

How to Use a Fishbone Diagram

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Our Expert: Elisabeth

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- **Born in the UK**



How to Interact

- Ask a question
- Answer polls

QuickPoll

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Today's Agenda

- What is a Fishbone (aka Cause & Effect or Ishikawa) Diagram?
- Why and when should we use a Fishbone Diagram?
- What's the right way to build a Fishbone Diagram?
- Are there any ways not to use a Fishbone Diagram?
- What do “proper” Fishbones look like?



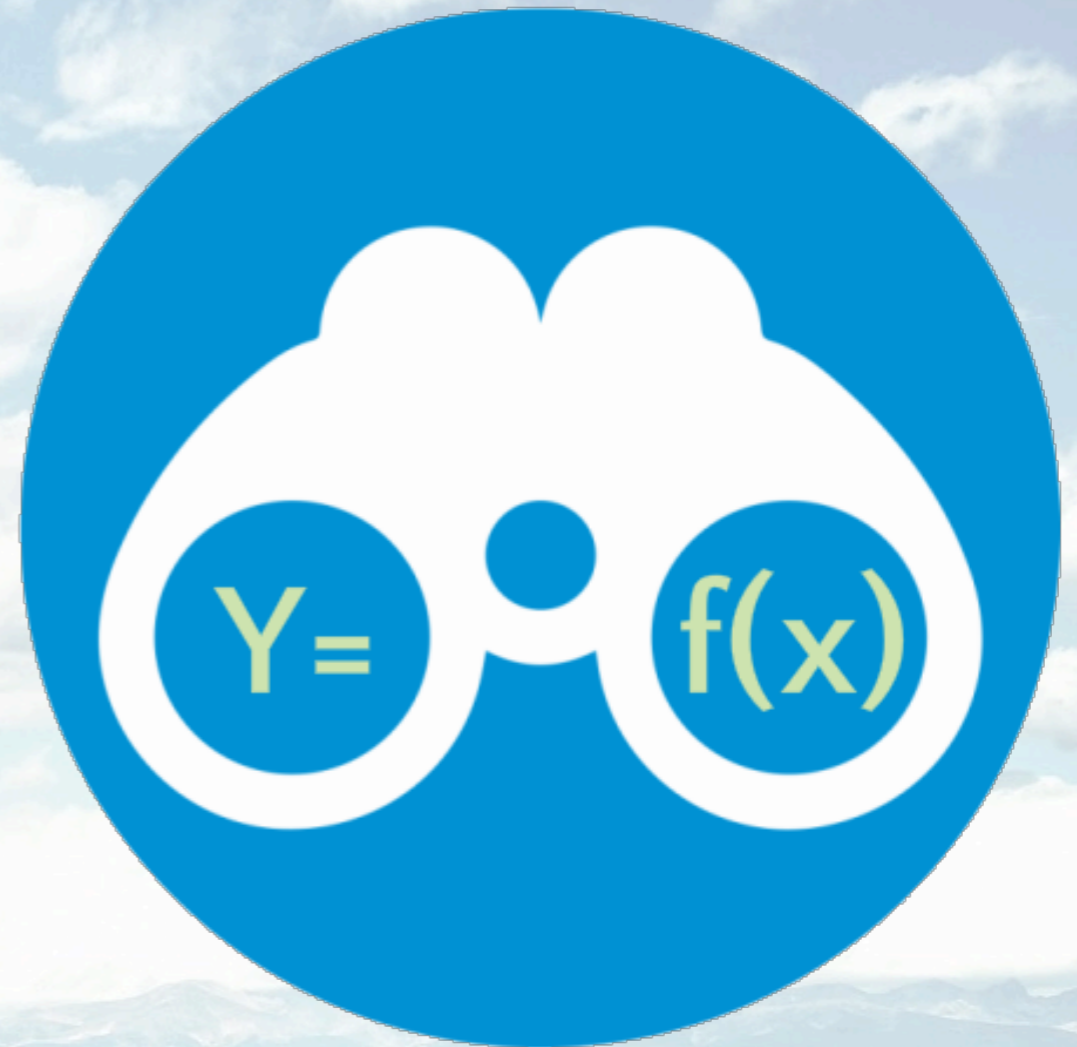
The “Y” and the “X”

The Y

- Y
- Dependent
- Output
- Effect
- Symptom
- Monitor
- Garbage Out

The X

- X_1, X_2, \dots
- Independent
- Input
- Cause
- Problem
- Control
- Garbage In



Pseudo Equation

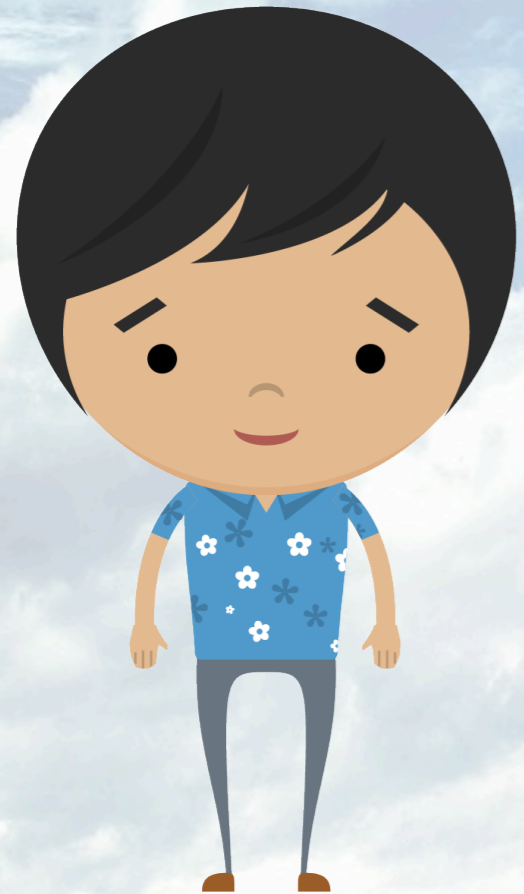


$$Y = f(x_1, x_2 \dots x_n)$$

?



