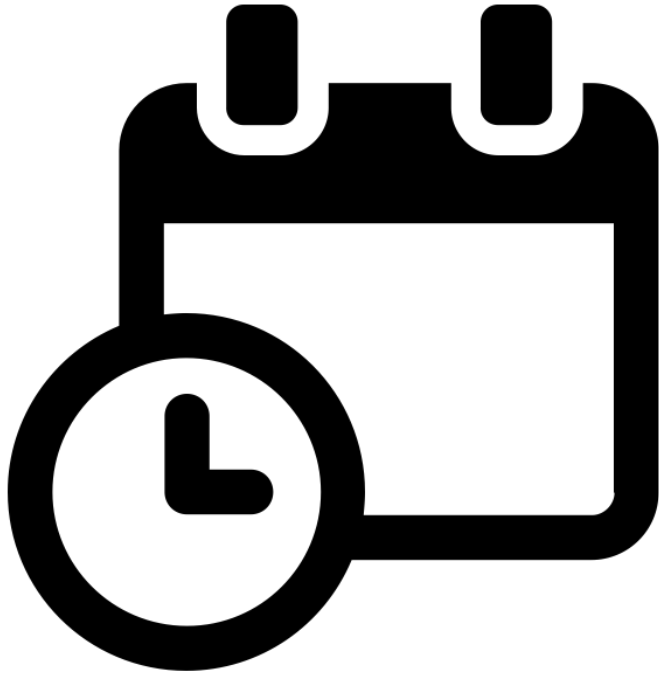




initiate | **investigate** | improve | implement

# Agenda

## Day 2



- ✓ Charter Check
- ✓ Goal: investigate
- ✓ Customer Perspective
- ✓ Lean Thinking
- ✓ Data

# Ground Rules



**Participate**

**Listen**

**Ask  
Questions**

**Acknowledge  
Others**

**Have fun**

**Open to  
feedback**

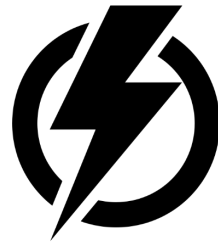
# Note on Icons



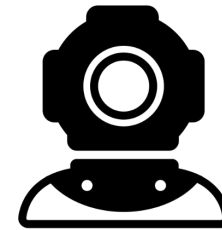
**Look in upper right corner**



Ask Questions  
or Share Ideas



Practice Your  
Skills



Dive Deep to  
Learn More



Review Case  
Study

# Charter Check



Get feedback on your charter.

## Problem Statement

- Presupposed Solution?
- Questions?
- Supported by metrics?
- Is it compelling? Does it specify impacts and justify resources?

## Scope

- Where does your process begin and end?
- What “flavors” of the process are you working on, not working on?

## Targeted Outcome

- Did the solutions sneak back in?
- Are they measurable whenever possible?

## Stakeholders

- Are all stakeholders identified?
- Are they aware of your project?
- Do you have buy-in and support for your project?





# Icebreaker

Think about a customer service experience you had when somebody went above and beyond to help you.



# investigate: What is the goal?

	GOAL	DELIVERABLES	ADDITIONAL TOOLS
investigate	<ol style="list-style-type: none"><li>1. Understand the current state</li><li>2. Understand the customer perspective</li><li>3. Verify the problem statement</li><li>4. Understand root causes of current state issues</li></ol>	<ol style="list-style-type: none"><li>1. Current State Map</li><li>2. Customer Perspective tool</li><li>3. Root Cause(s) Analysis tool</li></ol>	<p><b>Map Options:</b> </p> <ol style="list-style-type: none"><li>1. Process Map</li><li>2. The 8 Wastes</li><li>3. Value Analysis</li></ol> <p><b>Customer Perspective:</b></p> <ol style="list-style-type: none"><li>1. Empathy Map</li><li>2. Customer Profile</li></ol> <p><b>Root Cause Analysis Options:</b> </p> <ol style="list-style-type: none"><li>1. Cause(s) Map</li><li>2. The 5 Whys</li><li>3. Fishbone</li></ol>



The background image is a photograph of a hospital room, but with a large, semi-transparent blue overlay. In the background, a person is lying in a hospital bed, and a healthcare professional in a blue patterned uniform is leaning over them. A large ship's steering wheel is mounted on the wall behind the bed. To the left, there is medical equipment, including a white machine on a stand. The overall scene suggests a patient's perspective in a medical setting.

# Customer Perspective

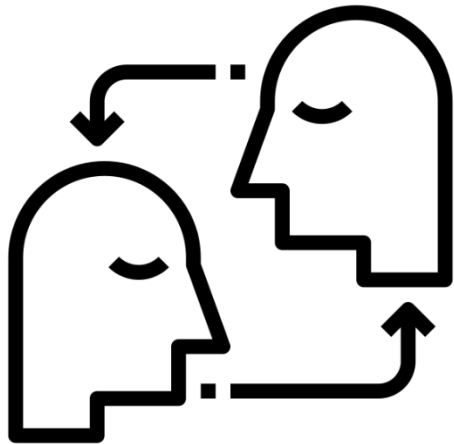
Observe and Develop Empathy for Your Customer



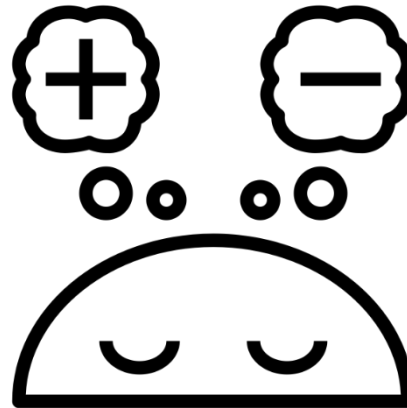
# Customer Perspective



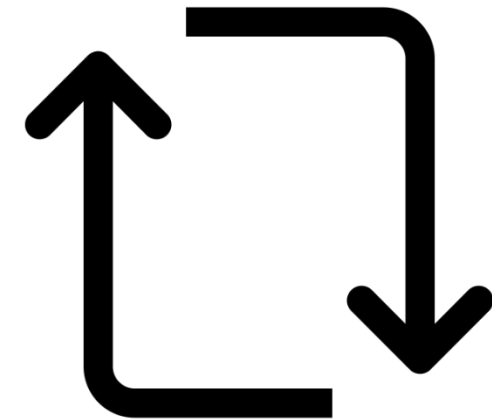
Customer perspective has 3 specific characteristics:



Empathy for the customer

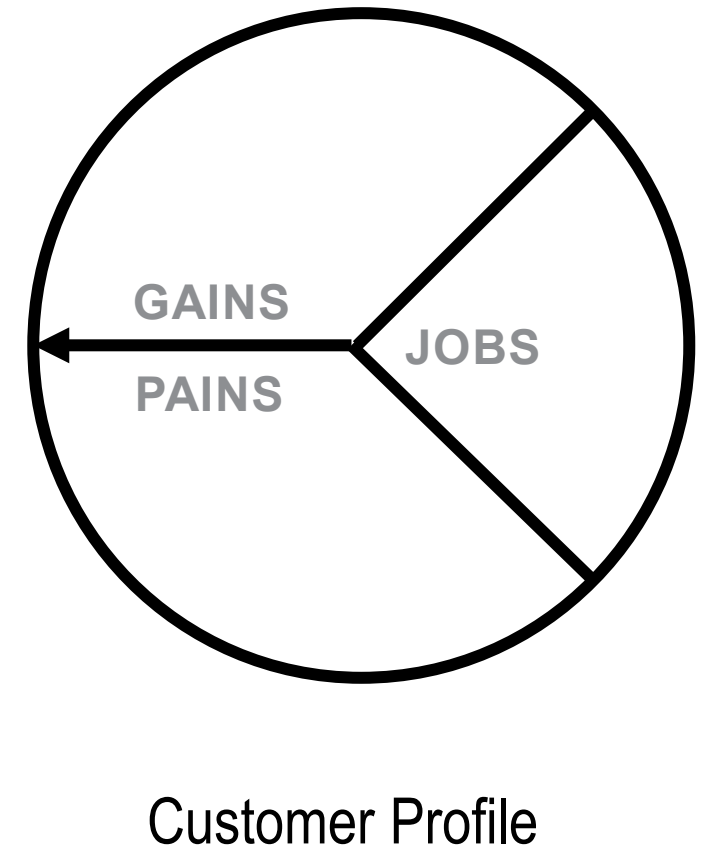
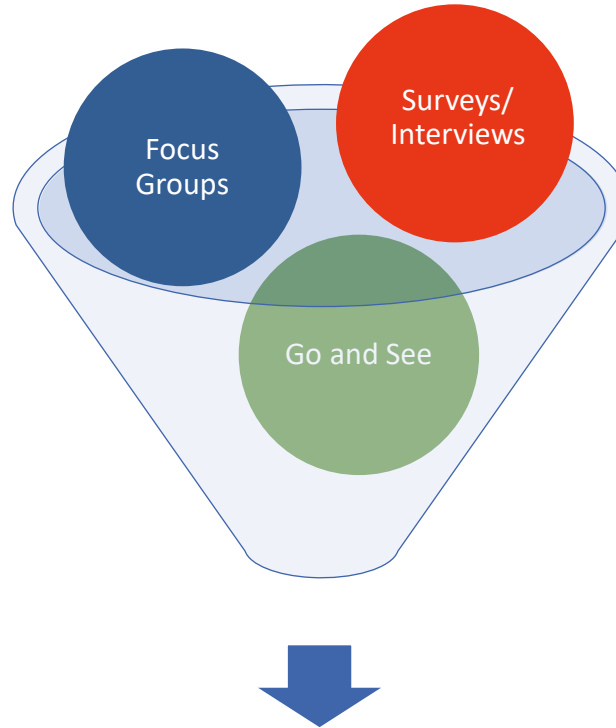


Tools for customer perspective



Iterative and experimental approach

# Customer Perspective Tools



A photograph of a long-haired dog, possibly a Shetland Sheepdog, lying down with its eyes closed, wearing large white over-ear headphones. A black smartphone is placed on the surface to the left of the dog, with a white cable connected to it. The entire image is overlaid with a semi-transparent blue filter.

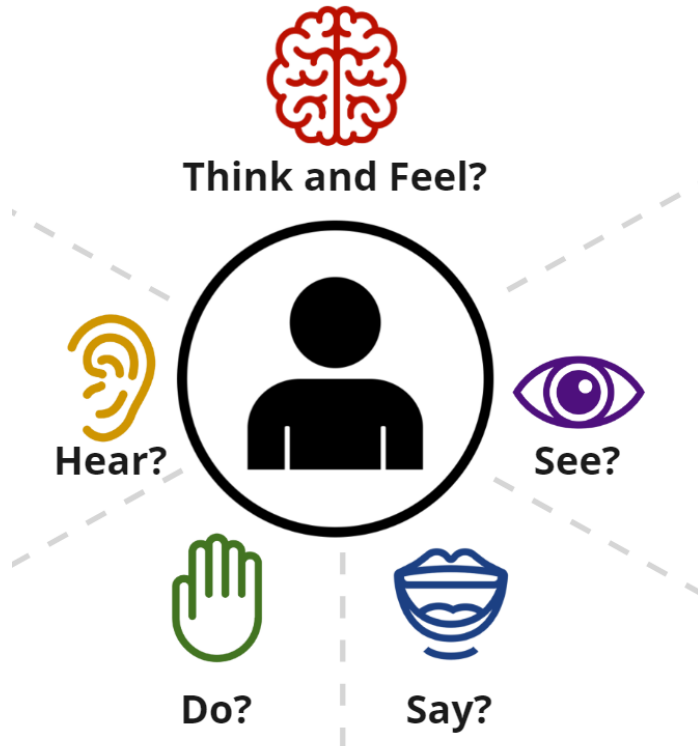
# BREAK TIME

Return in 15 minutes

# Empathy Map Exercise



Practice creating an empathy map.



Put yourself in the shoes of a young child experiencing an MRI for the first time. Write your ideas down then, share out:

- ✓ What do you think and feel?
- ✓ What do you hear, see do and say?
- ✓ Use workbook to capture ideas (4 minutes)
- ✓ Report out (6 minutes)





# Direct Feedback - Go and See (aka Gemba walk)



What did you observe?

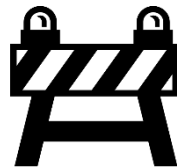
## Elements of a gemba walk



observe,  
but don't  
correct

identify  
value +/-  
activities

seek to  
understand  
or clarify



ask about  
challenge  
& barriers

1

What tools and systems were used?

