



# **Increasing First Run Parts From 60% to 90%**

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# Executive Summary

## Business Case

What is the importance of doing this project? (State In financial and productivity loss, cost avoidance, customer dissatisfaction, risk, etc.)

When products are scrapped to due programming, the company is losing money. On average the company is at 60% on new parts. That means that 40% of all new parts are wrong the first time. This problem is costing the company thousands of dollars.

## Root-Cause Analysis

What critical findins and root-causes where discovered?

Unclear steps in the process causing confusion between teams, and current system disorganized and outdated.

## Solutions Implemented

List of key solution that were implemented to address and correct the root-causes.

5S of the Finn Power was implemented and the removal of steps that did not add value to the overall process.

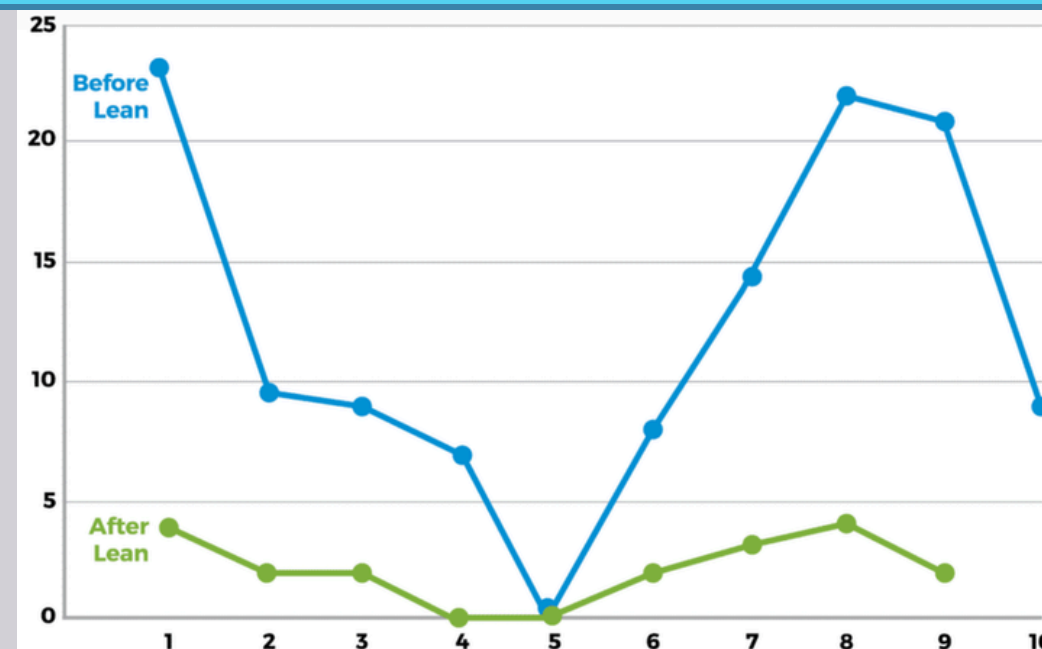
## Project Results

What were the measurable process Improvements and wins?

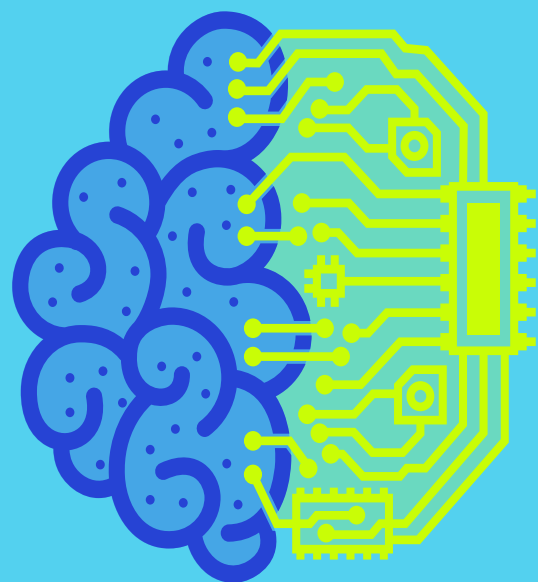
The scrap positive rate for first time parts increased from 60% up to 87%. I believe we have done great work on this project, and also believe we can still get better results as this process settles in as the new company standard.

## Graphic Display of Improvements

Graph illustrating the before and after process improvement.



**Key Takeaway:** The results were amazing with all the push back at first (we have always done it this way). Everyone was amazed how much the process has helped their stress level.



# DEFINE

PHASE

# Project Charter

## Problem Statement

The problem is that first run parts are only right 60% of the time. The parts that are wrong are due to several issues – wrong holes in wrong location, wrong materials, wrong size of part, wrong program numbers. This is costing the company thousands of dollars per week.

## Goal Statement

Increase the first run parts from 60% to 90%.

