Helped	What Didn't Go Well or Hindered

A3 Tips:

- Planning Tool
  - Use the A3 to think through any type of opportunity or issue your team is facing.
  - The A3 is strongly recommended when planning an innovation like a rapid improvement event, a workshop, Just Do It, or a project.
  - Metrics, metrics, metrics – Focus on outcomes and what gets better as a result of your innovation and use the A3 to document those outcomes.

- Communication Tools
  - Use the A3 to document your reasoning and your actions.
  - The nine boxes of the A3 serve as an effective outline for presentations and formal report documents.

- Consensus Building Tool
  - Use an A3 to extract expectations from your management team to align outcomes for your innovation.
  - The A3 is helpful in facilitating discussions about proposed innovation and ensures conversations are about the improvement, aren't personal, and aren't anecdotal.

Additional Resources/Support

- Contact the Department of Innovation if you have questions, need soft-copies of templates, etc.

A3 Template - Approach to Problem Solving & Improvement Events

Title
Team Members
Event Date

Exec Sponsor(s)
Process Owner
Version Date

P

1.Why Change is Needed

2.Current State

3. Future State

4.Gap Analysis

5. Brainstorming

6. Experiments

7.Action Plan

8. Results

9.Insights / Lessons Learned

Overview:

A Process Map is a diagram that visually displays a series of events, or steps that occur within a given process. There are several types of process maps, however, there is no wrong way to do a map. Maps are great visual aids that enable members of the team to understand and achieve standard work and continuous improvement. You will want to create a current state map first and use the 8 Wastes to help with the future state.

Try to include the following in every type of Process Map you create:
1. Put the title of the process, current or future state, and the date at the top of the process map
2. Define the start and end points
3. Identify who the customer of the process is
4. Use square sticky-notes for steps, and turn them into diamonds for decisions
5. Label the time it takes for each step as well as for the process as a whole
6. Identify value added, non-value added, and business necessary non-value added steps

Easy "How To" Using Sticky Notes:

Create a map by using post-it notes on a large roll of paper. Use different color post-it notes for action steps vs. decisions. It may be helpful to use a post-it note as a square for action steps and a diamond for decision points. Each post-it note should represent a different step in the process. Note the diagram below:

Sample Process Map — Current State
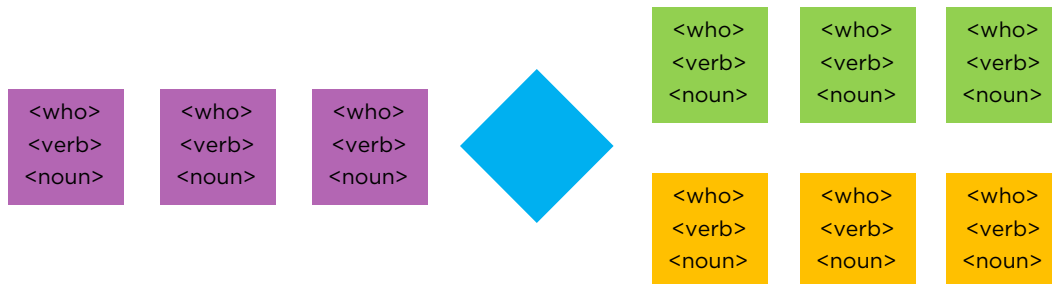
A completed process map may look something like the following example:

When your team has documented your current process, review the map and look for the following:

- Duplication of steps
- The 8 Wastes or "**DOWNTIME**"
- Value Added vs. Non-Value Added steps. Remember: The *customer* defines value, not you
- Where are the opportunities to improve the process?
  - ∗ Mark these opportunities to help create a future state

General Rules of Thumb:

- Left to right is notionally when steps take place
- Mark milestones and/or time to deliver value to your customer
- Document volumes of "widgets" that go through the process
- Boxes = steps in a process (label "who and use verbs)
- Diamonds = decisions (yes/no, if/then)
- Use pink stickies to represent waste/issues; other colors can be used for different work groups or individuals
- Processes can occur at the same time, with one process shown above or below the other (known as 'swim lanes')

<u>Remember</u>
You're not going to break anything!
Strive to ensure it's accurate and reflects the work that's actually done!