2

What wasn't working?

3

What ended up working?

# Stakeholder Feedback

## Stakeholder Analysis

Who? (Stakeholder: Customers, Team)	Issues & Concerns (What do they care about/role?)	Strategy (How can you help them?)

## How Will You...

- Get feedback from various groups?
- Are additional team members needed?
- Are focus group or interviews necessary?
- Can it be done via email or chat?
- Do you have existing feedback?
- Do you need to "go and see" and observe using an empathy map?

# Jobs to Be Done



What jobs are your customers trying to get done?



Clay Christensen, *The Innovators Dilemma* (Jobs to be Done )

1

What tasks are your customers trying to perform in their work or personal life?

2

What functional problems are your customers trying to solve?

3

What emotional needs are your customers trying to satisfy?





# LUNCH BREAK



# Jobs to Be Done

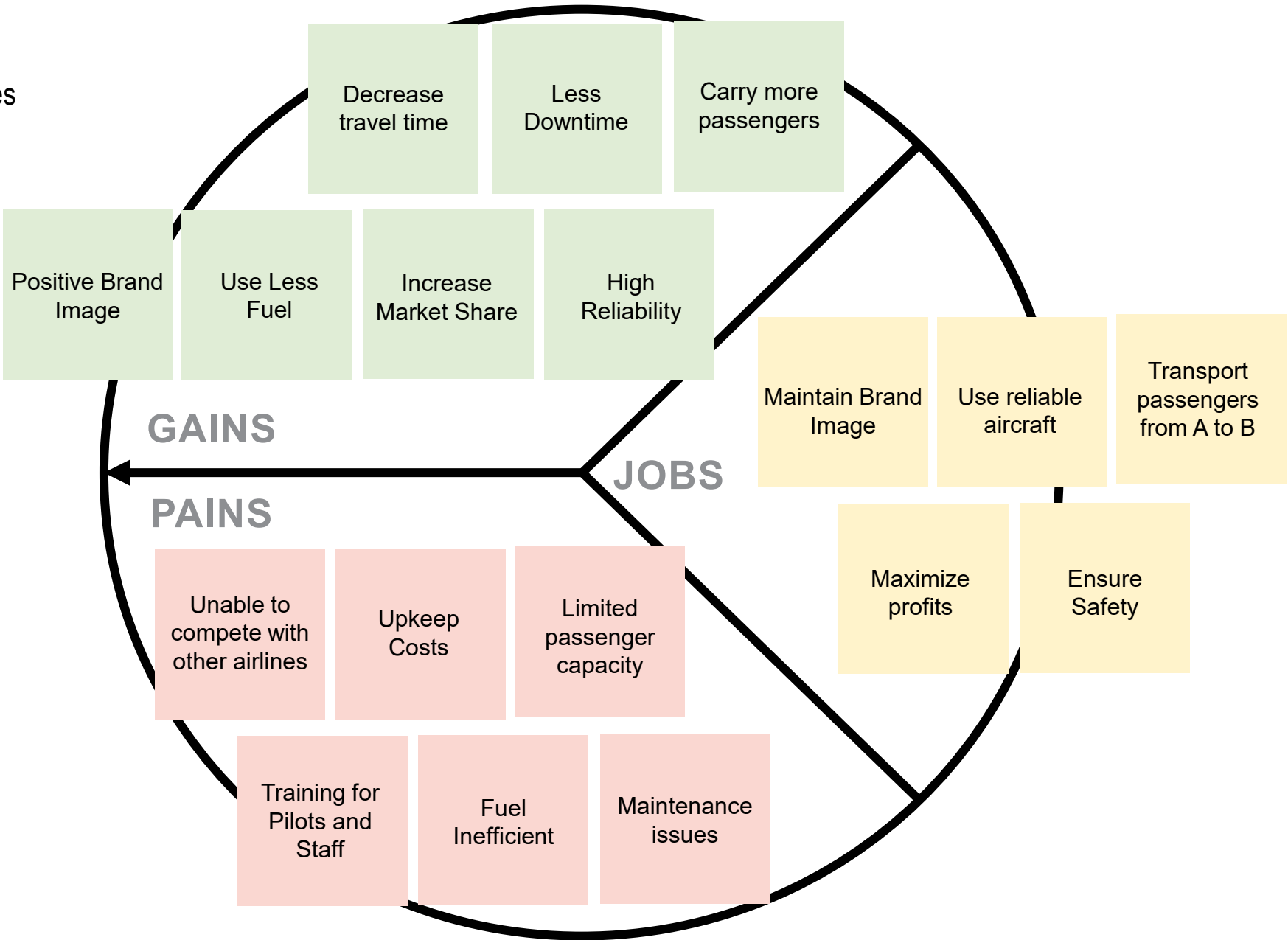


Practice the customer profile using the case study example



- ✓ Reread the case study on page 23
- ✓ Breakout into groups
- ✓ Identify the jobs, pains, and gains of the customer: Commercial Airlines (6 minutes)
- ✓ Report out (4 minutes)

**CUSTOMER:** Commercial airlines

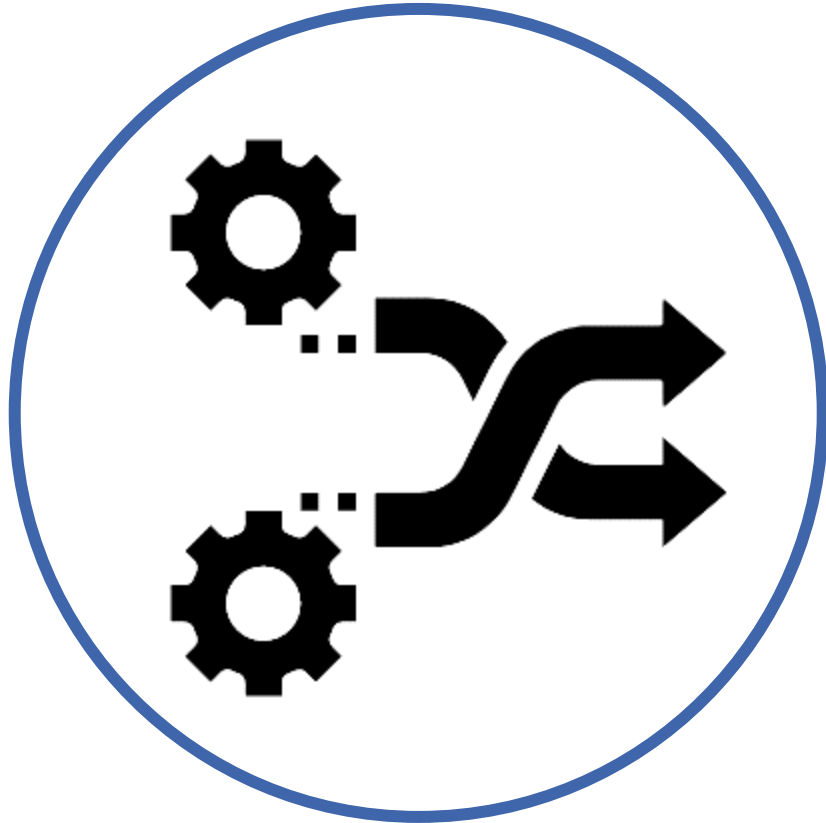


A large commercial airplane is parked on a tarmac in the foreground. In the background, a large industrial facility, likely an aircraft manufacturing plant, is visible with various structures and equipment. The entire image has a blue tint.

# Lean Thinking

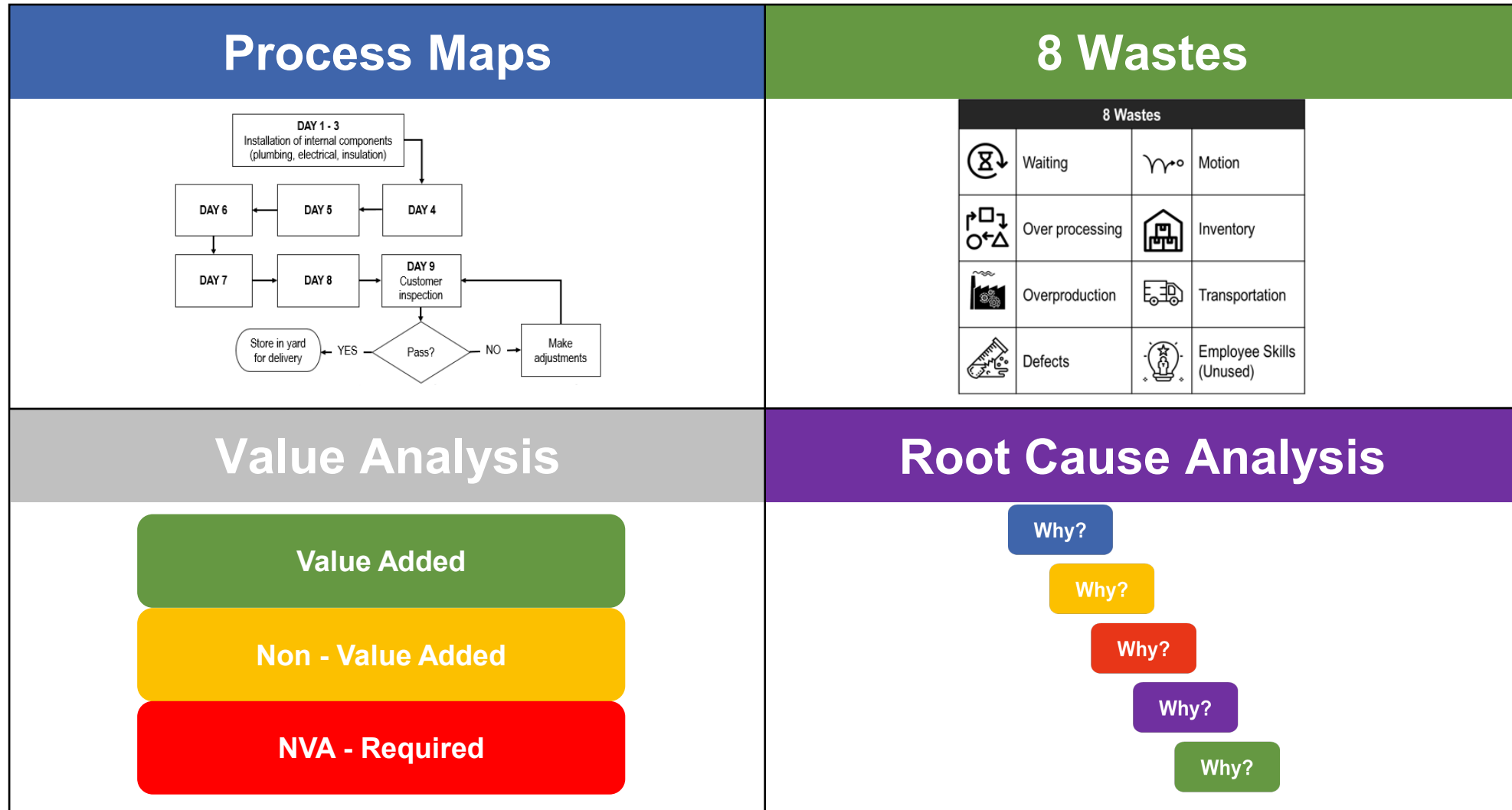
Common Sense Uncommonly Applied

# Lean Concepts in ci4i



- Focus on the customer's perspective
- Engage those closest to the work
- Prioritize "doing" over planning
- "Go and see" approach (aka gemba walk)
- Identify and eliminate waste
- Data driven decision making

# Lean Core Tools





# Process Mapping

## Why Process Map?



The purpose of process mapping during the investigate phase is to:

- Document the steps in the process
- Define process scope (start & end)
- Establish process ownership and responsibilities
- Identify bottlenecks, repetition, waste
- Identify improvement opportunities

# Case Study: Boeing Then and Now



**Practice creating a 9-step process map using the case study video.**

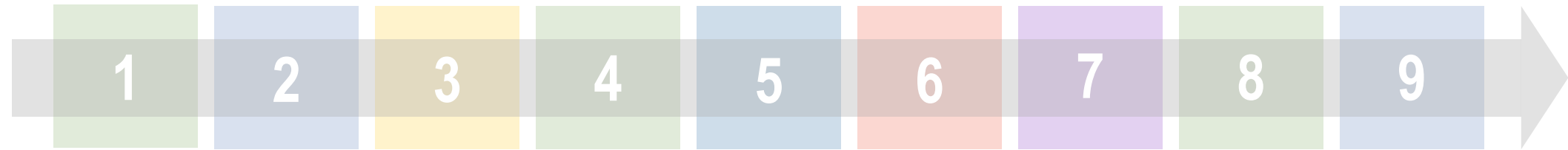
Follow along with the video to capture the process of assembling a Boeing 737 airplane.