Y and X at Bahama Bistro



Customer Satisfaction

Y

X

Speed of Service

X

Menu Item Availability



Food Freshness

X

Order Accuracy

X

X

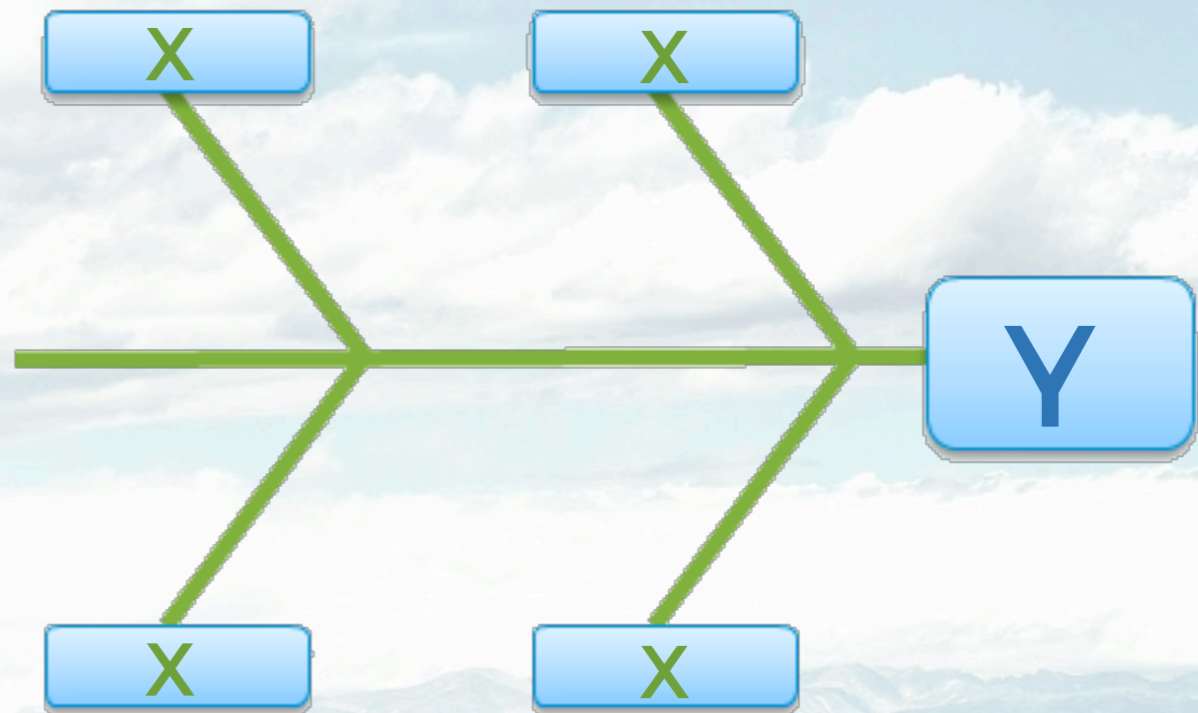
Ambience



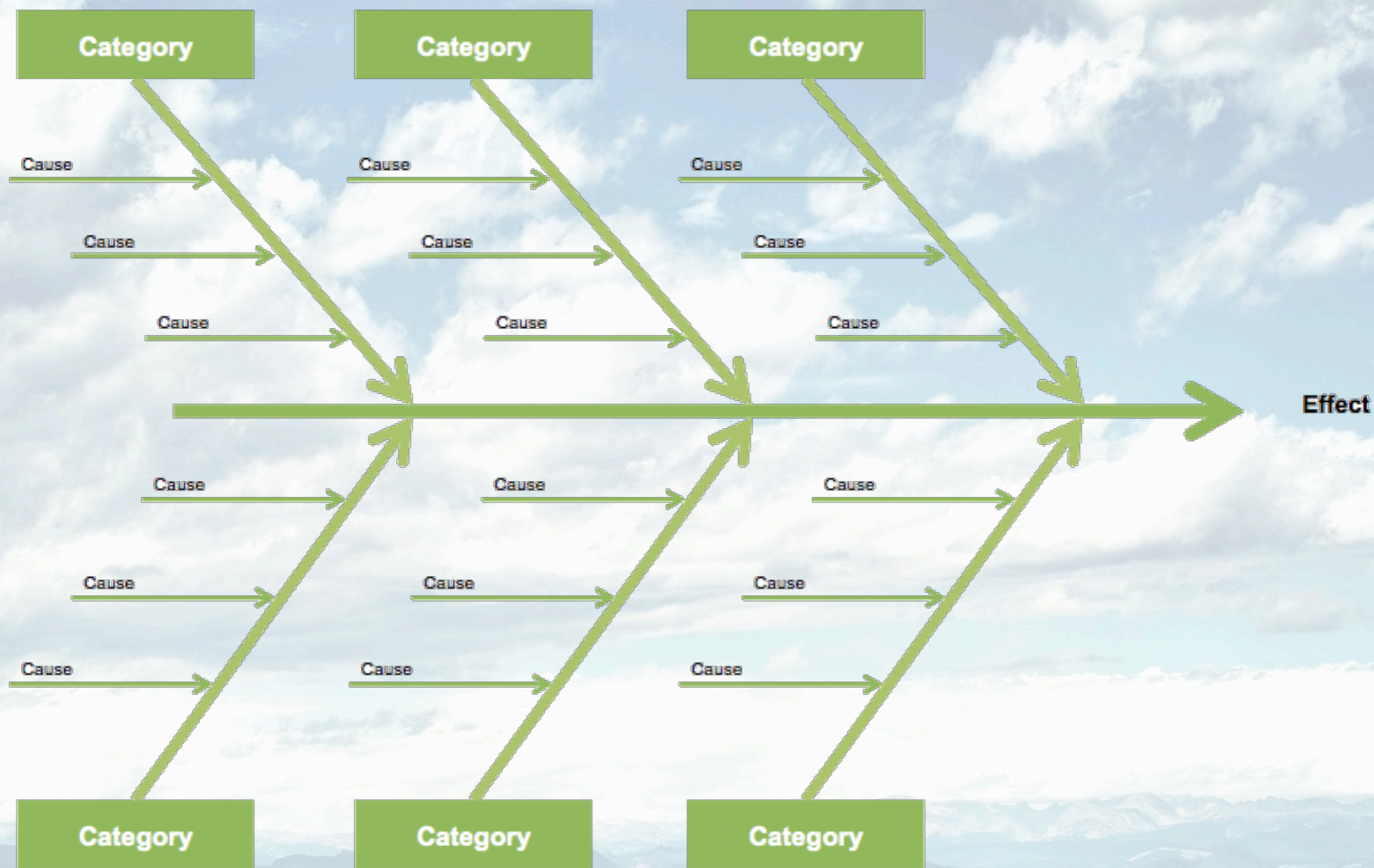
What Is a Fishbone Diagram?

Fishbone Diagram: aka “Ishikawa” or “Cause & Effect” is a method of structured brainstorming to get to root cause

- Conducted in groups
- Uses categories
- Uses hierarchy



Fishbone Diagram



Poll #1:

What's your experience with Fishbone Diagrams?

- A. Totally new to me
- B. I use them but not sure I'm using them effectively
- C. I know about them but don't use them
- D. I use them all the time - great tools



How to Construct

Issue or “Y” in “Fish Head”

Two methods:

1. Pre-Label Fishbones
 - Transactional Categories
 - Manufacturing Categories
2. Brainstorm and affinitize root causes into categories that are process specific
 - Groupings become “Fishbone” labels



1. Pre-Label

Advantages

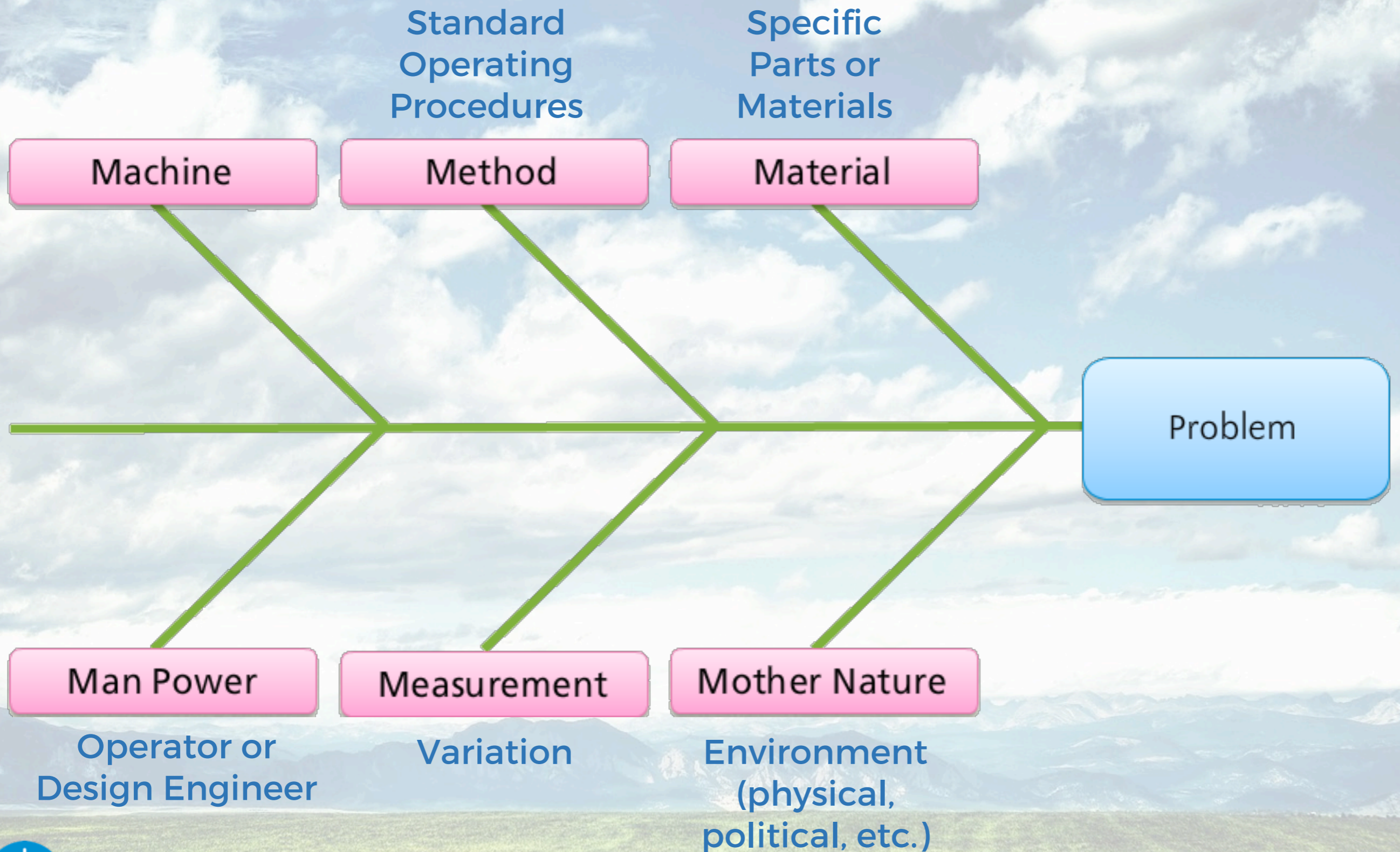
- Easy to set up
- Causes unexpected ideas
- Does not require upfront work
- Can combine with brainstormed categories