## Scope

- First Process Step: Orders come in
- Last Process Step: Orders are shipped
- In Scope: Process, Finn Power, blueprints, storing system
- Out Scope: New software, new tooling, cross training

## Business Case & Benefits

First run parts are only right 60% of the time. When this happens, the customer has to wait for the parts longer than expected. The price of the product is higher than competitors prices are due to rework and scraped materials.

## Timeline & Teams

| Phase   | Planned | Actual | Team                                    |
|---------|---------|--------|-----------------------------------------|
| Define  | Jan 20  | Jan 17 | Sponsor   Project Leads   Process Owner |
| Measure | Feb 16  | Feb 02 | Improvement Team   SME                  |
| Analyze | Feb 28  | Feb 28 | Data Analysis   Project Lead            |
| Improve | Mar 31  | Mar 28 | Process Stakeholder   Improvement Team  |
| Control | Jun 2   | Jun 3  | Operations   Process Owner              |

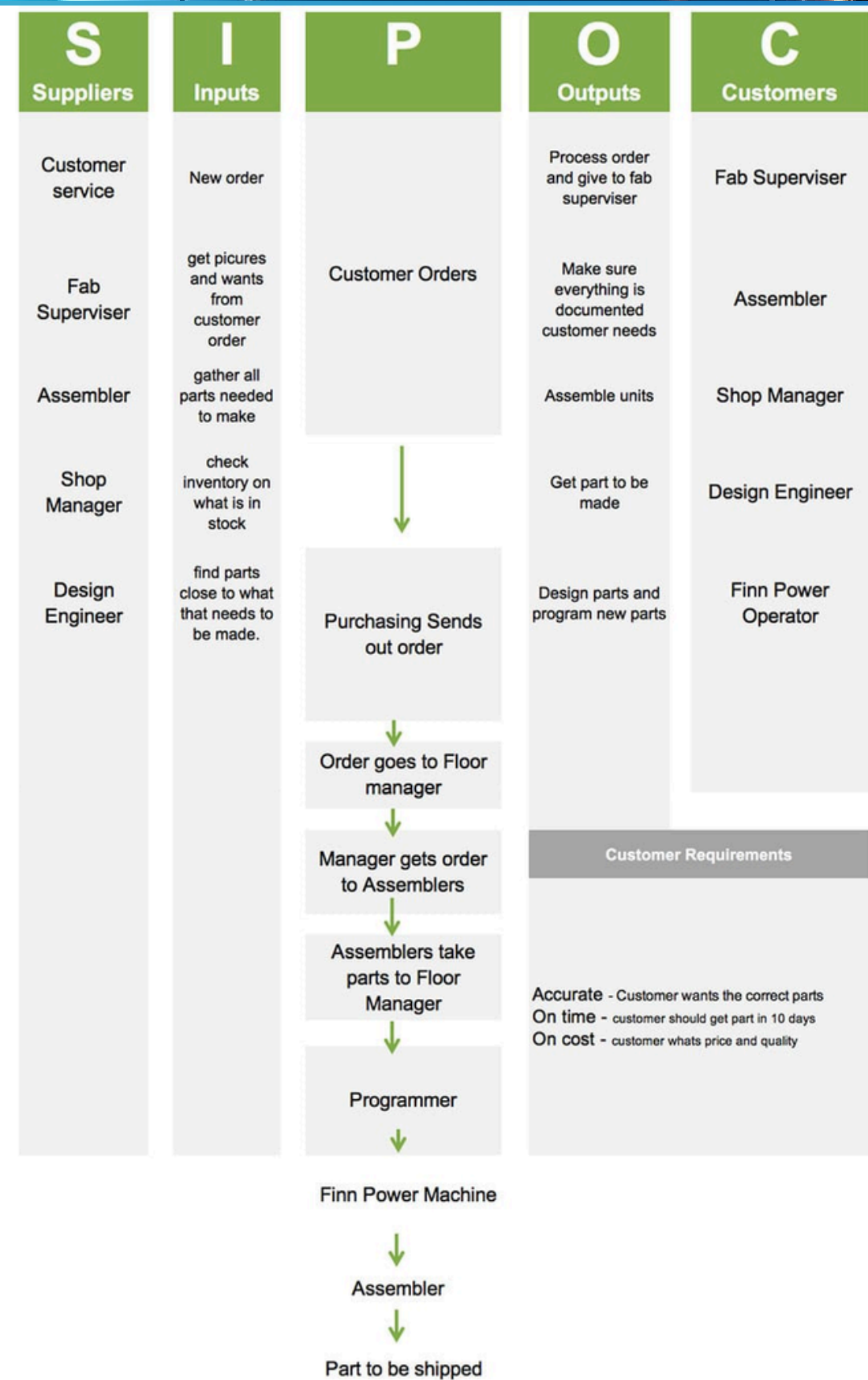
**Key Takeaway:** Everyone was super eager to start the next phase of transitioning, the project launch was great.