- ✓ Listen carefully
- ✓ Write down all steps
- ✓ Use 1 line for each day

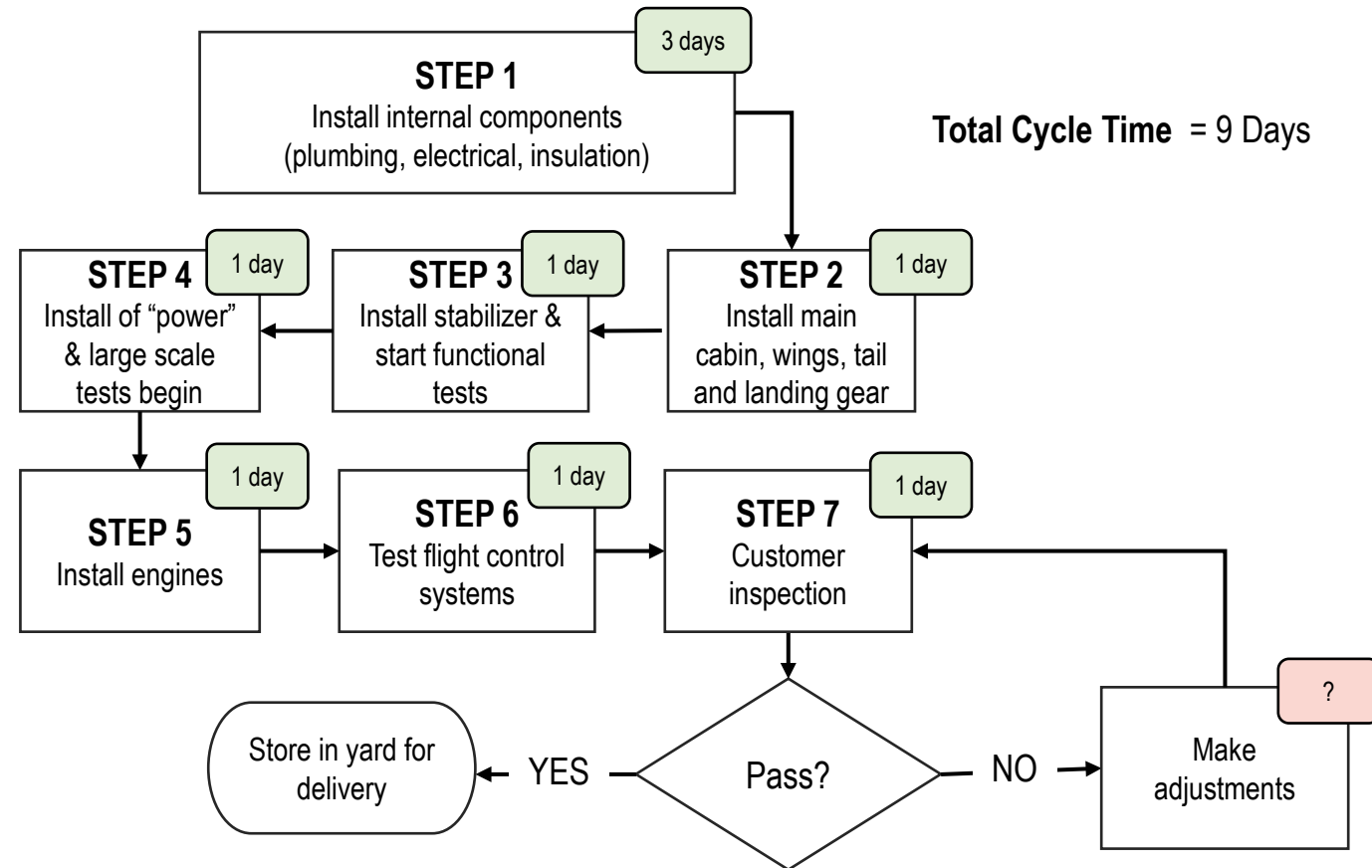




# Case Study: Boeing Then and Now



Day 1:	Installation of internal components
Day 2:	Installation of internal components
Day 3:	Installation of internal components
Day 4:	Install main cabin, wings, tail and landing gear
Day 5:	Installation of stabilizer & start of functional tests
Day 6:	Installation of "power" and large-scale tests begin
Day 7:	Installation of engines
Day 8:	Testing of flight control systems
Day 9:	Customer completes inspection











# What are the 8 Wastes?

W

O

O

D

8 Wastes			
	<b>Waiting:</b> People waiting on material or equipment. Ex: Waiting for inbox to fill up before processing paperwork.		<b>Motion:</b> Unnecessary, repetitive movement of people equipment or machinery. Ex: Walking, lifting, reaching.
	<b>Overproduction:</b> Creating something before it is asked for or required. Ex: Too many copies, reports that no one reads.		<b>Inventory:</b> Producing more than the customer needs. Ex: Purchasing too many supplies, unused files in a database.
	<b>Overprocessing:</b> Doing more work, adding components or steps. Ex: Using higher precision than necessary.		<b>Transportation:</b> Movement of people, inventory, equipment. Ex: Sitting far away from those you interact with frequently.
	<b>Defects:</b> Errors that make product or service unusable or result in rework. Ex: Forms with missing information.		<b>Employee Skills (Unused):</b> Waste of human talent or ingenuity. Ex: Not asking for employee feedback.

M

I

T

E

**Goal: Reduce or eliminate non-value added steps.**



# Case Study: Boeing Then and Now



Practice documenting waste using the case study example.



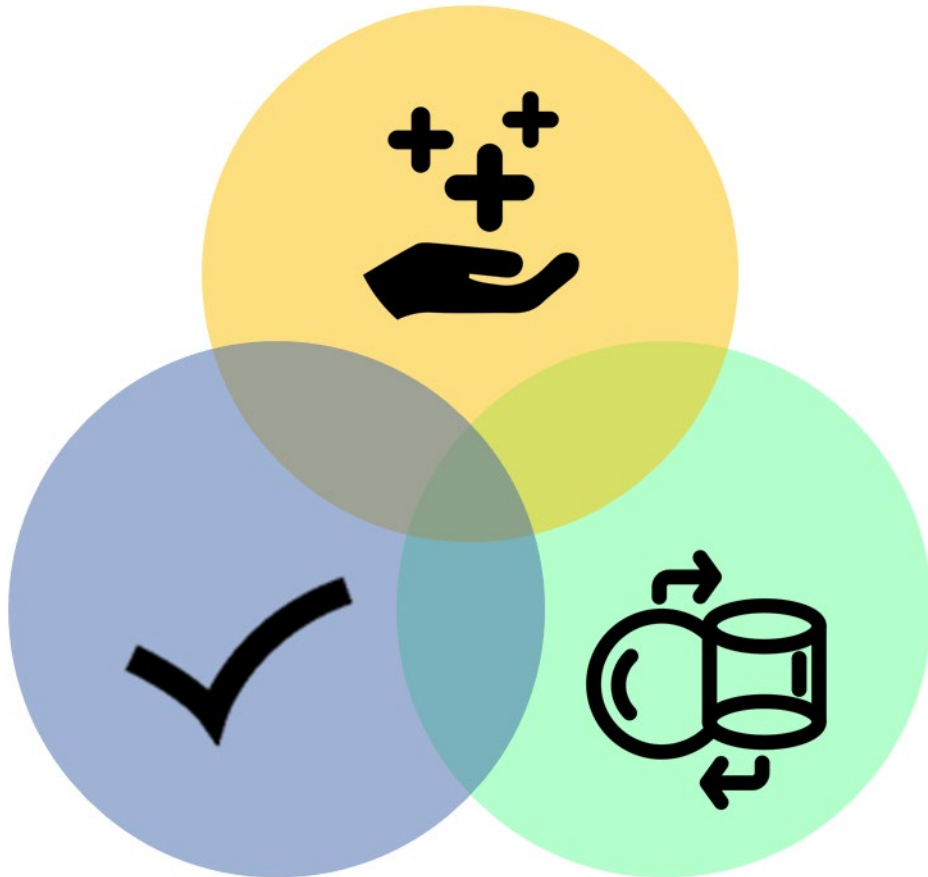
As a team, you are assigned responsibility for analyzing wastes in Boeing's 737 assembly process.









Did you identify any of the 8 wastes?

- ✓ 5 minutes to brainstorm in groups
- ✓ Assign 1 recorder to report out
- ✓ Use workbook to capture ideas
- ✓ Report out (4-5 minutes)



# How does the Customer define value?



8 Wastes			
	Waiting		Motion
	Over processing		Inventory
	Overproduction		Transportation
	Defects		Employee Skills (Unused)

A photograph of a long-haired dog, possibly a Shetland Sheepdog, lying on a bed with its eyes closed, wearing large white headphones. A black smartphone is lying on the bed to the left of the dog, with a white charging cable plugged into it. The entire image is overlaid with a semi-transparent blue filter.

# BREAK TIME

Return in 15 minutes

# Process Mapping in Real Time



Practice creating a process map.



Create a process map that describes your daily commute.

Work on creating a process map individually. Then, discuss.

- ✓ What do you do first/last?
- ✓ What 3-7 steps happen between the beginning and the end?



# Detailed Process Mapping



Practice adding details to your process map.



Supplement your original process map by adding important details.

- ✓ How long does each step take?
- ✓ Should certain tasks be prepared ahead of others?
- ✓ What is the value added by each step?
- ✓ Are there decision points that impact the process?

# Value Added Analysis

## Value Added

- The customer must recognize the task as important.
- The product or service must physically change or transform.
- The task is done right the first time.

## Non-Value Added

- Waste. A process step that adds no value to the product or service.
- Does the customer want to pay for this?

## Non-Value Added, but Required

- A process step that adds no value to the product but is currently required to produce the product or service. A required law, regulation, rule etc. Internal or external.



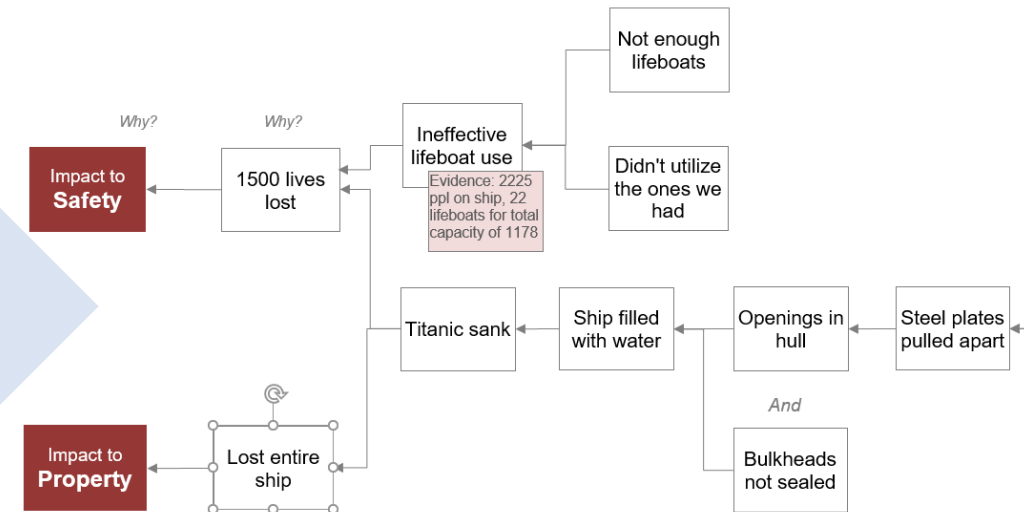
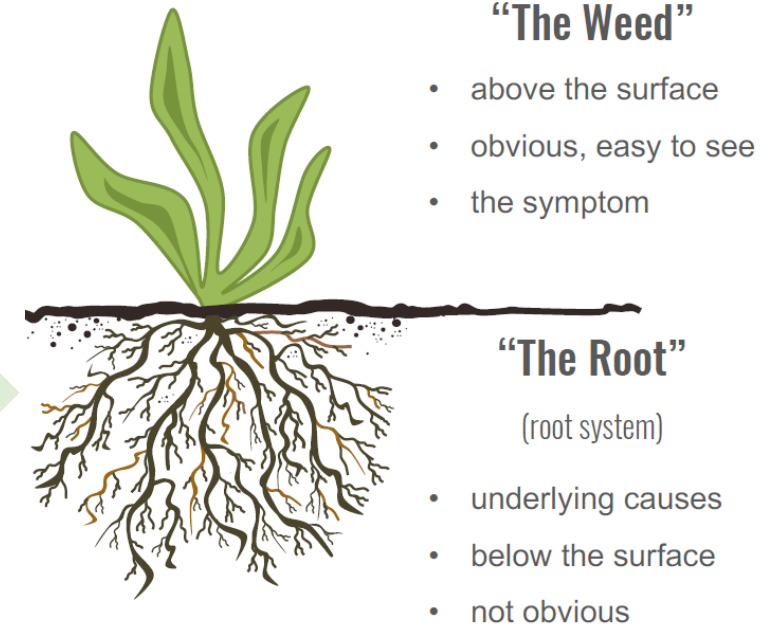
# Root Cause(s) Analysis

## Concept

- Since every effect has causes (plural), there isn't a cause (one cause) to any issue or event
- Getting to the root of an issue is the process of identifying **all the causes** by digging into the details

## Execution

- Focus on impacted goals
- Rely on evidence and facts (what, when, where)
- Start with what you know—using 5 Whys
- Facilitate a group with those closest to the work



# 5 Whys - Root Cause(s) Analysis



Why did Boeing encounter barriers entering the civil aviation market?