Disadvantages

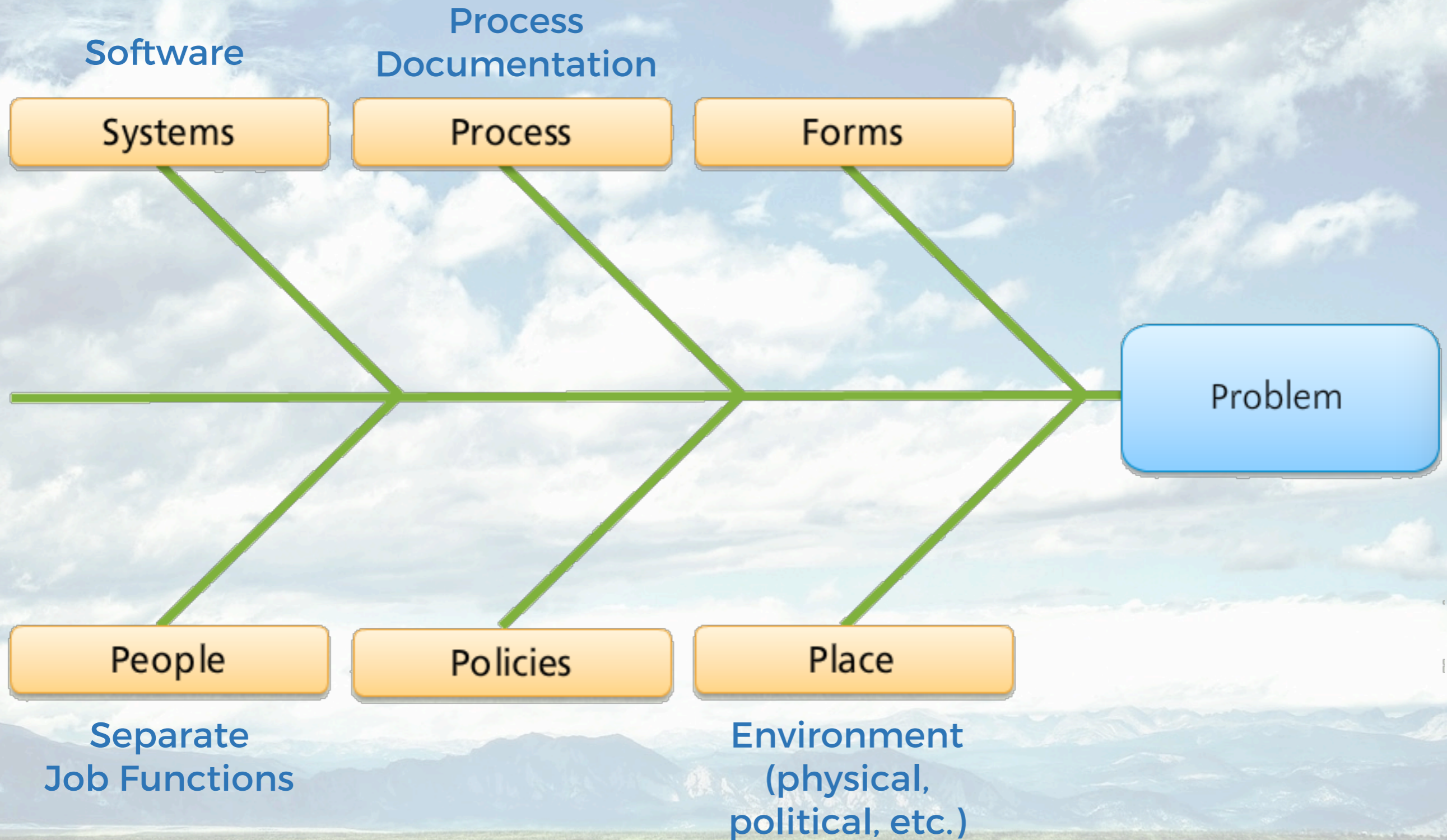
- Limits ideas
- Not focused on the process



Manufacturing Categories



Transactional Categories



2. Affinity Analysis

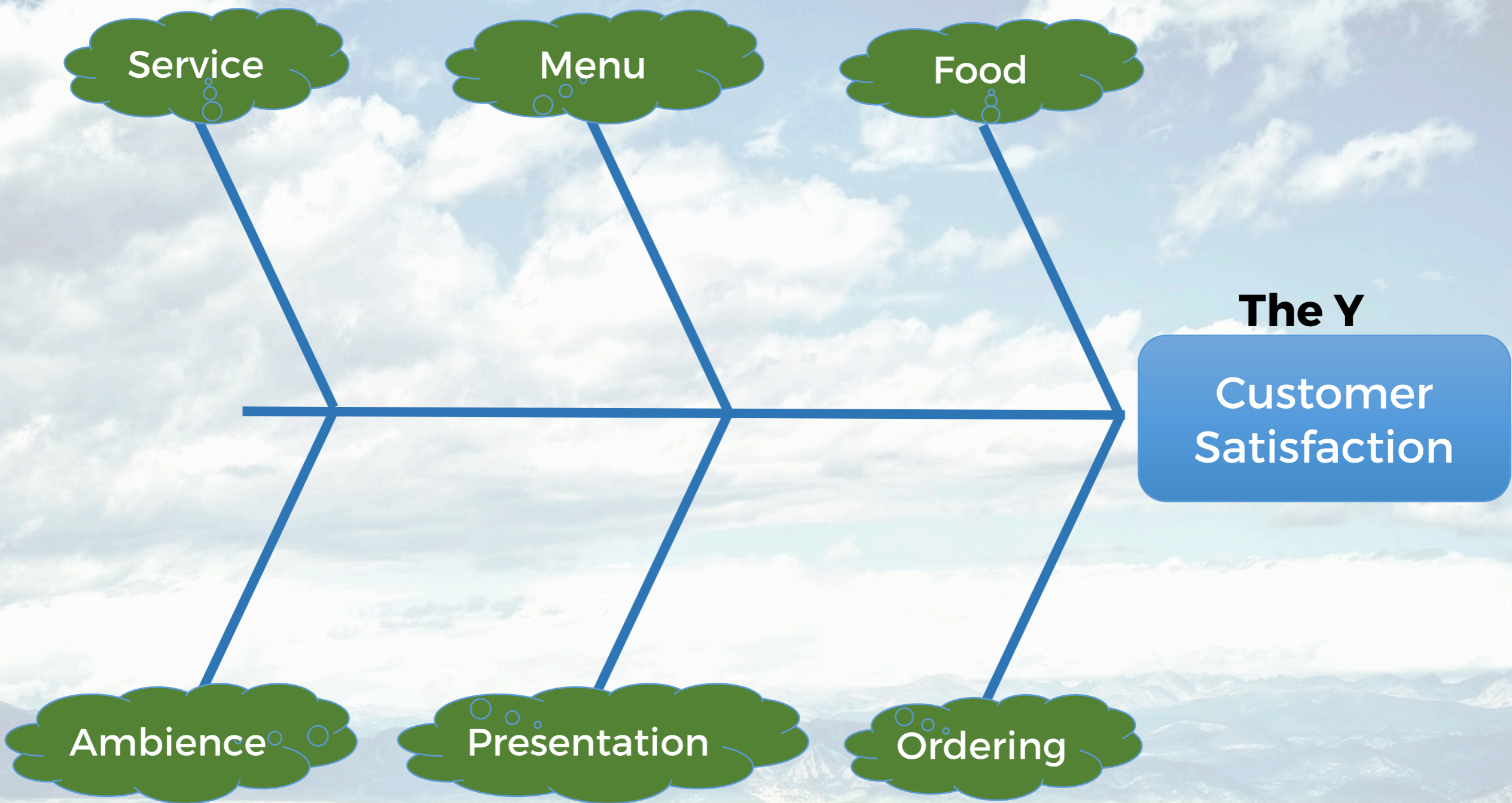
- More focused on specific process
- Organic
- Involves group
- Good to practice Affinity Analysis – generic organizational technique



Brainstorming



Fishbone Diagram



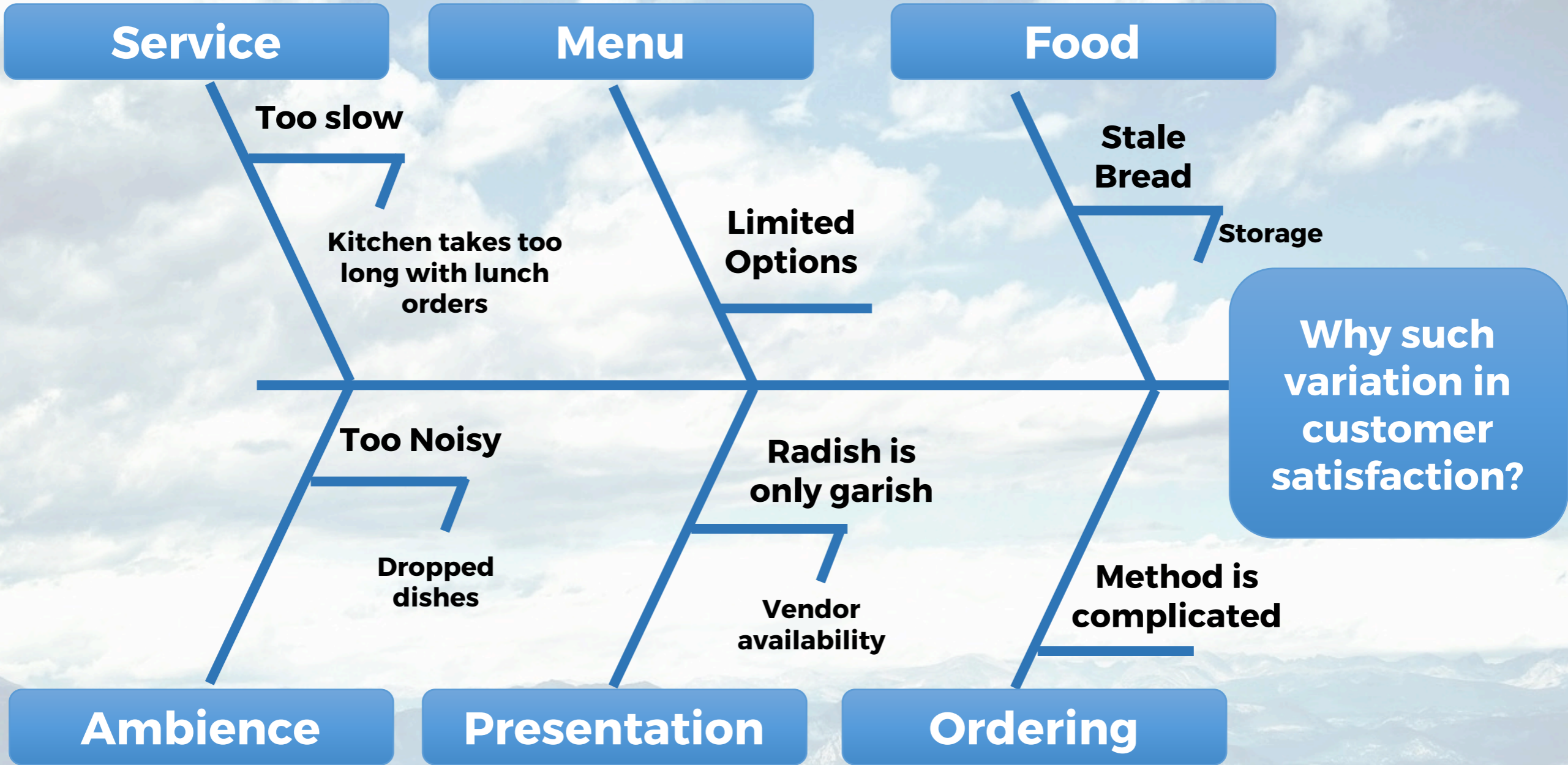
Poll #2:

Which method do you use to build the Fishbone Diagram?