DOWNTIME Worksheet:

Use this worksheet to identify waste and make notes about how to eliminate it:

Type of Waste	Notes
Defects Something that causes rework, like and unintended over issuance	
Overproduction Many extra copies of applications that have now become obsolete	
Waiting time Waiting for clients to submit certifica-tions	
Non-utilized Human Talent Walking clients to child support enforcement — 40 hours were spent and 33 miles were walked/month	
Transportation Needlessly going to another location for a meeting that could happen over the phone	
Inventory Volume of applications to process	
Motion Unnecessary human movement	
Excessive Processing Extra steps in a process simply because we have always done it that way	

Overview:

DOWNTIME is a tool to identify the 8 types of waste that can exist in a process. Different approaches to Lean may include 7, 8, or 9 types of waste. The important component is to ensure we are observing a process, identifying waste, and identifying how to eliminate the waste. This Lean tool is born out of the belief that waste is **disrespectful** to:

- **HUMANITY** — because it wastes scarce resources
- **CITIZENS** — because it asks them to endure and pay for processes with no value
- **INDIVIDUALS** — because it asks them to do work with no value

The 8 Types of Waste: DOWNTIME

| The 8 Wastes	Related Examples & Questions
1. <u>D</u>efects	• Is there rework because of errors, poor quality control, or lack of standards?
2. <u>O</u>verproduction	• Pushing work downstream before the next person is ready • Producing reports no one needs • Entering repetitive information
3. <u>W</u>aiting	• Waiting for info, resources, or approvals • Dependency on others to complete tasks • System response or down time
4. <u>N</u>on/under-underutilized human talent	• Underuse of people's talents or skills • Printers, computers, and scanners not being used
5. <u>T</u>ransportation	• Email distribution lists not up-to-date • Unorganized workspace • Multiple handoffs
6. <u>I</u>nventory	• Extra office supplies or other inventory than is needed • Files awaiting task completion • Filled inboxes (paper and electronic)
7. <u>M</u>otion	• Unnecessary data entry or motion between areas • Searching for work documents or other supplies • Hand carrying paperwork to other departments
8. <u>E</u>xcessive Processing	• Can some tasks be combined or eliminated? • Is too much time spent on unnecessary tasks?

Overview:

A spaghetti diagram is a visual representation of physical space using a continuous flow line tracing the path of an item or activity through a process. The continuous flow line enables process teams to identify redundancies in the workflow and find opportunities to expedite the process. This diagram is intended to show:

1. The layout of the work area
2. The motion of how a customer and team members work
3. Any unnecessary movement
4. Better layouts

How to create a Spaghetti Diagram:

It is simple. On a large piece of paper, butcher block, or flip chart, draw the floor or room in which this process takes place. Include furniture, stairs, hallway, etc. Now, trace the path of individuals moving through this process.
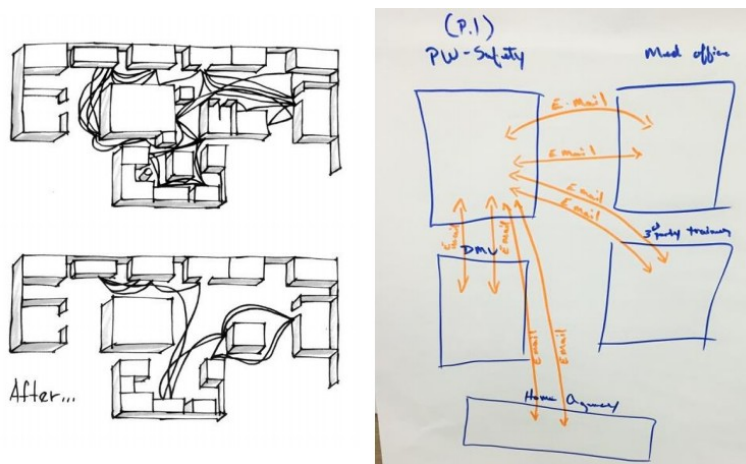
- Note how long it takes for each movement.
- Note how far it is.
- Does the movement happen on different floors or even different buildings?
- If you are mapping different people, it may help to use a different color.
- Assess the map for excess movement, stops, or strange movements.