Why?

• Excuse

Why 1: Customers could not afford the price of airfare—2,800-3,800 today's \$

Why?

• Easy Answer

Why 2: Cost per flight were very high

Why?

• Thinking harder

Why 3: Carry less than 100 passengers

Why?

• Getting closer

Why 4: Plane lacks space for more seats

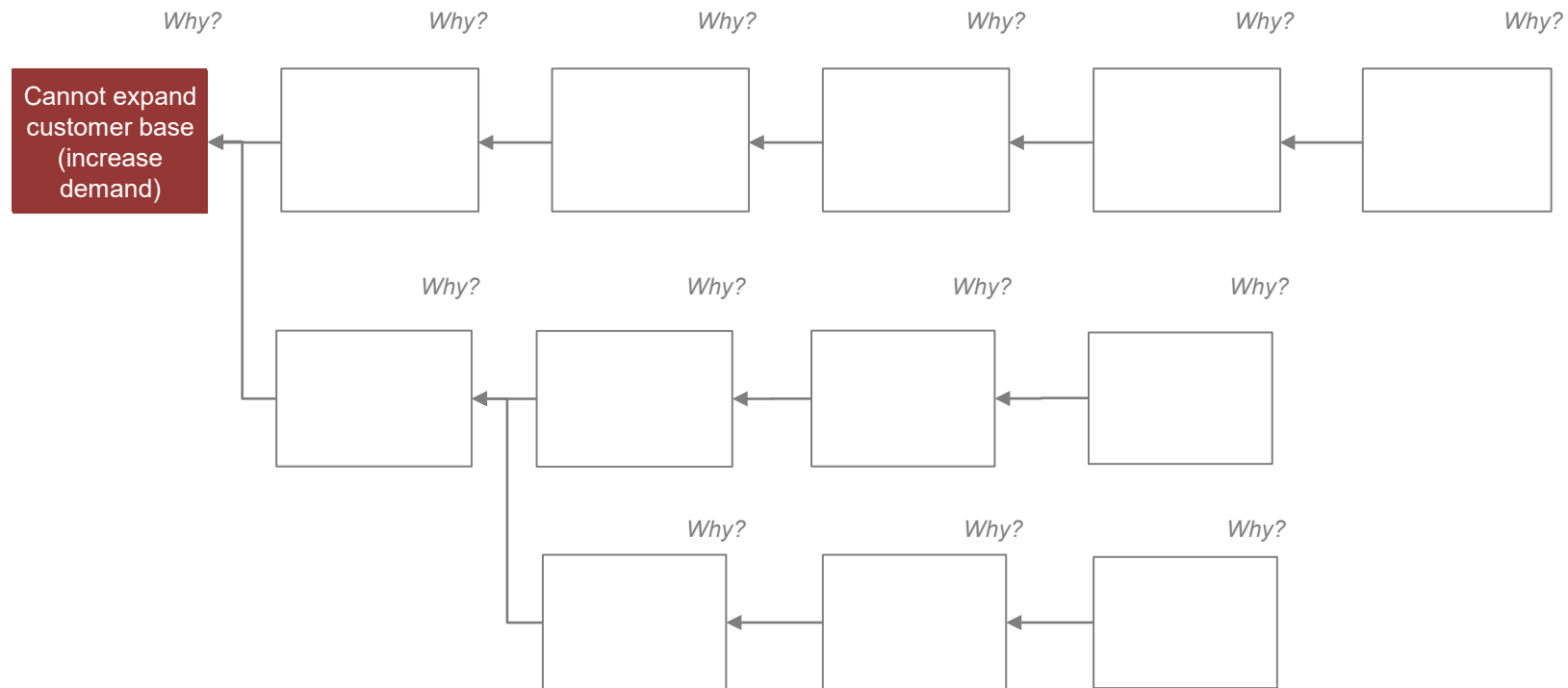
Why?

• Real reason

Why 5: Double decker design based on wartime Stratofreighter

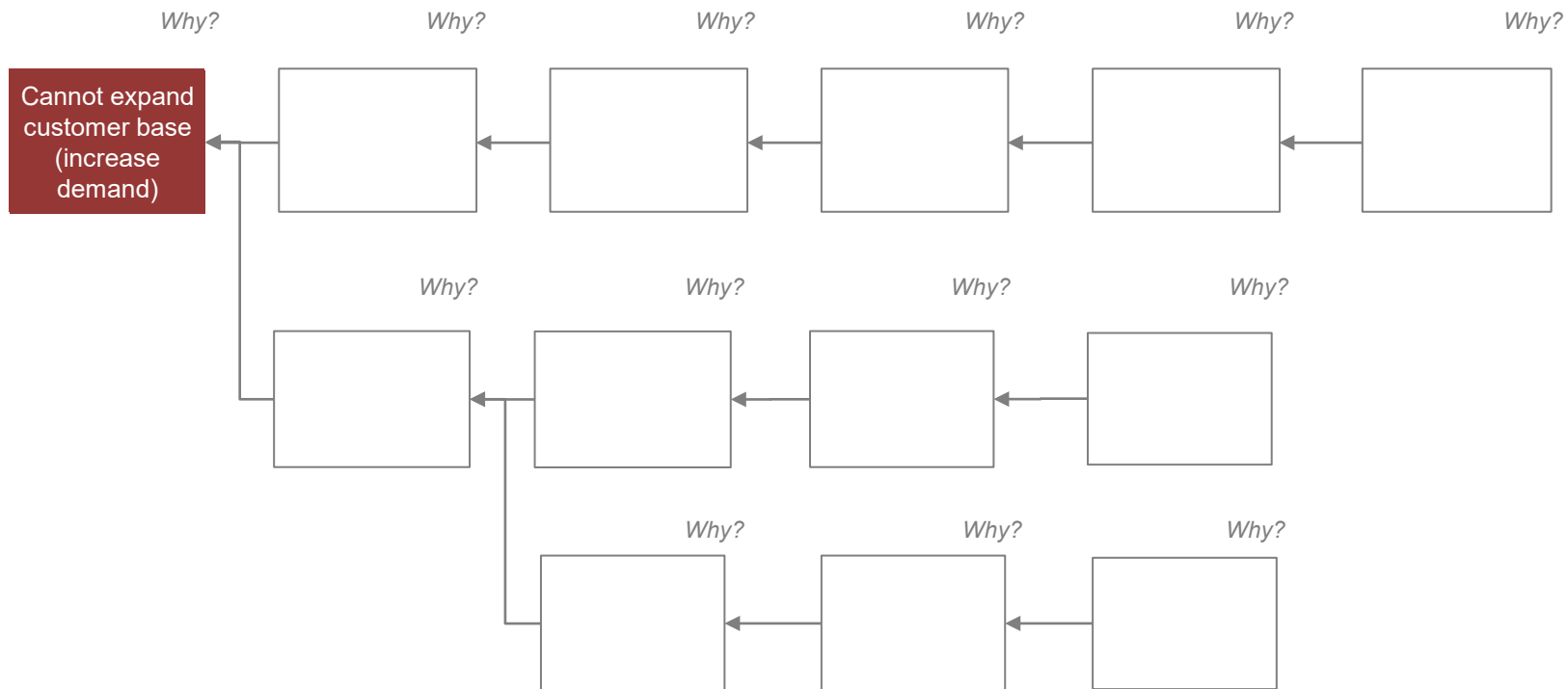
# 5 Whys—Root Cause(s) Analysis

Why did Boeing encounter barriers entering the civil aviation market?



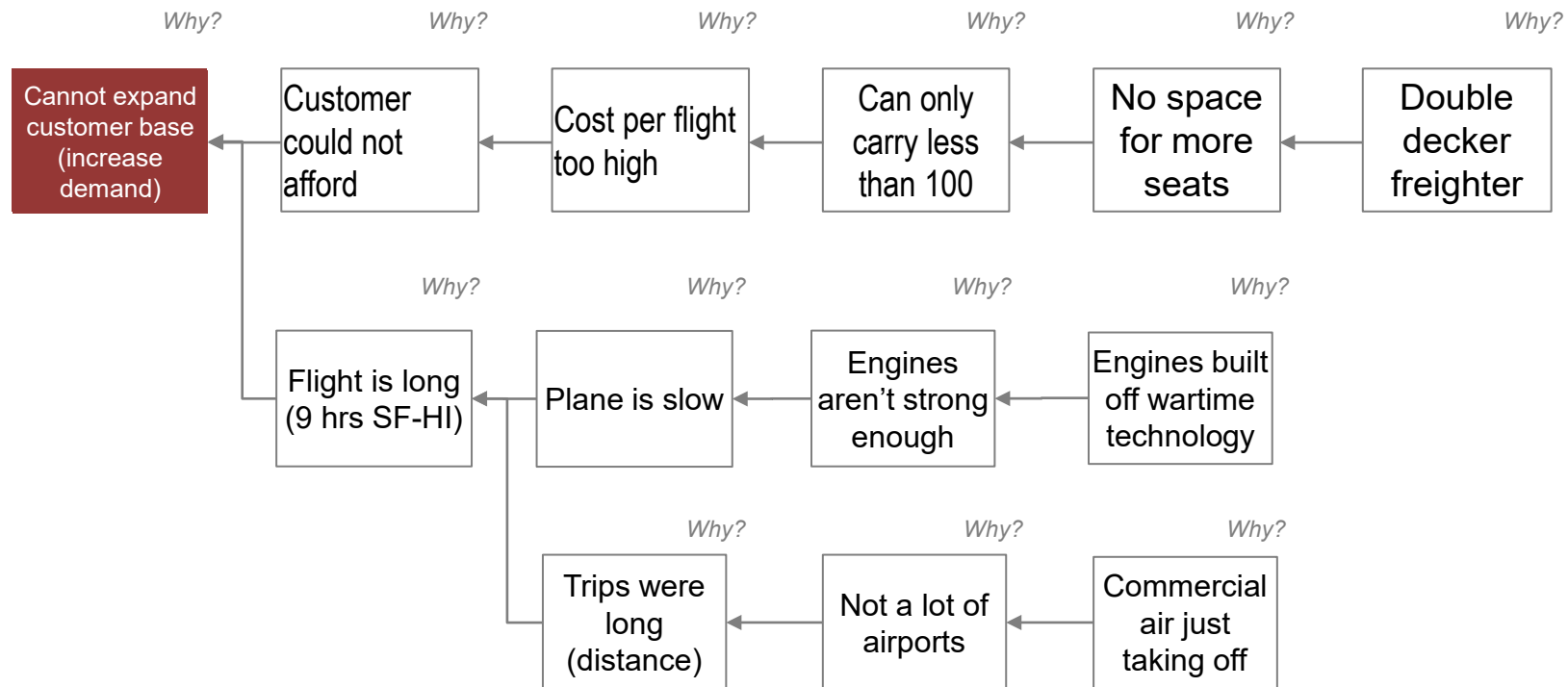
# 5 Whys—Root Cause(s) Analysis

Why did Boeing encounter barriers entering the civil aviation market?