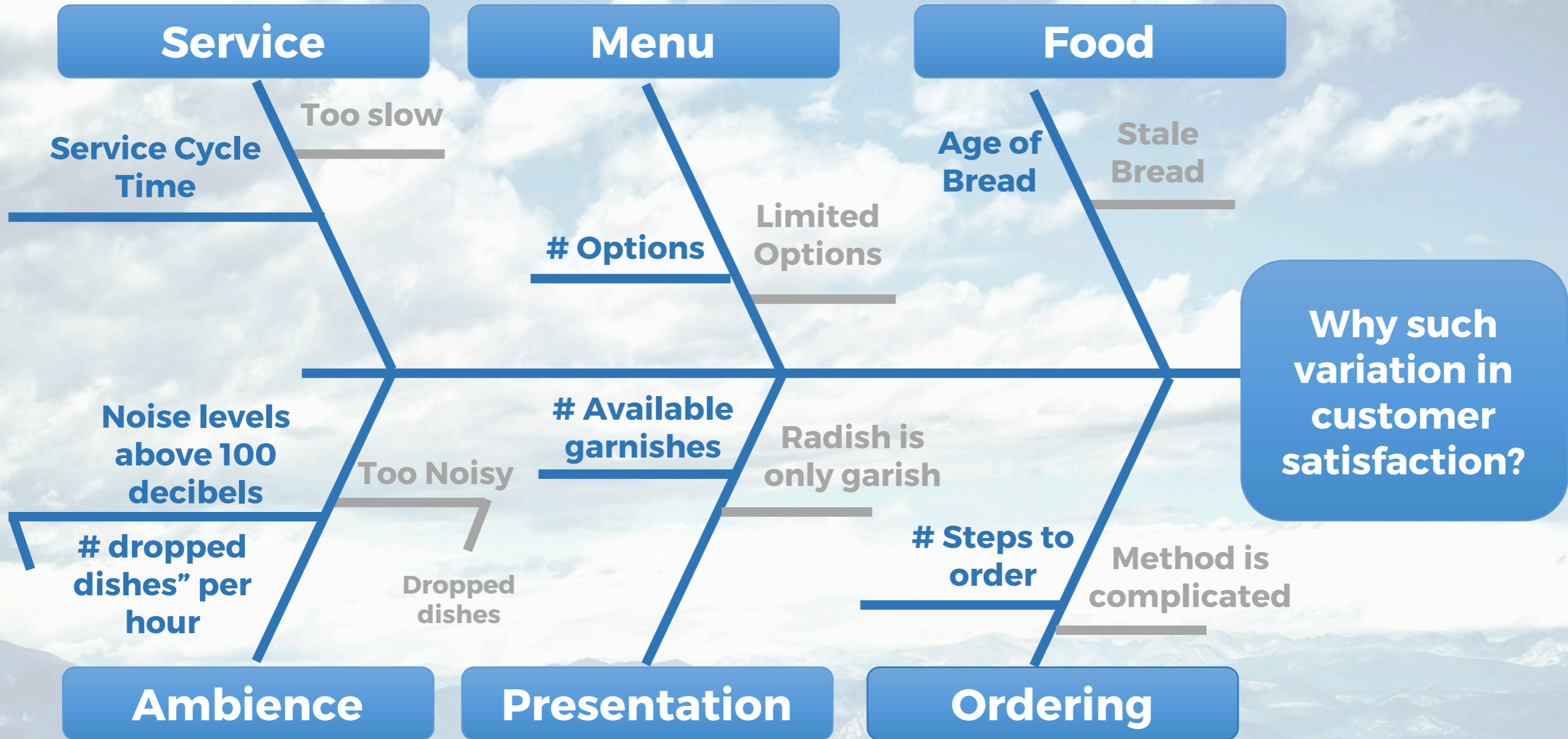
- A. I use the standard Manufacturing or Transactional labels
- B. I brainstorm and affinitize categories first
- C. I just pick labels that seem appropriate given the issue
- D. None of the above