Helpful Hints:

- Where does it start?
- Where does it end?
- Are all motions equally important?
- What are the value-added steps?
- What are the steps we can do without?
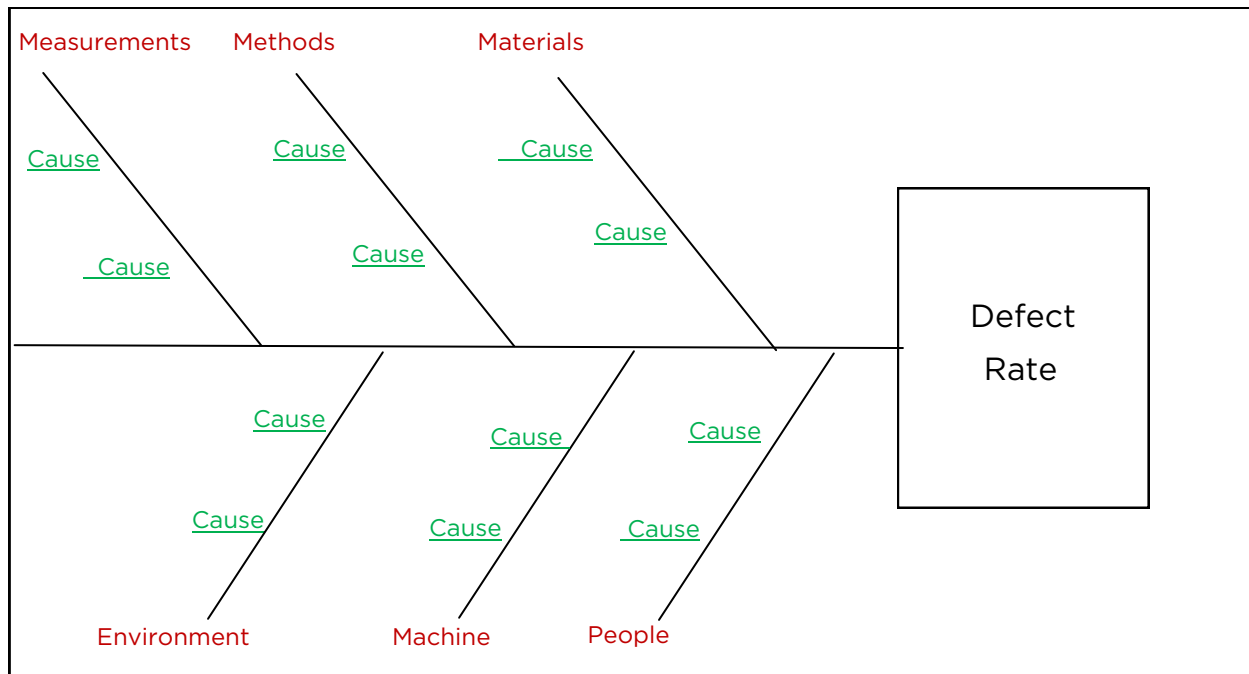- Can a 15-year-old understand what is happening on this map?

Overview:

A Fishbone Diagram is a type of root cause analysis. By using a Fishbone Diagram one is able to identify and organize causes to a problem so that the causes can be prioritized for further investigation. The diagram is intended to show:

- The problem (or effect)

- The categories of the causes of the problem

- The specific causes of the problem

How to create a Fishbone Diagram:

It is simple. Once a problem (or effect) is identified, create the body of a fish on a large piece of paper, butcher block, or flip chart. The problem is the "head" of the fish (the "Defect Rate" in the diagram below). Label the categories of causes (Environment, Methods, Measurements, Materials, Machine, and People), and then brainstorm the specific causes of the problem as a team. Remember, you can be creative and use categories other than those mentioned here (Software, Market Conditions, etc.).

Measurements	Methods	Materials	
Cause	Cause	Cause	
		Cause	
Cause	Cause		Defect Rate
	Cause	Cause	
Cause	Cause	Cause	
Environment	Machine	People	

- Always identify the causes in a team environment

- Team members should include process owners, process supervisors, practitioners, and subject matter experts

- Be flexible with the categories of causes

Typical Transactional Cause Categories:

- Policies — high level decision making

- Procedures — step-by-step instructions

- Plant — physical space where the problem occurs

- People — employees or customers

Typical Manufacturing Cause Categories:

- Personnel — training and experience
- Materials — raw materials or equipment
- Measurement — gauge or inspection
- Method — procedures
- Machine — settings or tools
- Environment — nature or noises

Typical Manufacturing Cause Categories:

- The purpose of a fishbone diagram is to identify causes to a problem through categorization, and determine whether the causes are within or are outside of the control of the team/process owner.

- Causes within the control of the team/process owner can then be prioritized for future potential investigation/waste elimination.