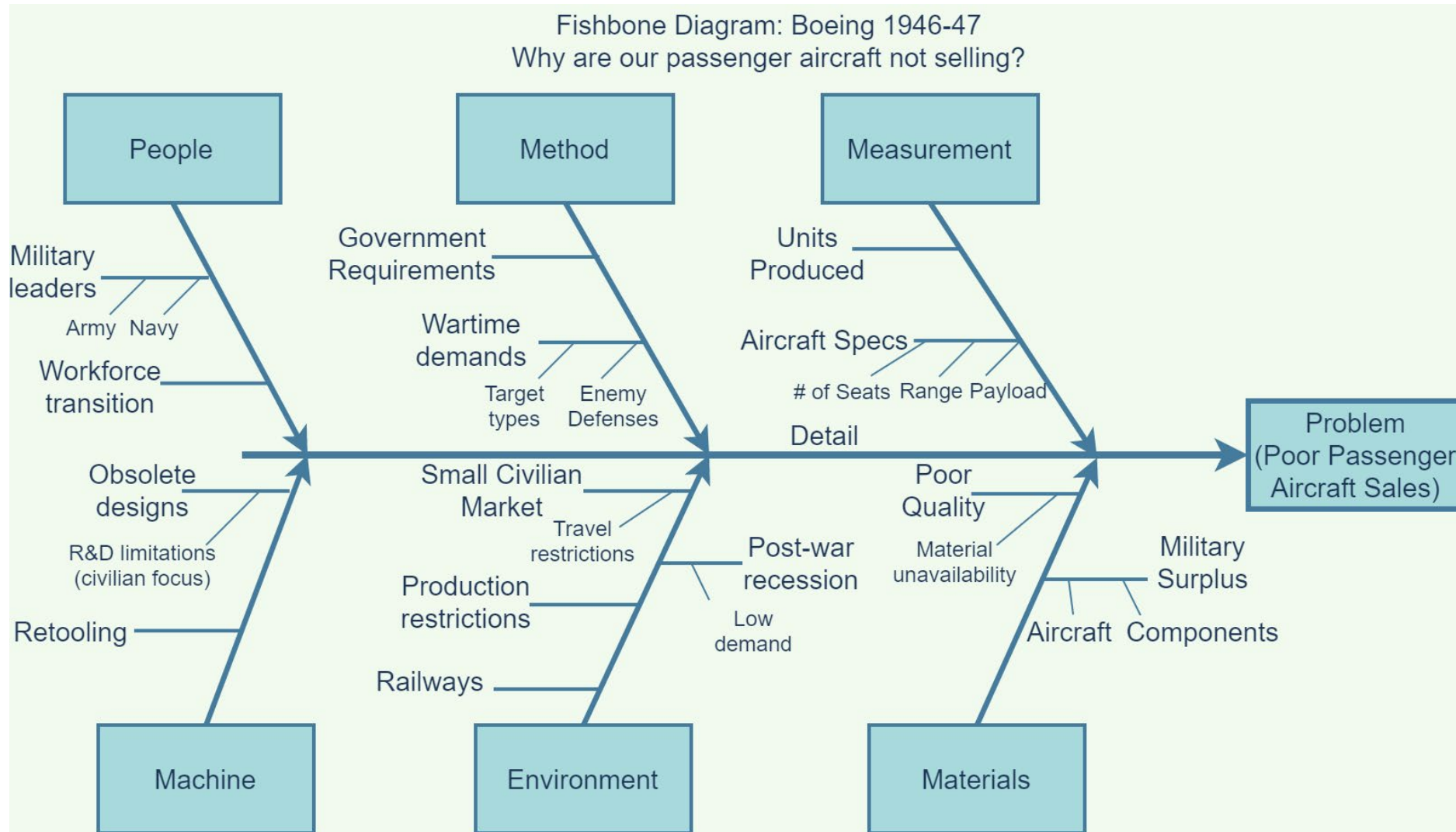


# 5 Whys—Root Cause(s) Analysis

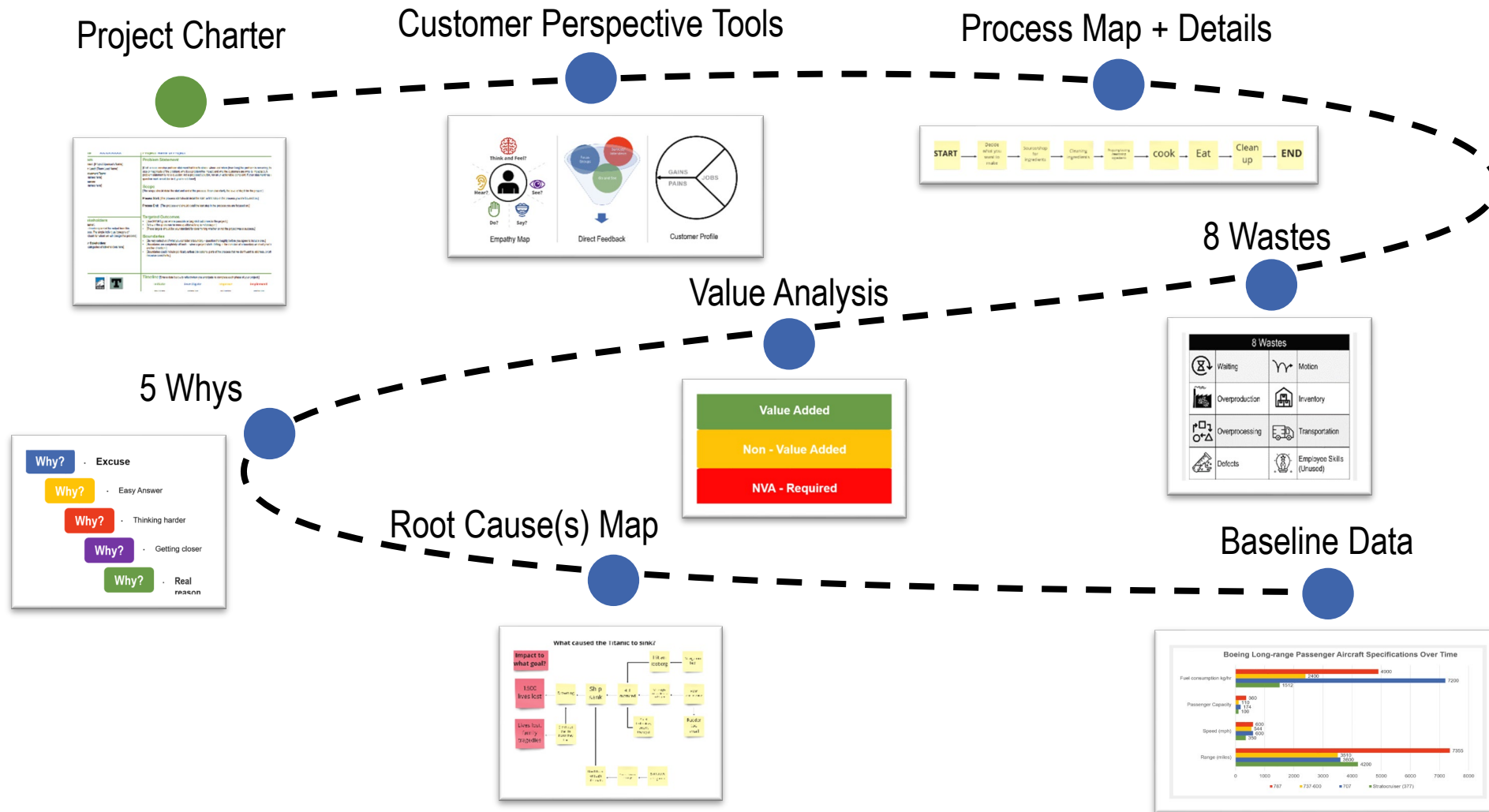
Why did Boeing encounter barriers entering the civil aviation market?



# Fishbone Diagram Use Case



# ci4i Project Journey







# Data

## Measure It and Prove It



---

“Without data you are just another  
person with an opinion.”

---

W. Edwards Deming



# Measure It and Prove It

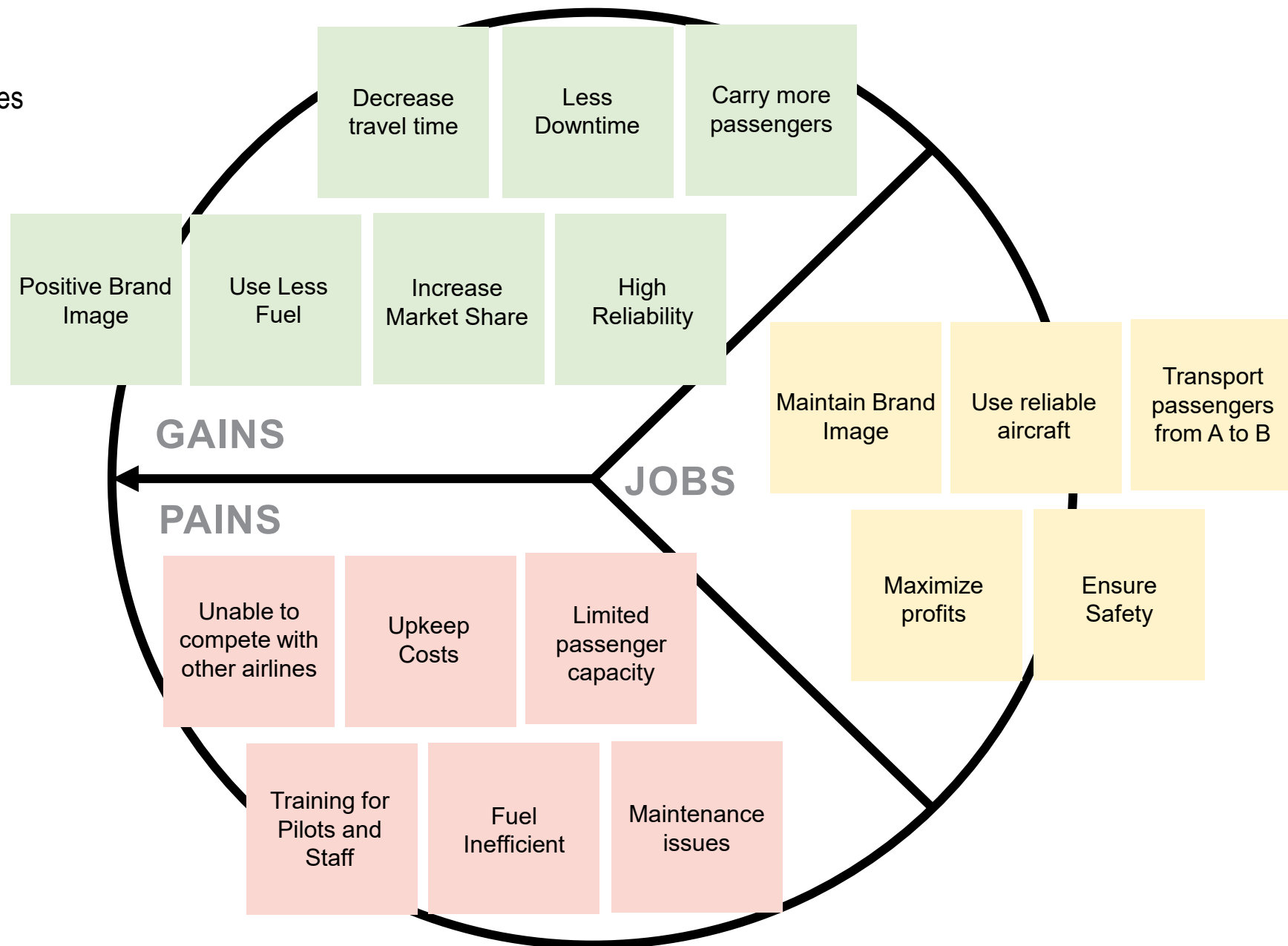
## Data Collection

- **Select meaningful data-** Know how it relates to your targeted outcomes.
- **Identify the pieces-** List all components needed to form your measures.
- **Identify sources-** Where you will get the data? Who will provide or generate it?
- **Start with a baseline-** Ensure what you measure now can be consistently measured in the future.

## Data Analysis

- **Form a hypothesis-** Take a proposed solution and make a prediction about the outcome.
- **Make an improvement-** Conduct interviews or surveys, run a pilot program or design a prototype.
- **Collect more data-** Be sure to use the same measures you identified in your baseline.
- **Compare-** Did you get the results you expected? Were you able to prove or disprove your hypothesis?