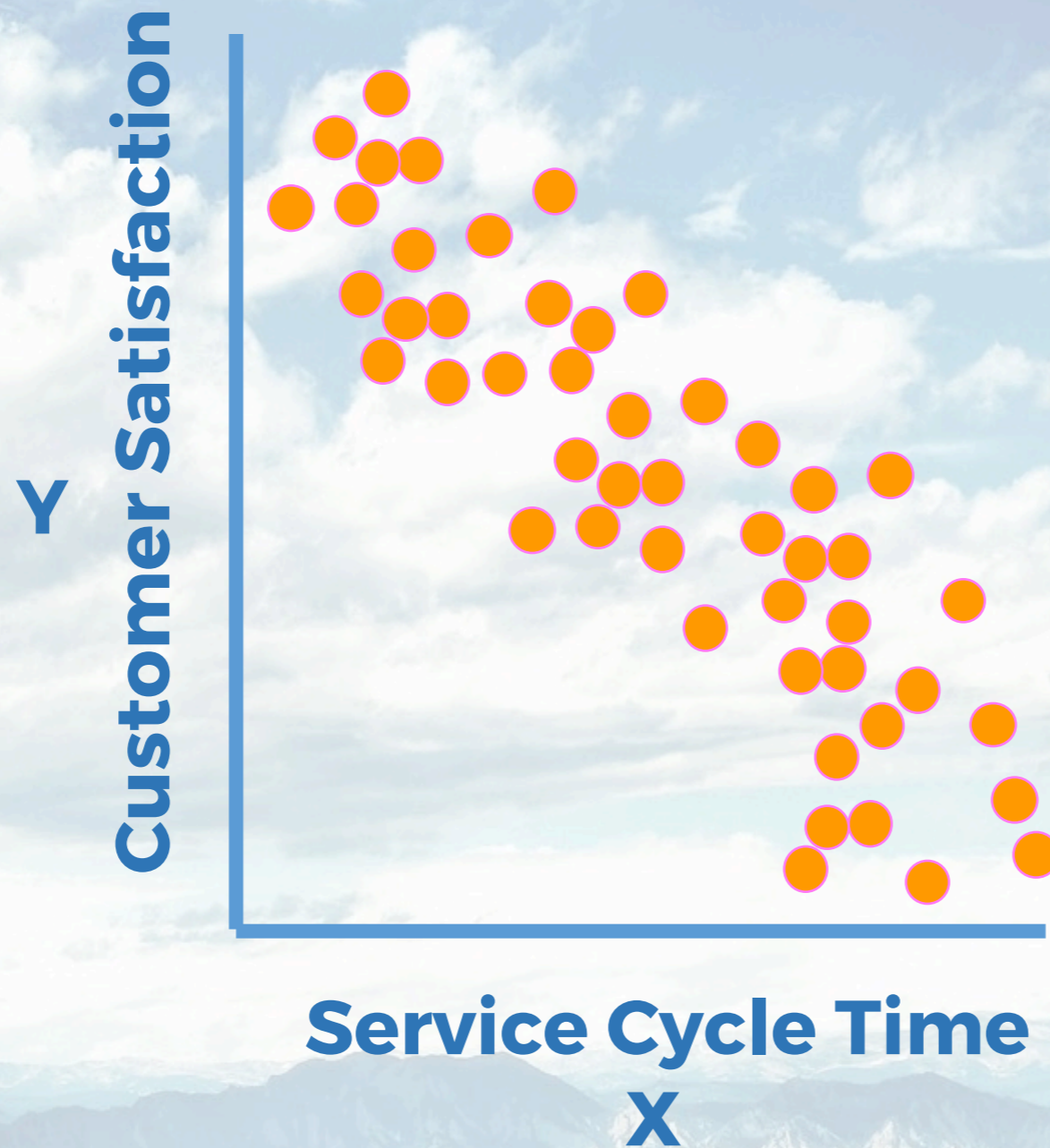
Fishbone Diagram Example



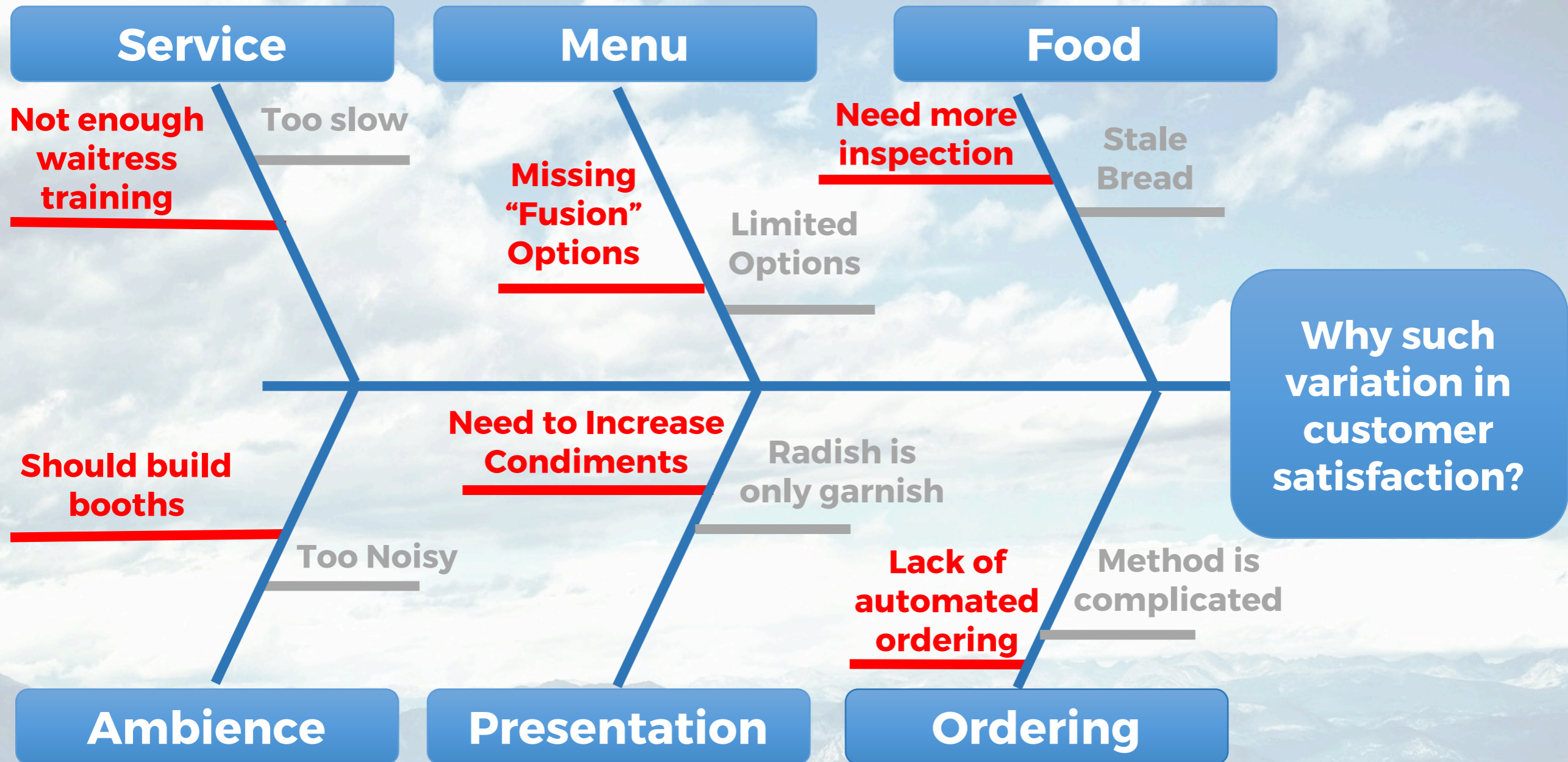
Turn Into Measures



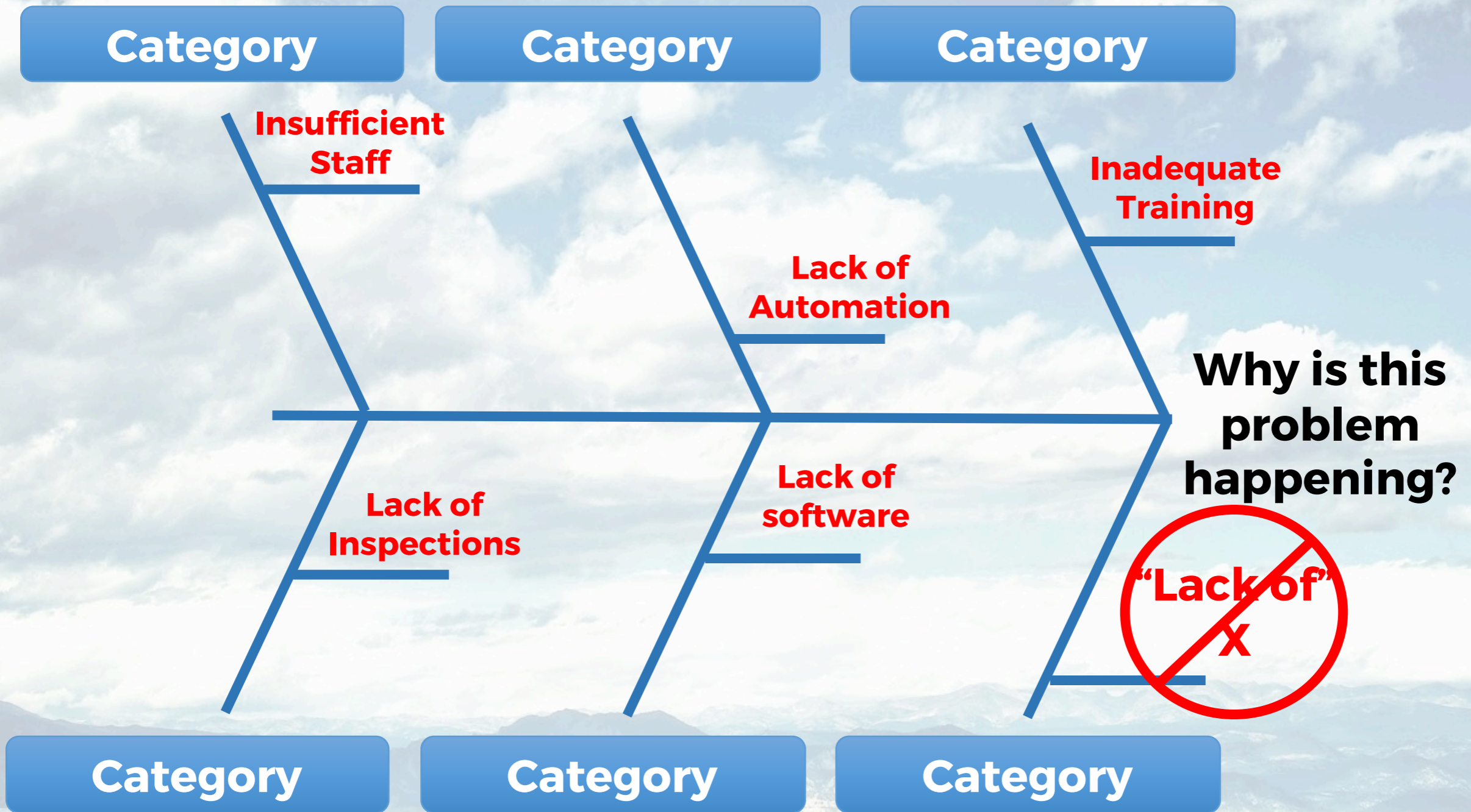
Looking for Correlation



Caution: Solutions Masquerading...



Fishbone Trap



Solutions → Measurable Causes

- Lack of training → Level of operator knowledge
- Procedure not followed → % of time procedure followed
- Inadequate staffing → # of man hours utilized
- Lack of inspection → % returned meals



Level of Training

- Run by teenagers
- Assume turnover
- Build processes with visual management
- Low need for training

That's fine for fast food, but at the Bahama Bistro we make kitchen magic!



Number of Inspections

- Add time (waste)
- Cause delays
- Initiated by failures
- Provide false sense of security
- Never removed

“We *inspect*
because we *expect*
a *defect*”



Automation Myths

Myth 1: No need to address this issue now –
Software “X” is *coming*

Myth 2: Software “X” will solve the process issue

Myth 3: Automation will streamline the process



Solution Parking Lot

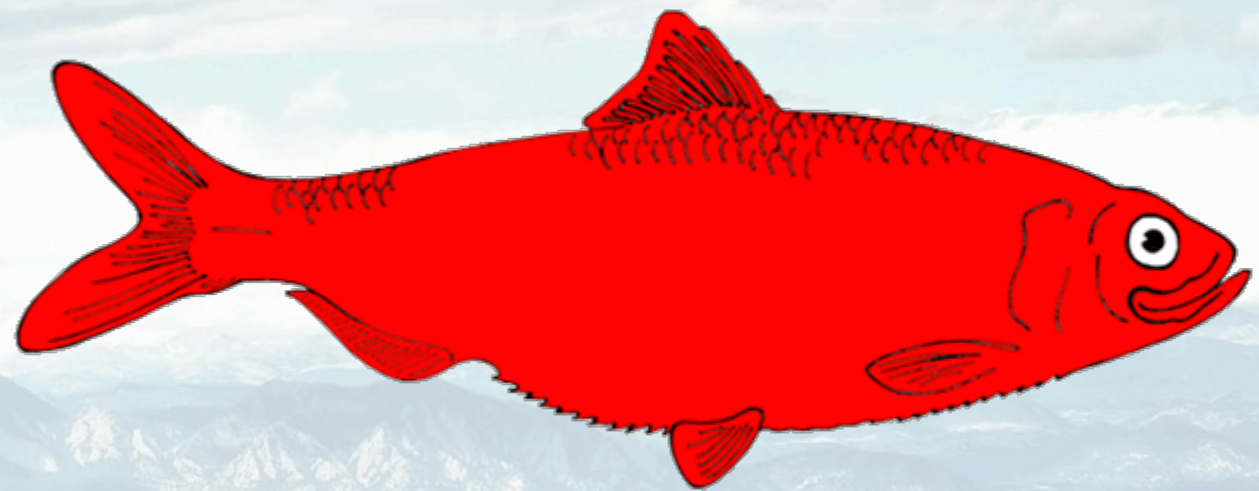
Solutions

- Have Joey do everything
- Outsource the cooking
- Get rid of Marketing
- Close early
- Switch to Italian food