- A fishbone diagram can be used in a Rapid Improvement Event after process mapping the "current state" and identifying Kaizen opportunities.

- Adjust the cause categories to fit the problem — for example, it may make more sense to use causes such as technology, vendors, and training when brainstorming causes for problems in inventory/receiving for purchasing transactions.

- It may be effective for the team to brainstorm specific problems first (onto sticky notes), and then determine the categories.
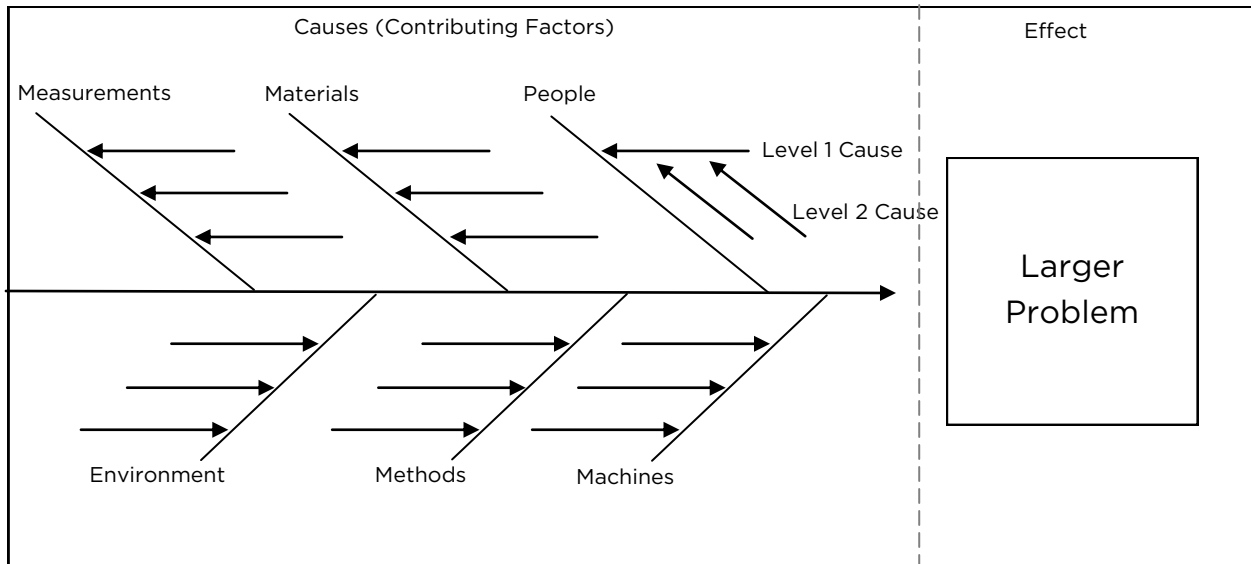
Overview:

Communication Circle is a visual representation of the communication steps that occur between departments, staff, and customers during a process. The Communication Circle will:

- Identify all the major actors in the process

- Define the types of communication that will be used and to whom

- Help find possible bottlenecks and the need for centralized communication

How to create a "before and after" Communication Circle:

It is simple: on a large piece of paper, draw a large circle and write the name of people or part of the organization that is involved in each process or transition. Connect the individuals and organization by drawing a line to each player as you move your way through the process.
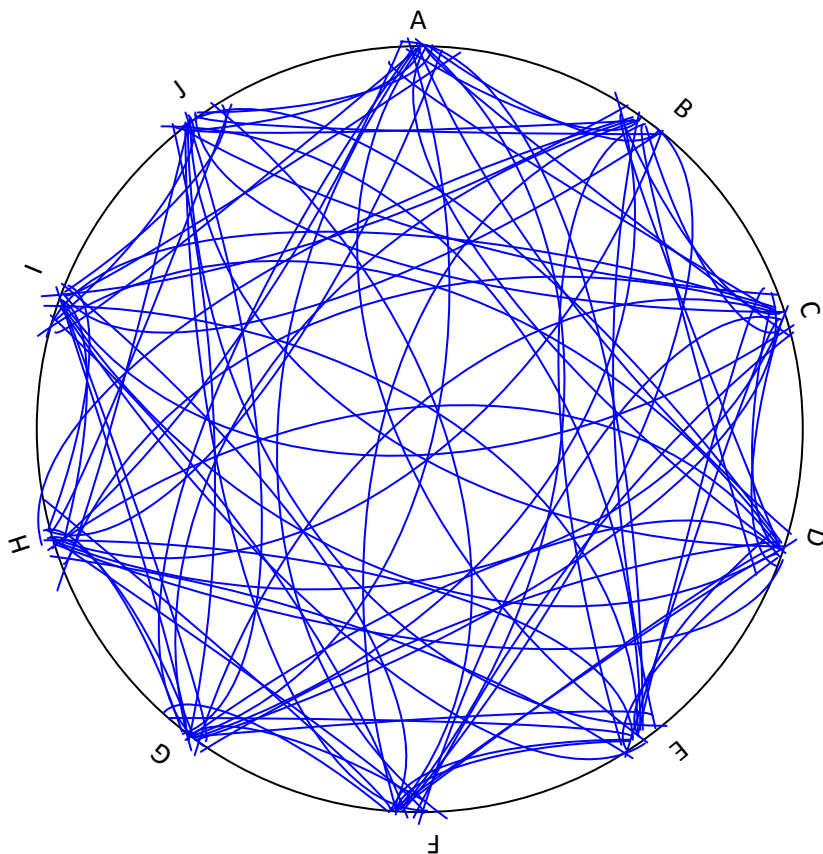