**CUSTOMER:** Commercial airlines



# Case Study: Boeing Then and Now



**Brainstorm baseline data points using the case study.**

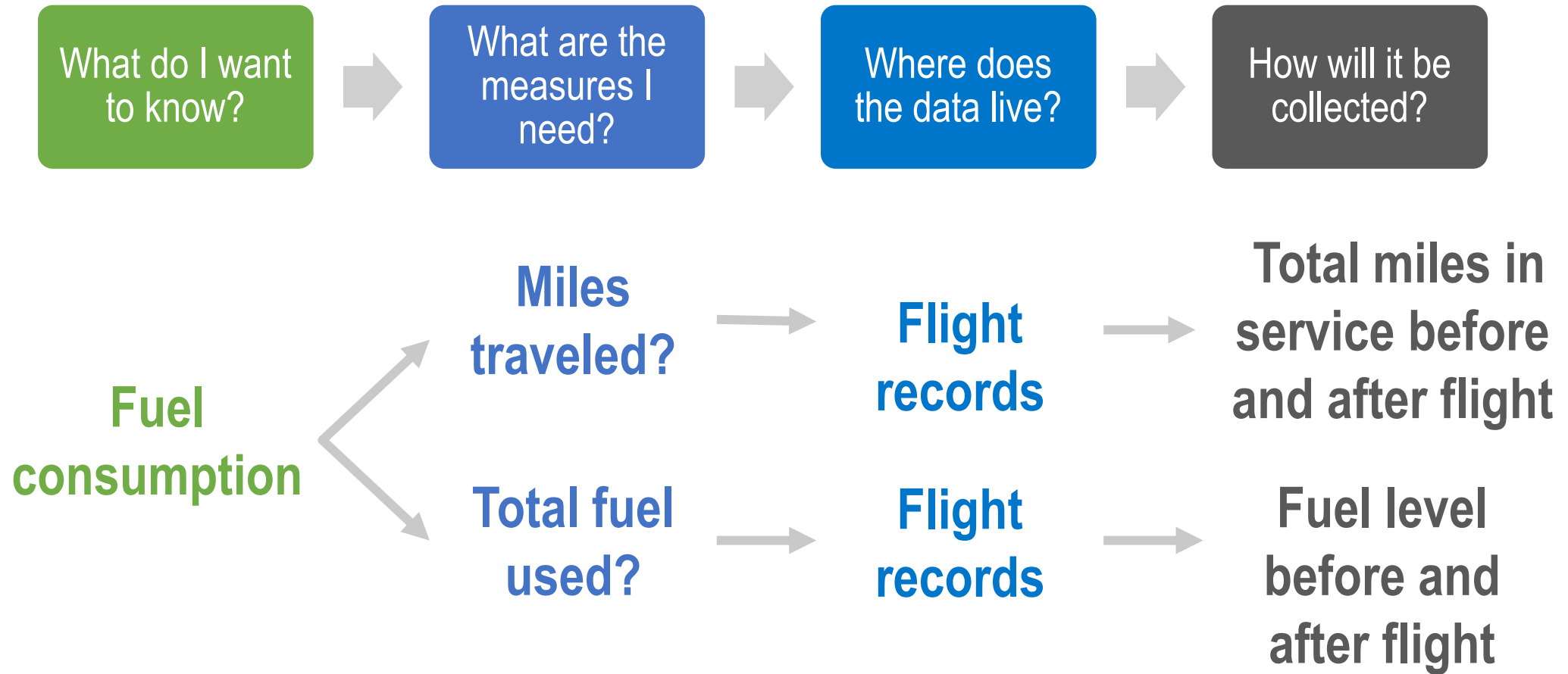


You are assigned responsibility for designing a new aircraft. Your design must be faster and more profitable than the Boeing 377 Stratocruiser.

What data would you want to know in order to measure the impact of proposed improvements?

- ✓ 3 minutes to brainstorm
- ✓ Use workbook to capture ideas
- ✓ Report out (4-5 minutes)

# Breaking Down Data



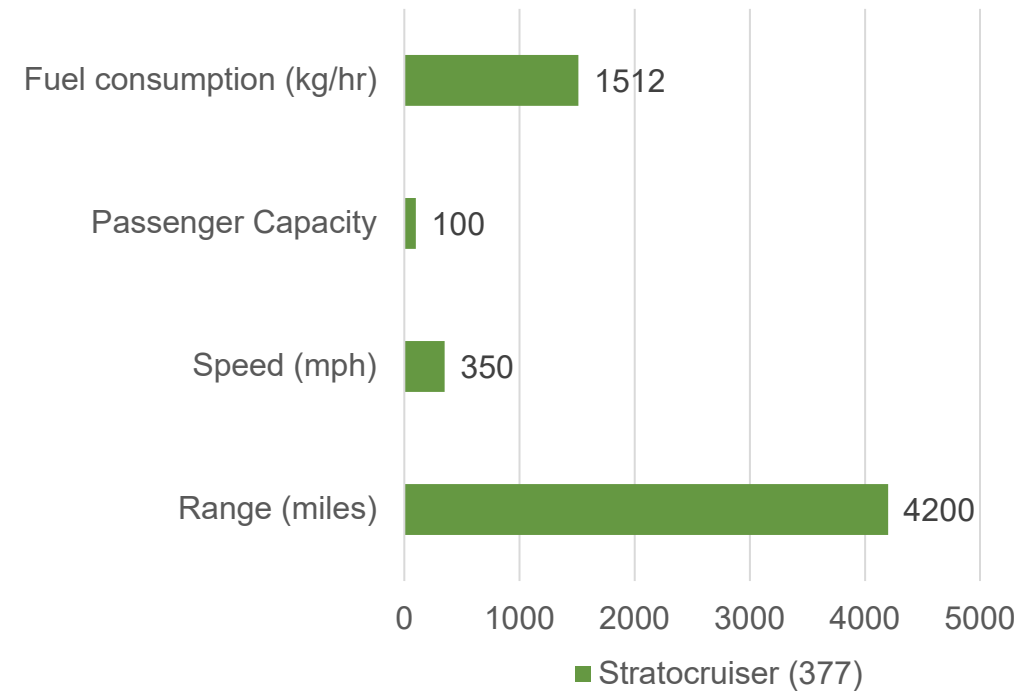
# Case Study: Boeing Then and Now



## Baseline Data Example



**Boeing Stratocruiser (377)**





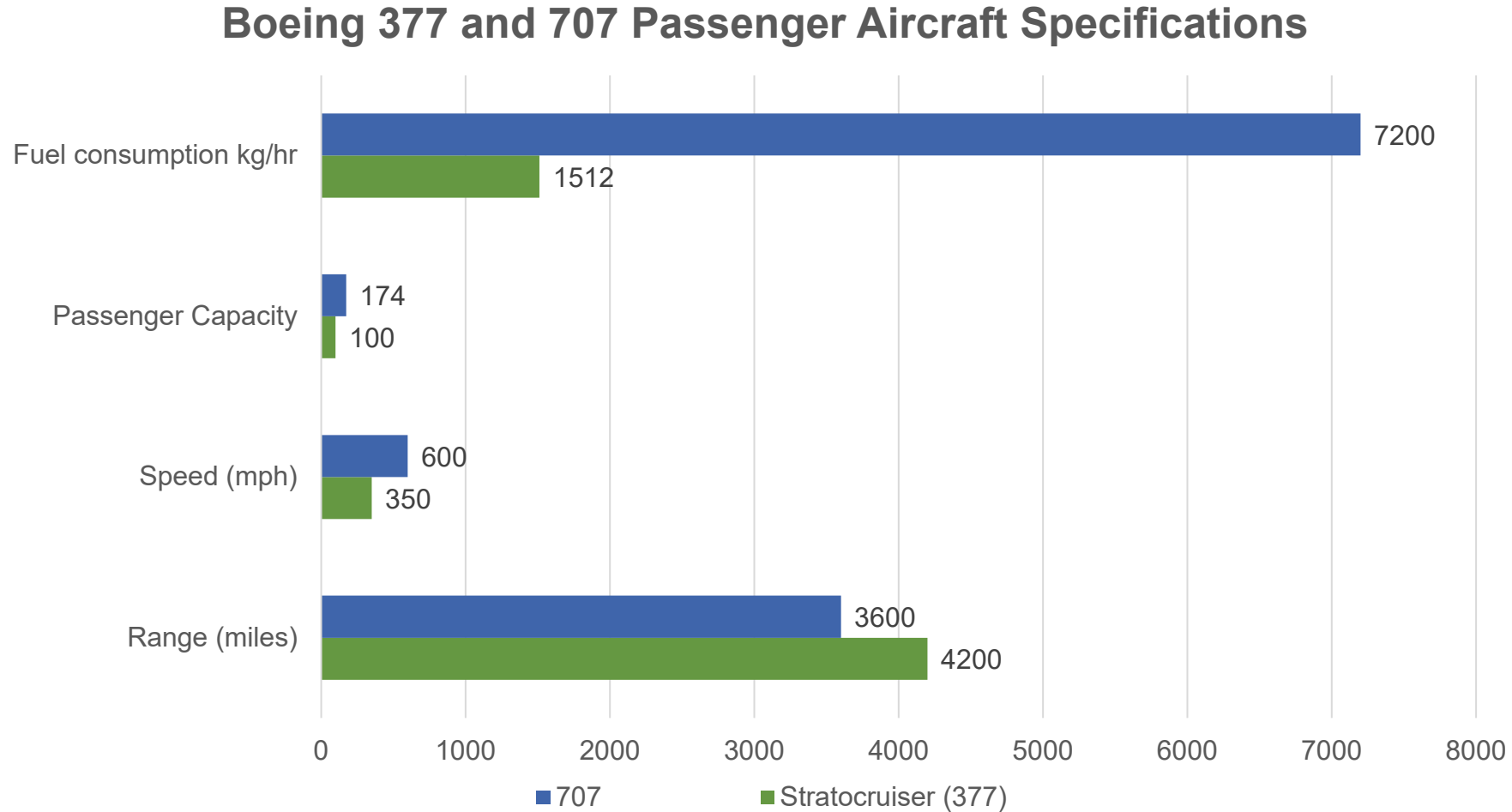
# Case Study: Boeing Then and Now



How would Boeing know if the new design was a success?