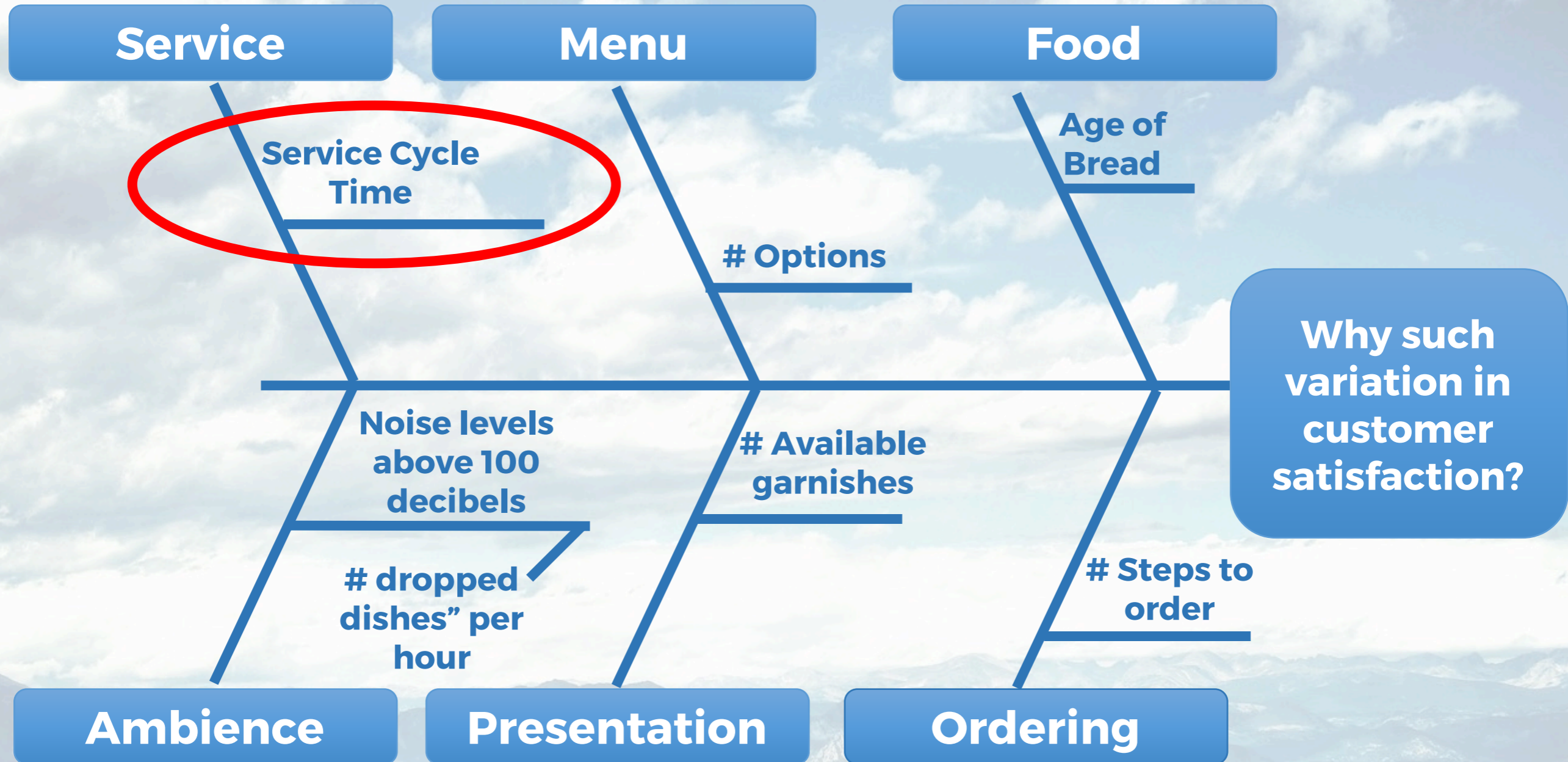


“Red Herring” Root Causes

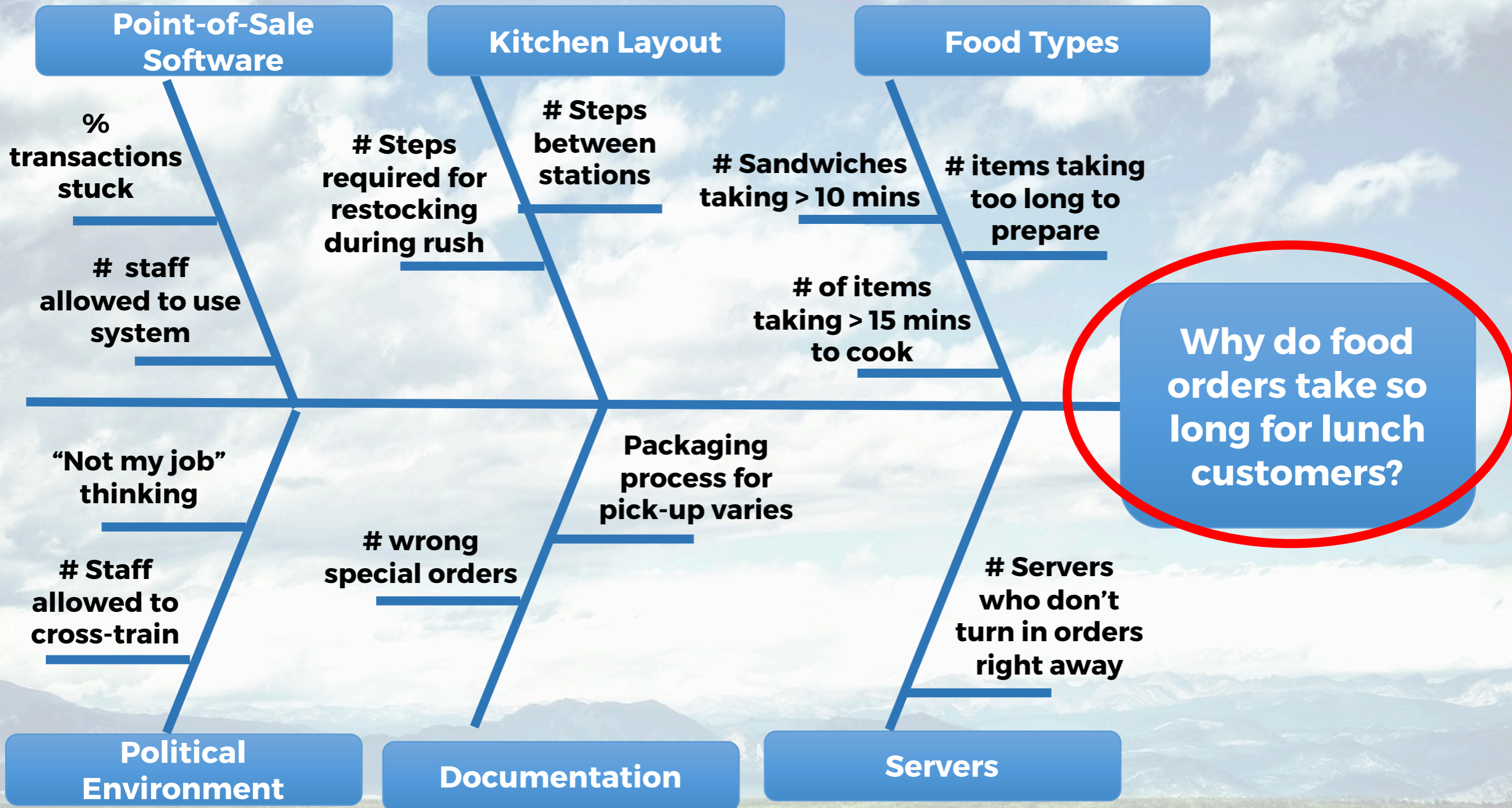
- Beware of solutions masquerading as problems
 - Key phrases: “Lack of...”, “Insufficient...”, “Inadequate...”
- Don’t assume training is the issue
 - Is process too complicated?
- Clean up process before automating



One Fishbone Leads to Another...