- If you are mapping different kinds of communication, such as email, phone, or other, it may be helpful to use different colors.

- Assess the circle for excess movement, process, stops, or bottlenecks.

- Count how many people are involved, how many forms of communication, and how many transactions. Can you eliminate any steps?

- When complete, draw a new communication circle and compare.

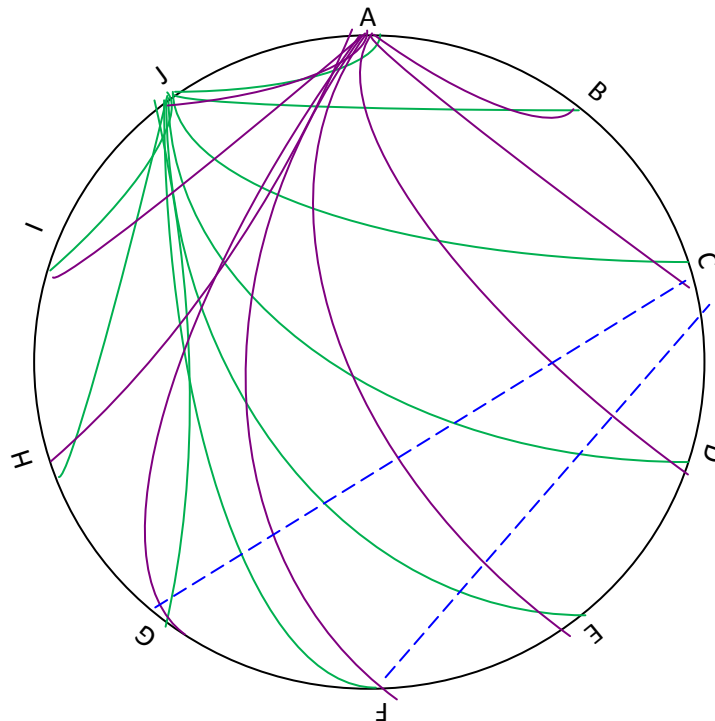DEPARTMENT OF INNOVATION
CITY OF PROVIDENCE

Helpful hints:

Use the title of the section or division, not individual's names. Make sure you draw a large circle. You will be surprised how many people or customers are involved. Remember, you are looking for redundant and duplicative communications as well as bottlenecks that can be alleviated.

Before:
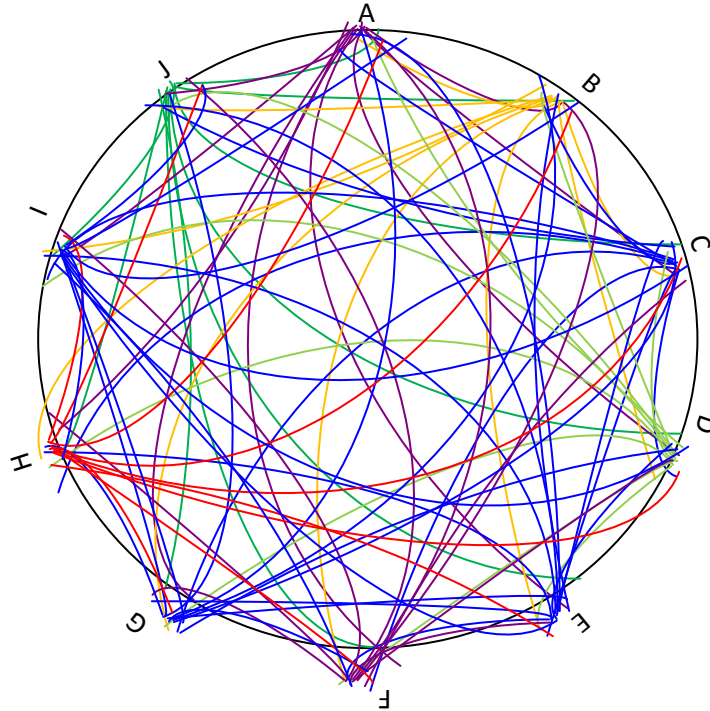
After:

Overview:

5 Whys refers to the practice of asking five times why the situation has occurred in order to get to the root cause(s) of the problem. It illustrates the importance of digging down beneath the most obvious cause of the problem. Failure to determine the root cause assures that you will be treating the symptoms of the problem instead of its cause, in which case the disease will return, and you will continue to have the same problems over and over again.

Note:
1. The actual number of whys is not important so long as you get to the root cause
2. There can be more than one cause of a problem.

Example One
Problem: You are on your way home from work and your car stops in the middle of the road.

1. **Why** did your car stop? — Because it ran out of gas.
2. **Why** did it run out of gas? — Because I didn't buy any gas on my way to work.
3. **Why** didn't you buy any gas this morning? — Because I didn't have any money.
4. **Why** didn't you have any money? — Because I lost it all last night in a poker game.
5. **Why** did you lose money in last night's poker game? — Because I'm not very good at poker.

Example Two
Problem: The Washington Monument is disintegrating.

1. **Why** is the Monument disintegrating? — Because of the use of harsh chemicals.
2. **Why** are harsh chemicals being used? — To clean pigeon poop.
3. **Why** are there so many pigeons? — They eat spiders, and there are a lot of spiders on the Monument.
4. **Why** so many spiders? — They eat gnats and there are lots of gnats at the Monument.
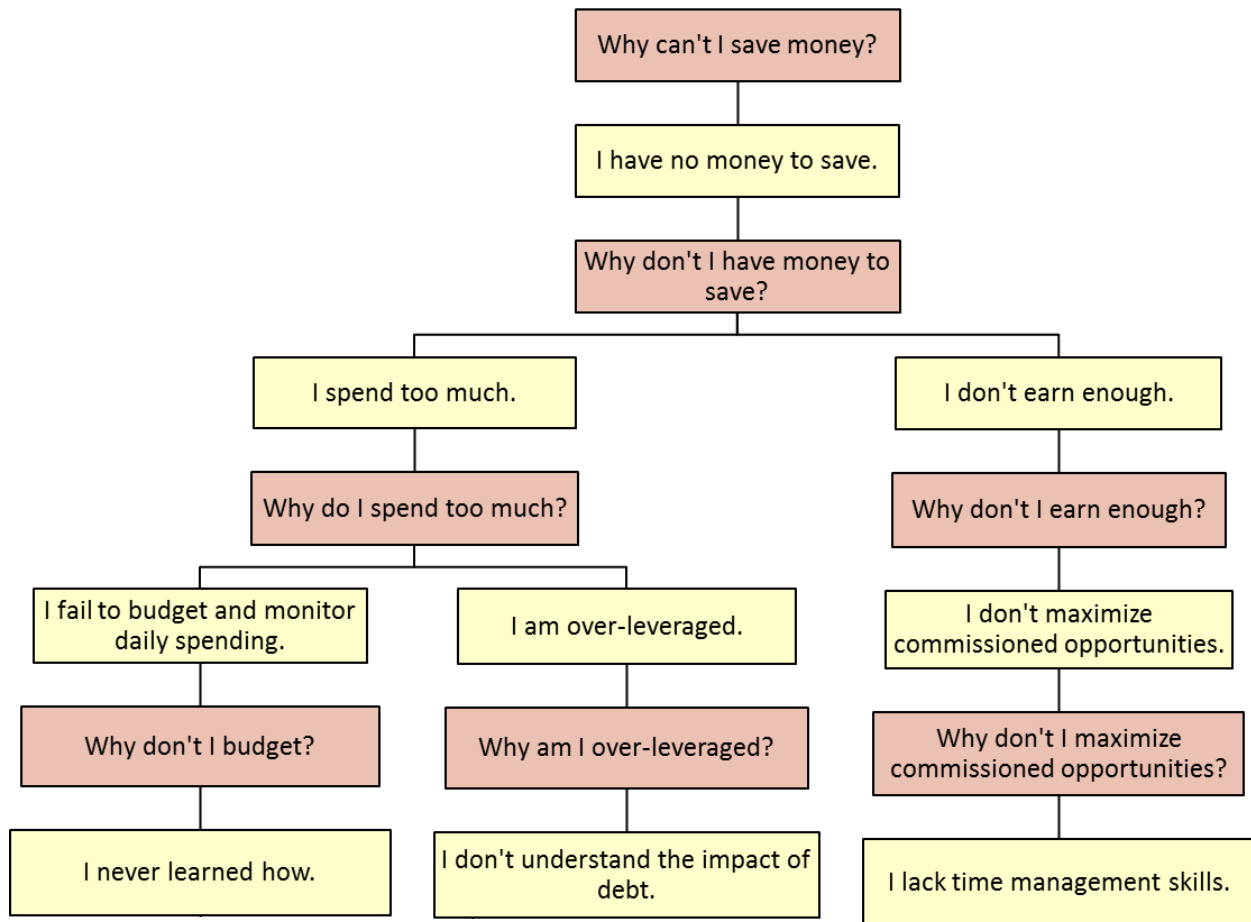5. **Why** so many gnats? — They are attracted to the light at dusk.