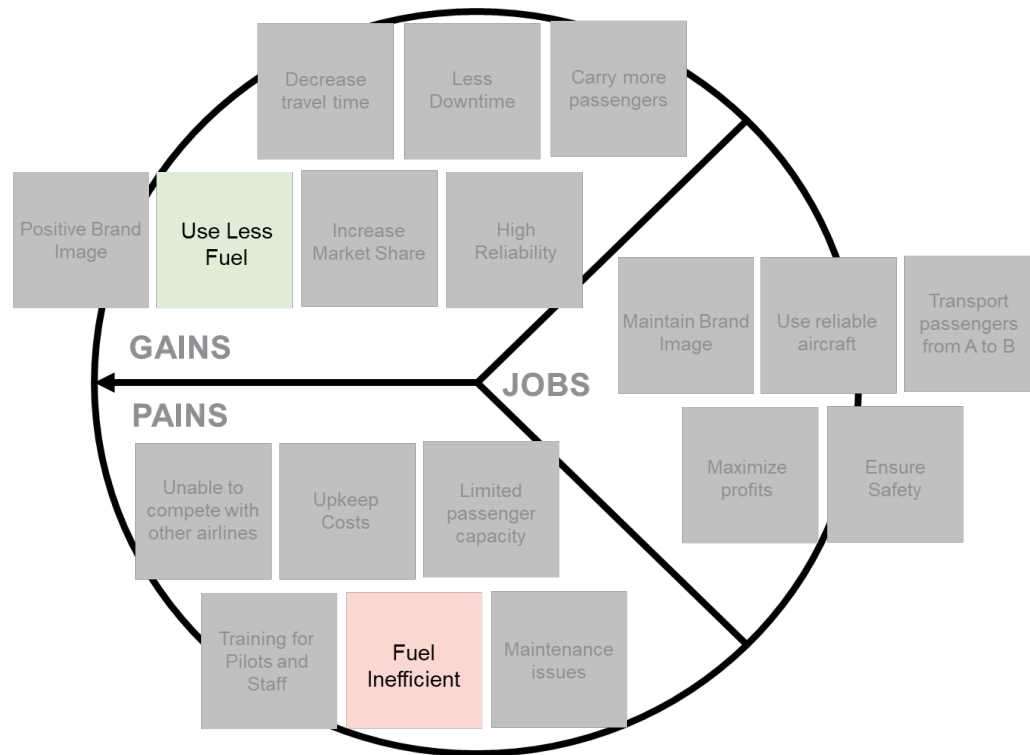


# What changes were prioritized in the 707?

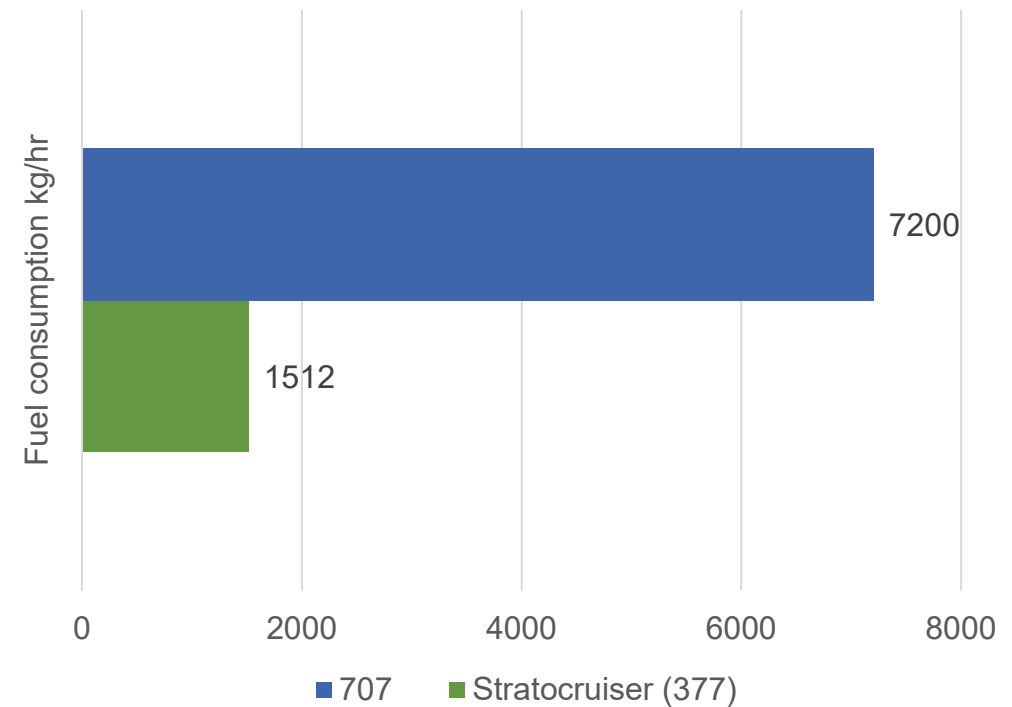


# Fuel Consumption

The 707 used almost 4 times as much fuel to operate.

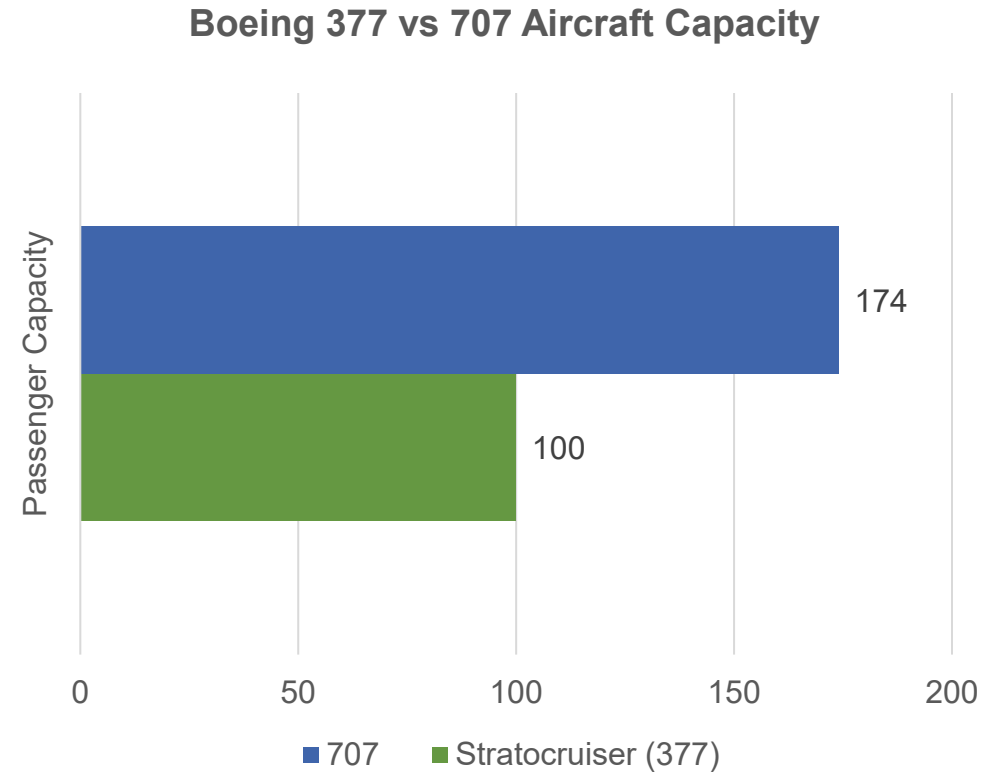
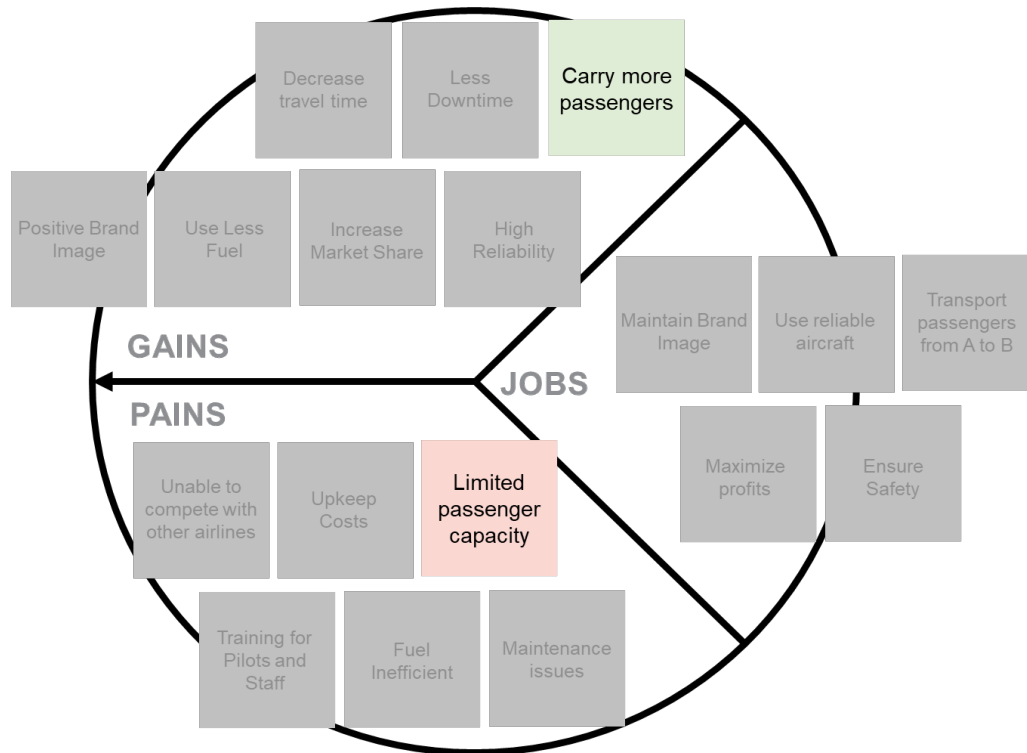


Boeing 377 vs 707 Aircraft Fuel Consumption



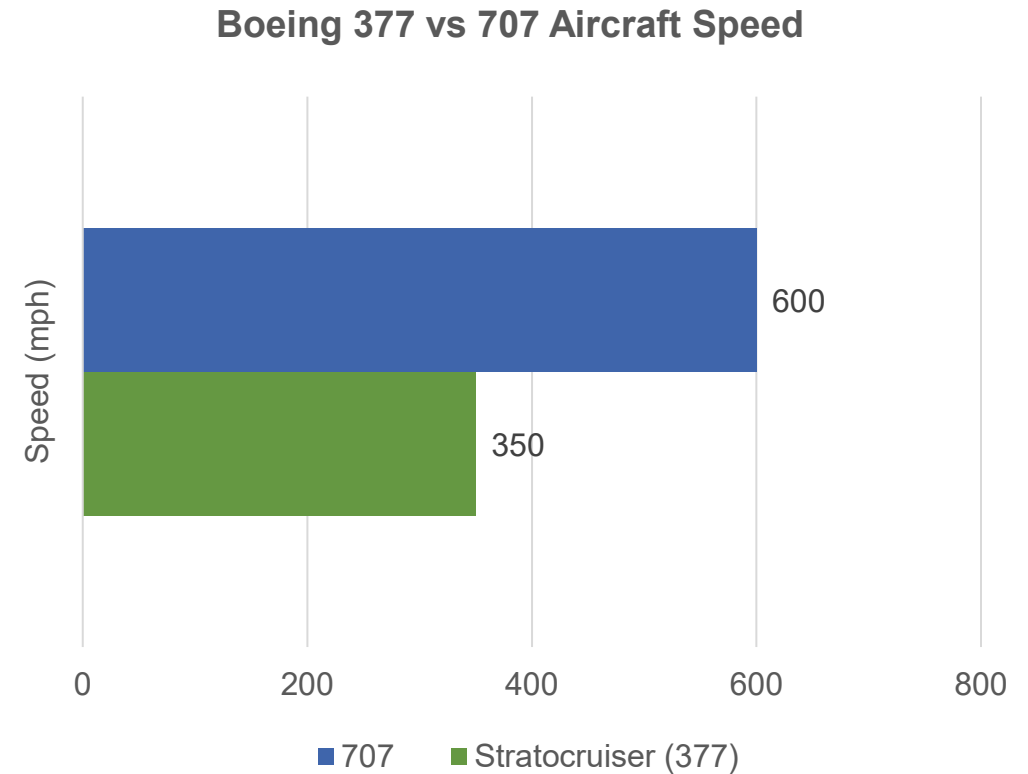
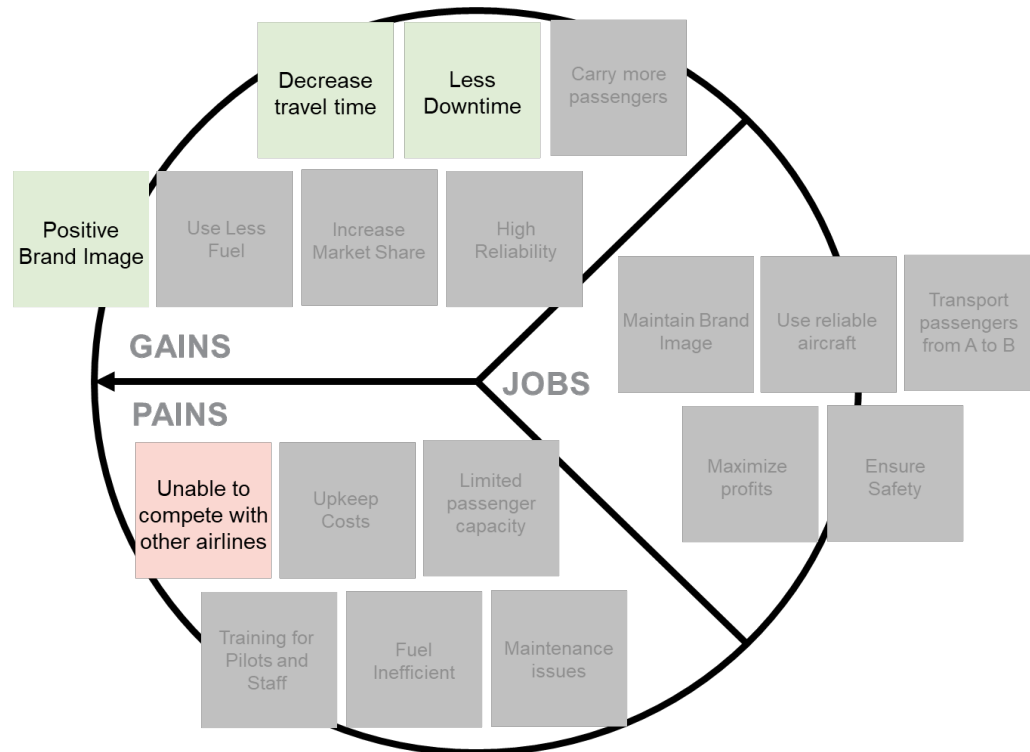
# Capacity

The 707 had room for 74 additional passengers.