New Fishbone Diagram



The Five Whys

- Repeatedly ask “Why”
- Work the causal chain
- Done by those in the process
- Could be more or less than 5 “Whys”

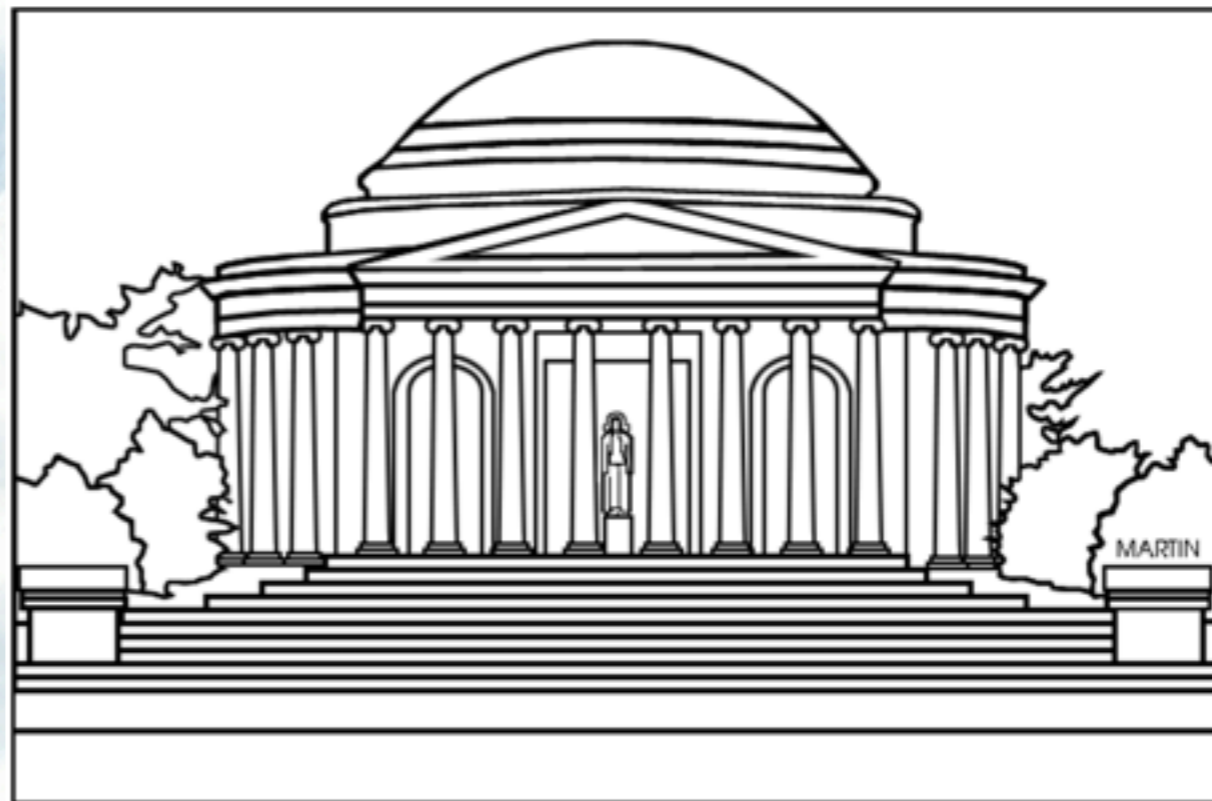
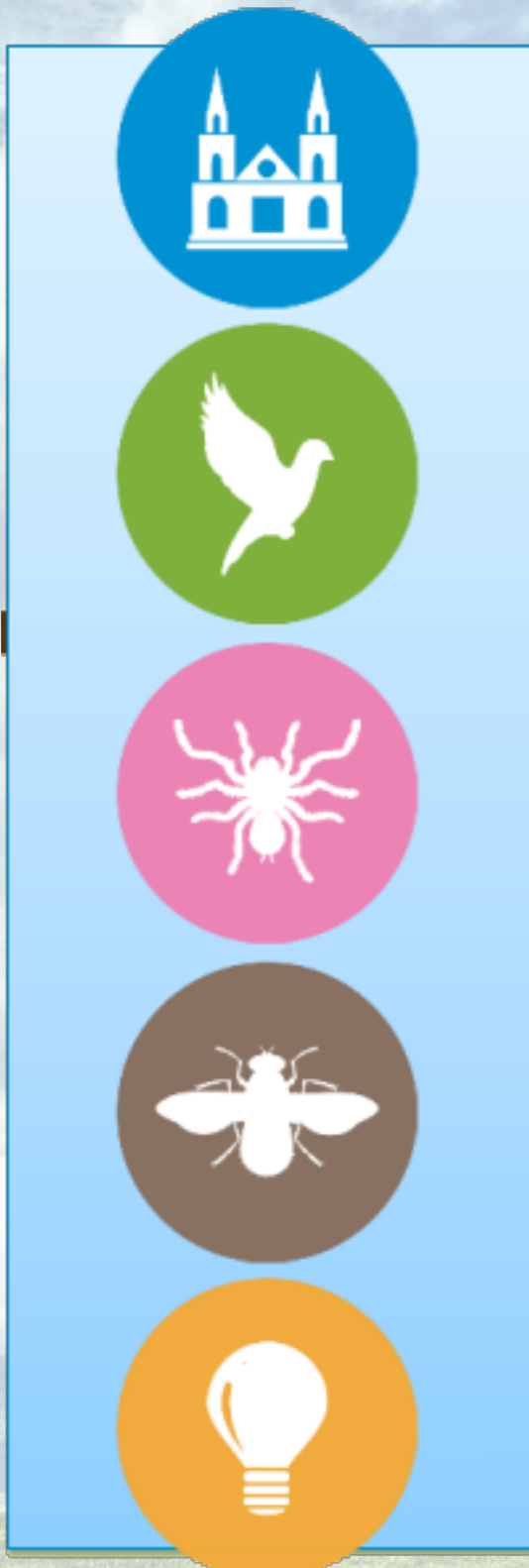
Did someone teach this technique to my child?

Benefits:

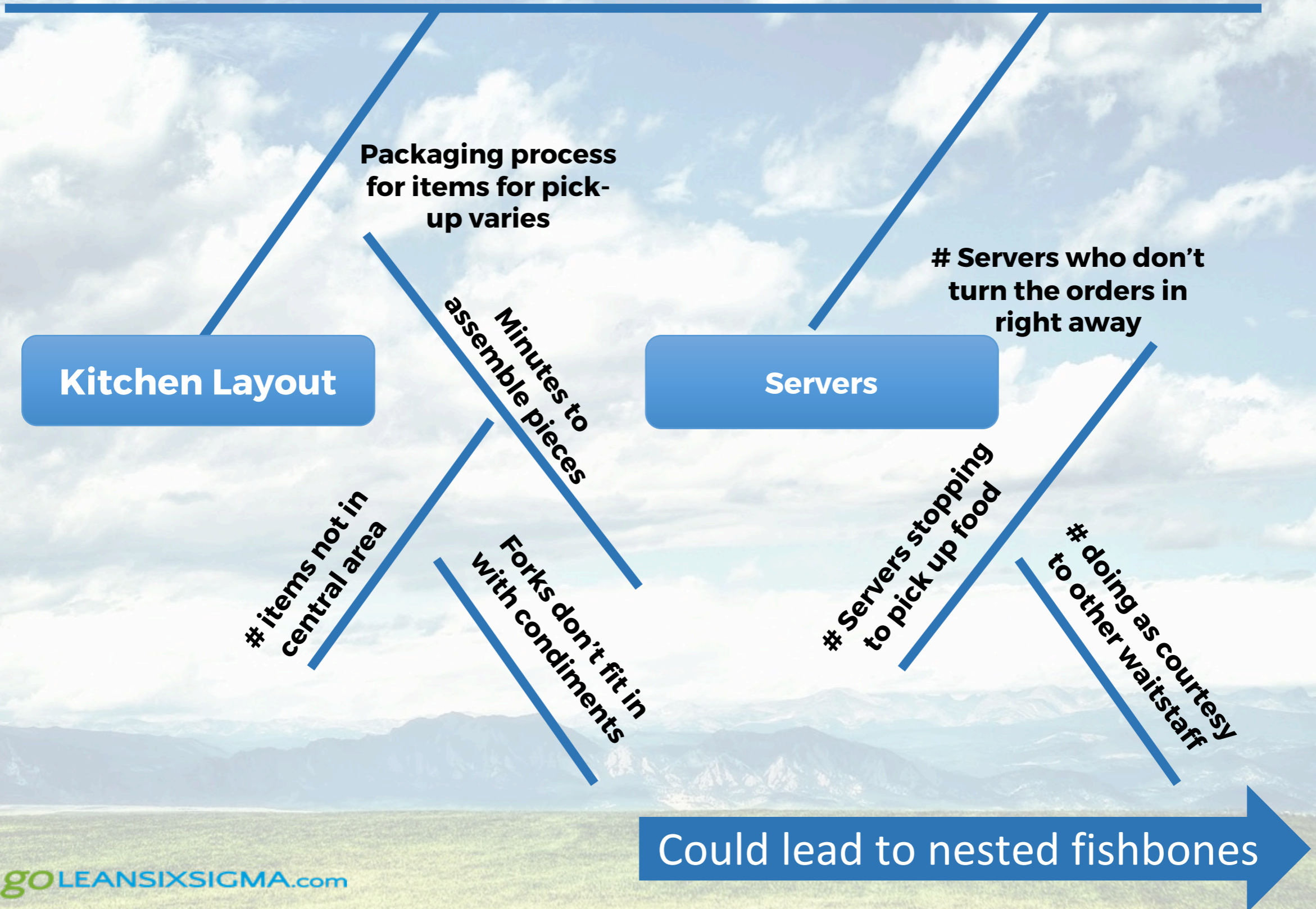
- Simple – no stats
- Get past symptoms
- Good for processes involving human factors



Five Whys Example



Fishbone and Five Whys



Five Whys Template

5 Whys

Why 1		Why 2		Why 3		Why 4		Why 5	
Why?	Because	Why?	Because	Why?	Because	Why?	Because	Why?	Because
Why do food orders take so long to deliver to the customer?	Because some of the prep takes too long	Why does prep take too long?	Because sometimes chefs have to restock supplies and wash dishes in the middle of the rush	Why does the chef have to restock and wash dishes?	Because we run out of both	Why do we run out of ingredients and dishes?	Because we don't have enough ingredients prepped and we don't have enough dishes	Why do we not have enough prepped ingredients or enough dishes?	Because we never know how many orders to plan for