Solution: Turn on the lights at a later time.

Real Life:

Problem: It takes hours to fill a TANF (Temporary Assistance for Needy Families) application.

1. **Why** does it take so long? — Because the TANF application is long and applicants are distracted by their children.
2. **Why** are applicants distracted by their children while filling out the application? — Because there is no place for children in the room and the children sit with their parents.
3. **Why** are their children with them during the application process? — Because they may not be able to afford a babysitter.
4. **Why** can't they afford a babysitter? — Because they are in need of TANF.

Solution: Provide babysitting service to TANF applicants. This simple solution resulted in a reduction in the application time.

Why can't I save money?

I have no money to save.

Why don't I have money to save?

I spend too much.

Why do I spend too much?

I fail to budget and monitor daily spending.

Why don't I budget?

I never learned how.

I am over-leveraged.

Why am I over-leveraged?

I don't understand the impact of debt.

I don't earn enough.

Why don't I earn enough?

I don't maximize commissioned opportunities.

Why don't I maximize commissioned opportunities?

I lack time management skills.

A **5 Whys** tree can be used to explore multiple Whys. There could be numerous pathways to explore the reasons or causes to why a problem occurred — this tool can help visualize these multiple root causes.

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Overview:

Takt Time is the maximum amount of time in which a product needs to be produced in order to satisfy customer demand. It can be calculated by taking the total number of hours an employee works, subtracting any breaks or meetings, and dividing that time by the customer's demand. *The result is usually expressed in seconds.*

How to calculate Takt Time:

$$\text{Takt Time} = \frac{\text{Time Available to Work}}{\text{Customer Demand}}$$