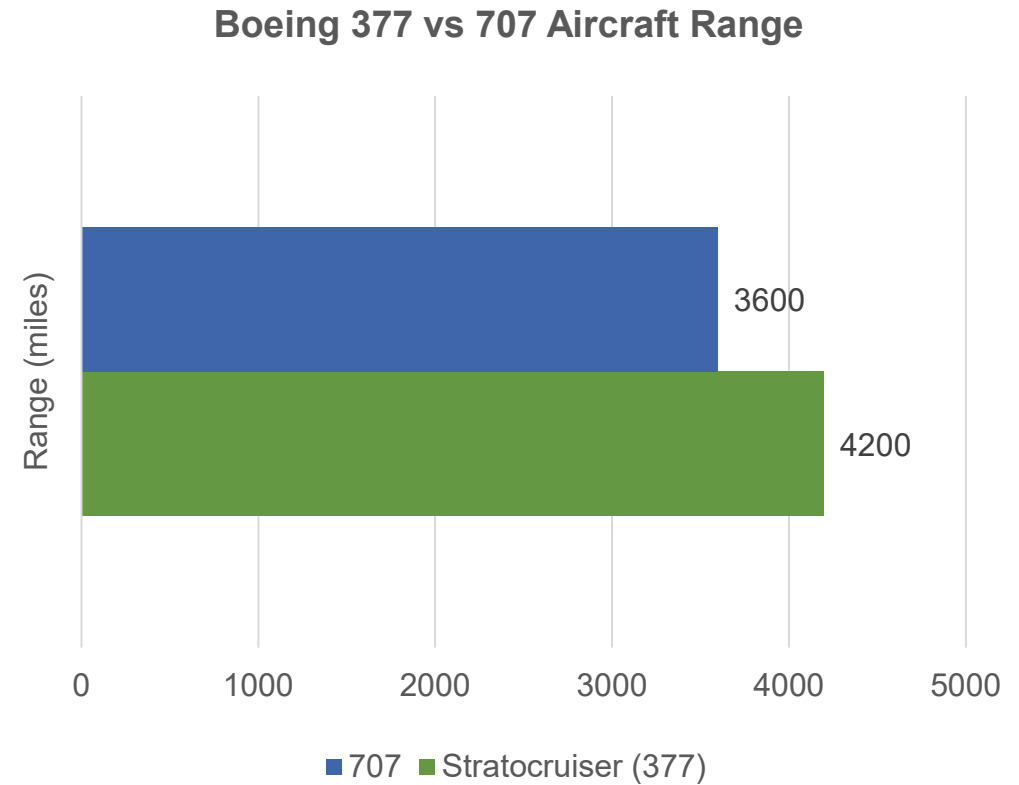
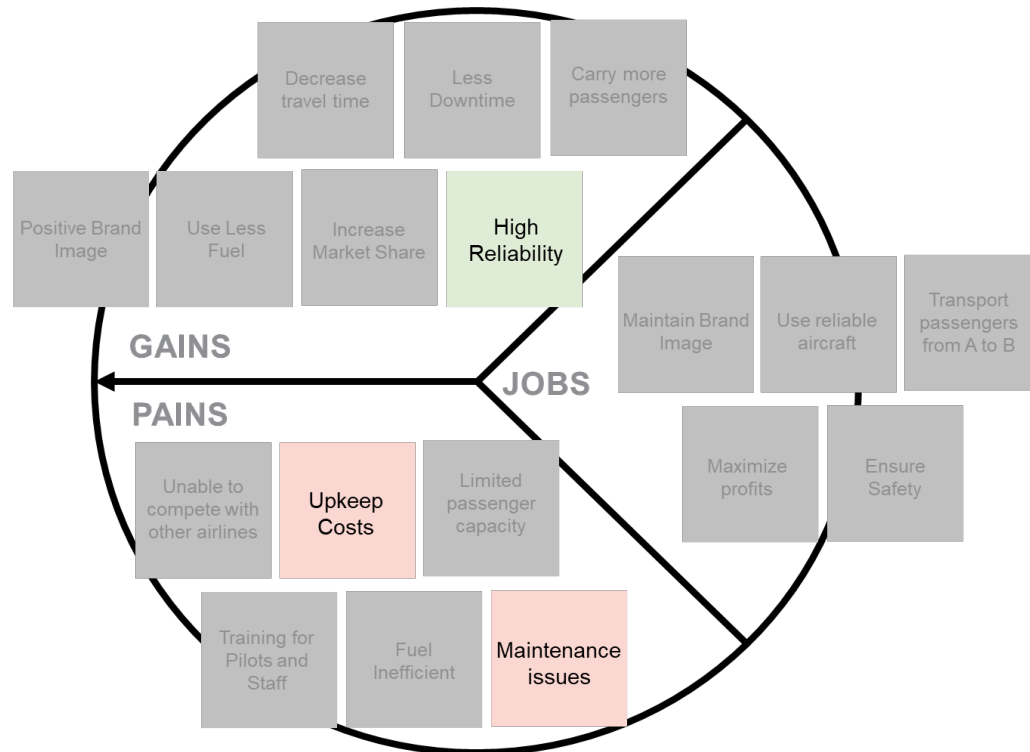
# Speed

The 707 speed increased by 71% or 250 miles per hour.



# Range

The 707 range decreased by 15% or 600 miles.



# Summary

## What changes did Boeing prioritize in the 707?



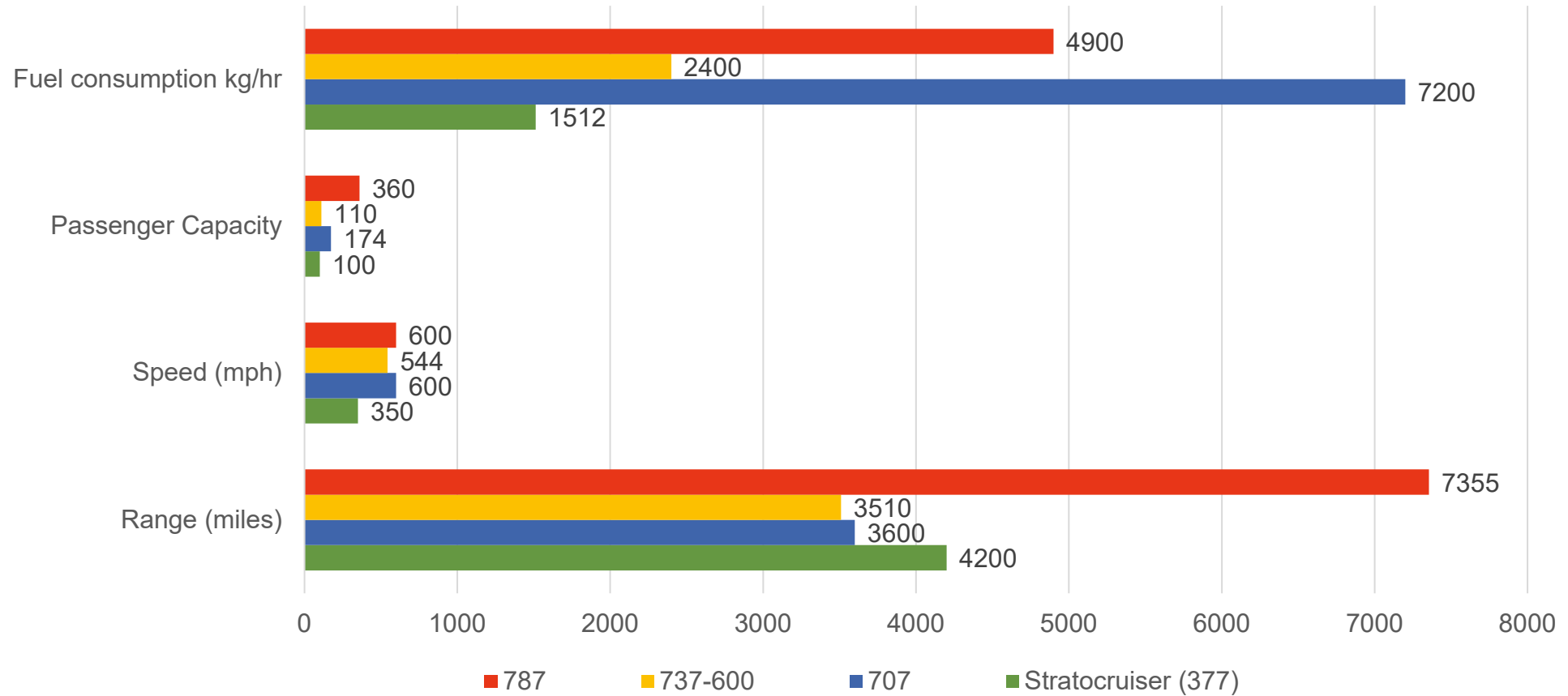
Compared to the Boeing 377, the 707:

- Required a lot more fuel
- Could not go as far per trip but, allowed carriers to transport more passengers
- Was faster and had less downtime



# Change in Customer Expectations

Boeing Long-range Passenger Aircraft Specifications Over Time



# Where Do You Get Data?

## ASK FOR IT



Stories are a start...  
Customer interviews  
Focus Groups

## FROM IT SYSTEMS



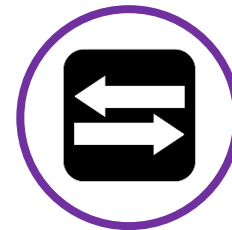
SAP  
Custom databases  
Exports from software

## CREATE IT



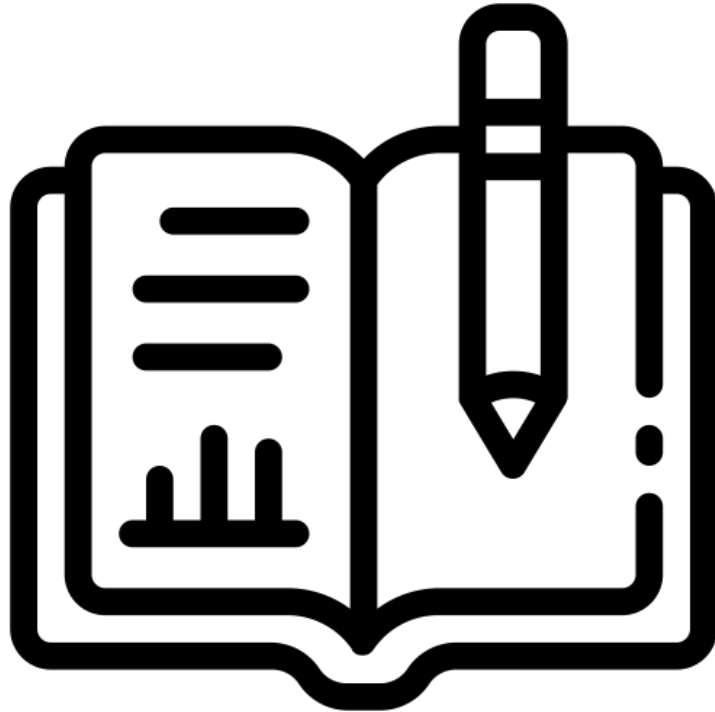
Document processes  
Manual data entry  
Performance measures

## BORROW IT



Federal data  
Academic research  
Industry benchmarks

# Homework



## Project Work

- ☐ Finalize Charter
    - ☐ Upload Final Draft on SharePoint
  - ☐ Identify what data you intend to collect
  - ☐ Complete a Current State Process Map\*
    - ☐ Add detail to your outlined high-level steps 1-9
  - ☐ Perform Value or Waste Analysis\*
  - ☐ Perform Root Cause Analysis (RCA)\*
    - ☐ Use 5 Whys, Fishbone, or other RCA tool as you see fit
- \* Note: These activities should be done in a workshop setting with your project team

## Office Hours

- ☐ Schedule & Attend Office Hour
    - With your Assigned CI Consultant
    - Review Project Work
- Note: Must occur prior to next CIA In Person Session

## Miscellaneous Tasks *(if not yet complete)*

- ☐ Forward Project Exhibition Calendar Invite to leadership
  - From: improve@cityoftacoma.org
  - Forward to Project Sponsor, Project Champion, Other Management as deemed appropriate

Note: Your immediate management has already been invited