Multi-Voting

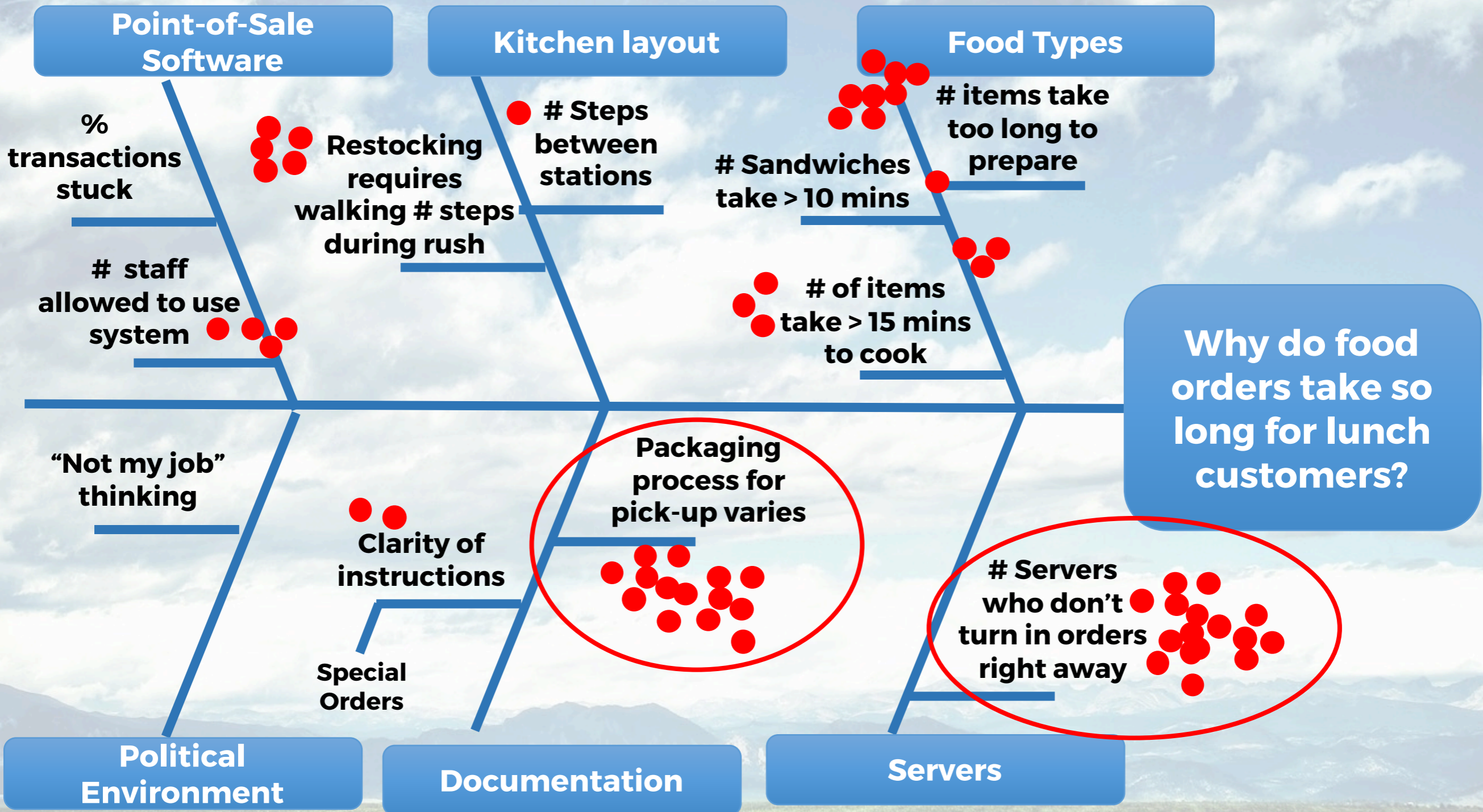
- Count the number of options
 - Root causes
 - Solutions
 - Customer Comments
- Divide by 3
- Hand out $N/3$ Dots to each person
- Narrow the list



Options

- It's Marketing's fault
- Lack of new software
- Not enough staff
- Need more inspection
- Need a new manager
- Need more money

Multi-Voting



Next Steps

- Fishbone is a structured brainstorming – ***not proof***
- Team decides where to focus
- Must create hypothesis statements
- Verification can take many forms
- Depends on the process and issue



Poll #3:

What's your experience with Fishbones "gone wrong"?

- A. They are populated with solutions
- B. They are not paired with the 5 Whys
- C. They are not verified
- D. Some combination of above
- E. None of the above - all good!



Validating Methods

Observe

- Watch the process and see the issue in action

Compare

- Where problem is/isn't

Use Data

- Caution

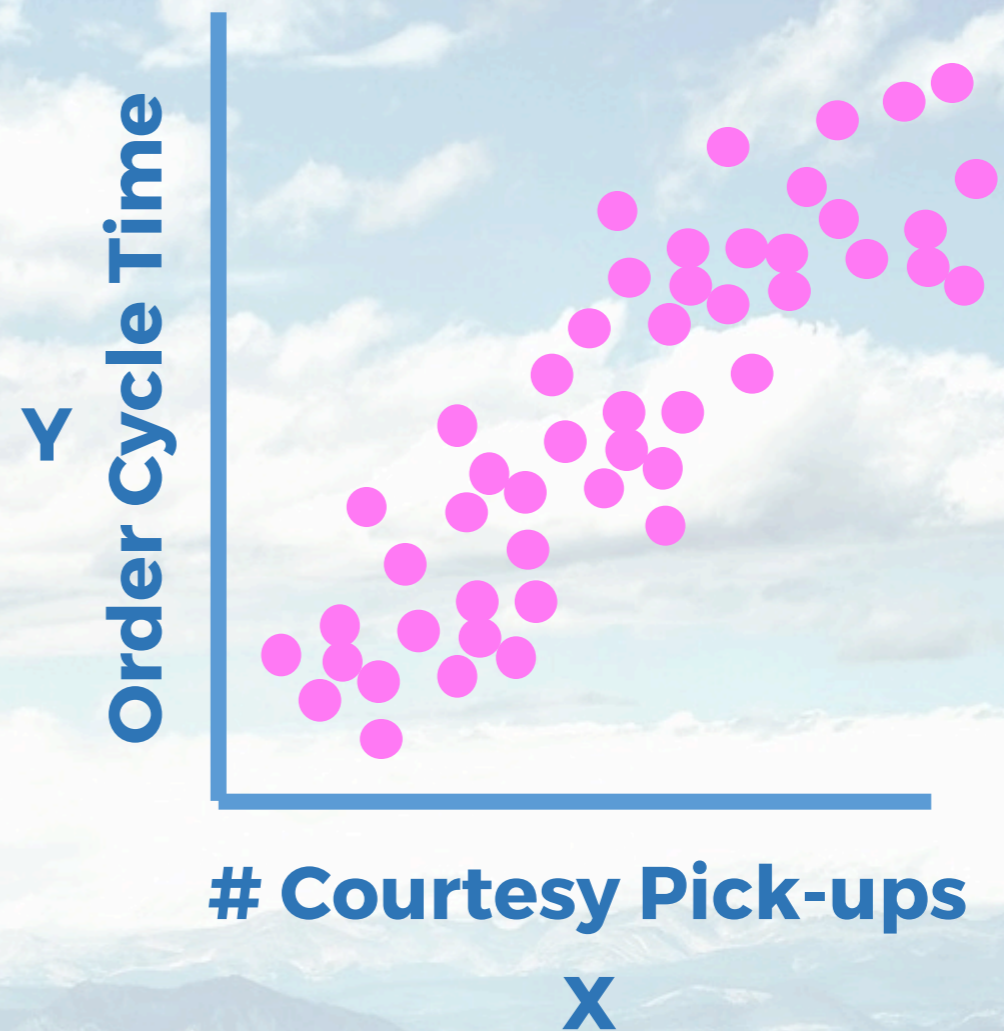
Use Stat Tools to Test Hypothesis

- Try to “disprove” the Null Hypothesis



Hypothesis & Data Example

Hypothesis: As number of waitress “courtesy” food pick ups increase, lunch order cycle time increases



Fishbone Review

Build the Fishbone

- Conduct in groups (not party of one) – more brains, more ownership
- Brainstorm and clarify labels (physical or political environment?)
- Populate the fishbone – bony is good – not limited to one page
- Don't worry about “where” a cause goes – as long as it's included
- Consider what causes process “variation” not just defective units
- Turn causes in to measures - set up for verification

Expand the Fishbone

- Use 5 Whys to dig past symptoms
- Watch for solutions masquerading as problems – use Solution Parking Lot
- Keep and update Fishbone – organizational knowledge

Verify the Fishbone

- Multi-vote and prioritize potential root causes to research
- Form hypothesis statements & and select verification method



Today We Covered

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Q&A



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- [Yellow Belt Training is FREE at GoLeanSixSigma.com](https://GoLeanSixSigma.com)
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Just-In-Time Podcast



The image shows a podcast cover for 'Just-In-Time CAFE'. The title 'The Joy of Lean' is prominently displayed in white text against a background of palm trees and a sunset sky. Below the title, it says 'With Dodd Starbird, Managing Partner at Implementation Partners'. Three circular headshots of the hosts are shown: Tracy O'Rourke, Dodd Starbird, and Elisabeth Swan. At the bottom, there is a pink arrow pointing right with the word 'PODCAST' and the website 'goLEANSIXSIGMA.com' with a lightbulb icon.

Just-In-Time CAFE

The Joy of Lean

With Dodd Starbird, Managing Partner at Implementation Partners

Tracy O'Rourke Dodd Starbird Elisabeth Swan

PODCAST

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Q&A



Thank you for joining us!

More Questions?

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