- If employees work 8-hour shifts with a 30-minute lunch break and two 10-minute breaks, total work time is calculated at 430 minutes per day.
- **Breakdown:** 8 hours – 30 minute lunch – 2 (10min) breaks = 430 available minutes
  - ➢ If customer demand is 250 applications to be processed per day, takt time is available minutes divided by applications (output).
  - ➢ **Breakdown:** 430 available minutes / 250 applications = 1.72 minutes, which is converted to seconds.
  - ➢ **Breakdown:** 1.72 minutes x 60 seconds = 103.2 seconds. *Hint: Always round to the highest whole number. In this equation, the takt time would be 104 seconds.*
- As a general rule, optimal performance is 85% of takt time, so in this case, 89 seconds.
  - ➢ 85% is used to account for unexpected events which may occur (i.e. machine downtime, defective inputs, material shortages, rework, etc.)
  - ➢ 104. 0.85 = 88.4 seconds. *Hint: Always round to the highest whole number, 89.*
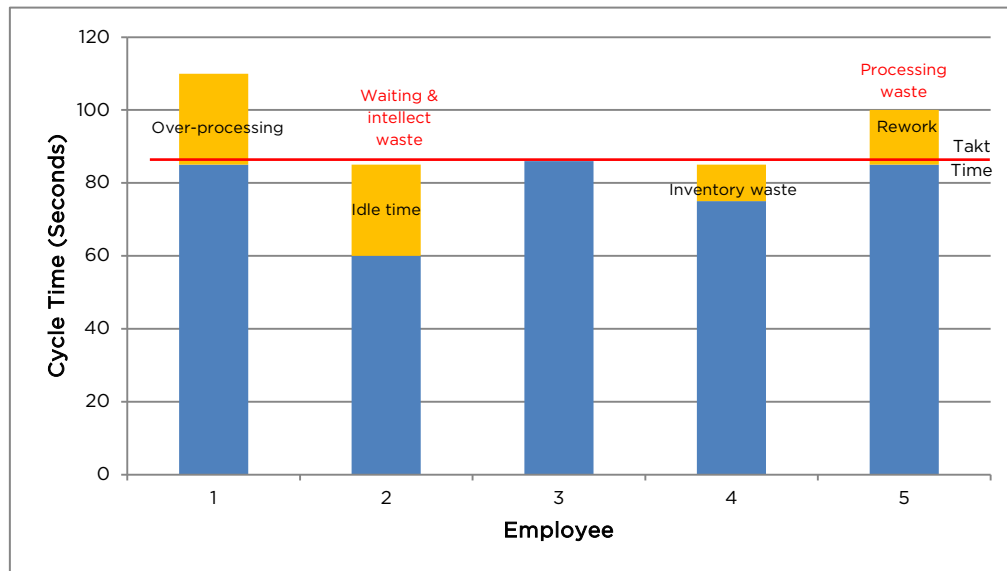
The Takt Time graph displays Employee 3 at 89 seconds which is approximately 85% of takt time and thus at optimal performance. Employees below 85% of takt time fall into areas of waiting, inventory, and intellect waste and those employees above takt time fall into the area of processing waste. In order to avoid waste, redistribute tasks to 85% of takt time. This process of redistributing workload based on customer demand is level loading.
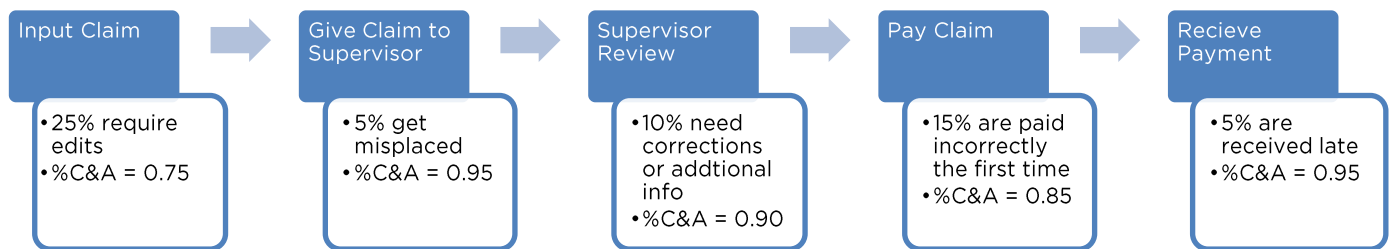
Overview:

Rolling First-Time Yield (aka Rolling Throughout Yield or First-Pass Yield) calculates how frequently a product or service is completed without any rework or re-handling done during the process. This frequency is presented as a percent of total occurrences. Rolling First-Time Yield (RFTY) indicates the efficiency of a process and can be used for identifying improvement opportunities within a process.

How to calculate RFTY:

For each process step, calculate the percent of occurrences that are completed accurately; that is, the percent of occurrences that are completed without additional corrections, requests for missing information, and without any other defects (i.e. delays). Let's call this the *Percent Complete & Accurate (%C&A)*. RFTY is computed by multiplying together the %C&A for each step of the process.

Example

Input Claim	Give Claim to Supervisor	Supervisor Review	Pay Claim	Recieve Payment
• 25% require edits • %C&A = 0.75	• 5% get misplaced • %C&A = 0.95	• 10% need corrections or addtional info • %C&A = 0.90	• 15% are paid incorrectly the first time • %C&A = 0.85	• 5% are received late • %C&A = 0.95

The Rolling First-Time Yield = 0.75 * 0.95 * 0.90 * 0.85 * 0.95 = 0.5178

In this case, 51.78% of claims entered in this process are completed without additional rework, delays, or other defects.