# Goal Statement

| Goal Statement Builder                                                                                 |                            |               |
|--------------------------------------------------------------------------------------------------------|----------------------------|---------------|
| Project Title: Increasing First Run Parts From 60% to 90%                                              |                            |               |
| Build The Goal                                                                                         |                            |               |
| The goal of the project Is to: [Verb]                                                                  | Enter Increase of Decrease | Increase      |
| Product being measured [Product]                                                                       | Enter Product Type         | Material      |
| Measure for product unit [Unit Measure]                                                                | Enter Y Unit Measure       | Defect Rate   |
| Estimate baseline of measure [Baseline]                                                                | Enter Y Baseline           | 60%           |
| Estimate target of measure [Target]                                                                    | Enter Y Target             | 90%           |
| Estimate target due date [Target Date]                                                                 | Enter Estimate Due Date    | June 20, 2025 |
| Final Goal Statement: Decrease first run defect rate from 60% to 90% by end of second quater year 2025 |                            |               |
|                                                                                                        |                            |               |

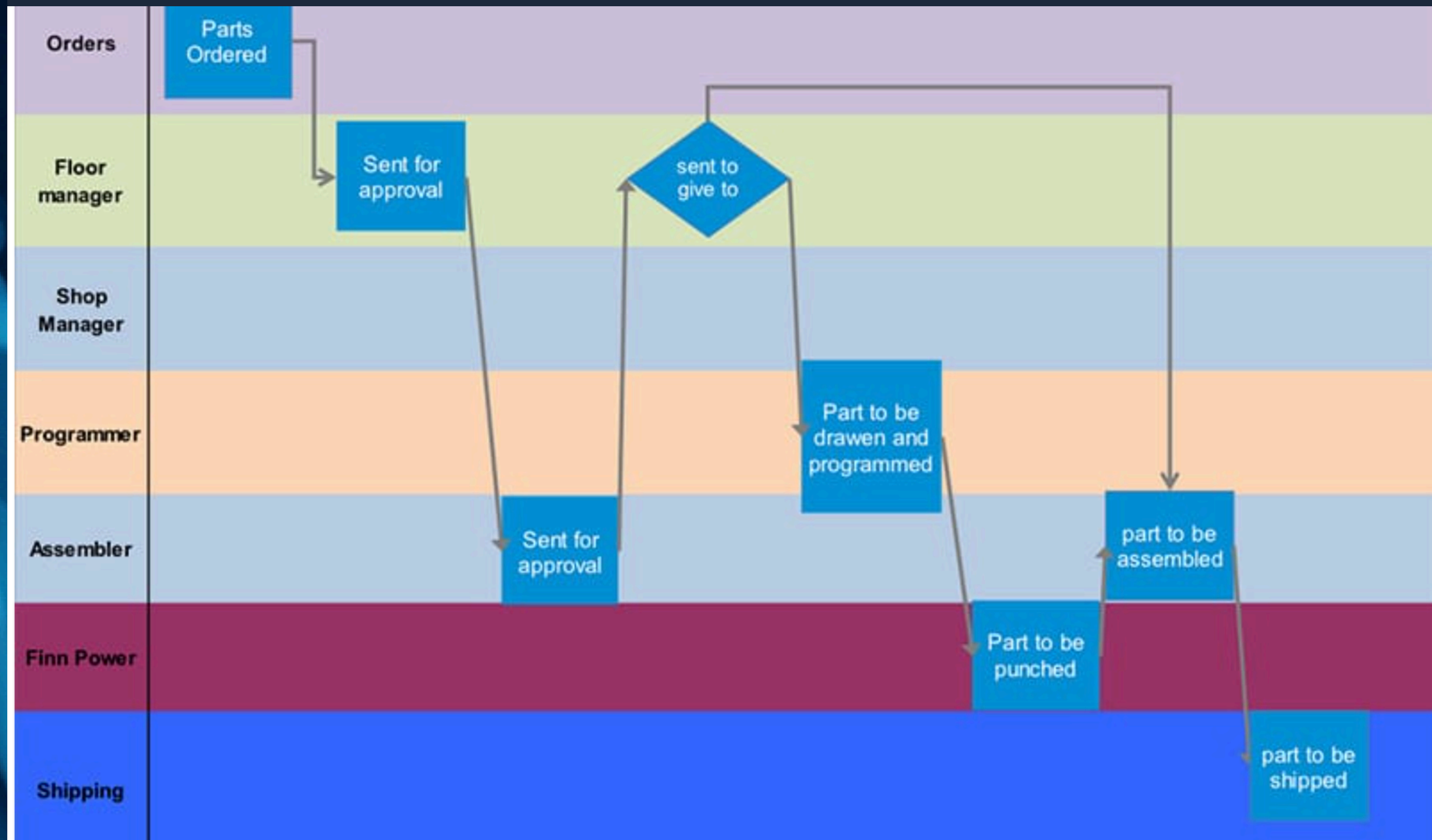
# SIPOC



Key Takeaway: The process was overprocessed, we had to take out two steps and move another step so the parts were not going to the same person twice.

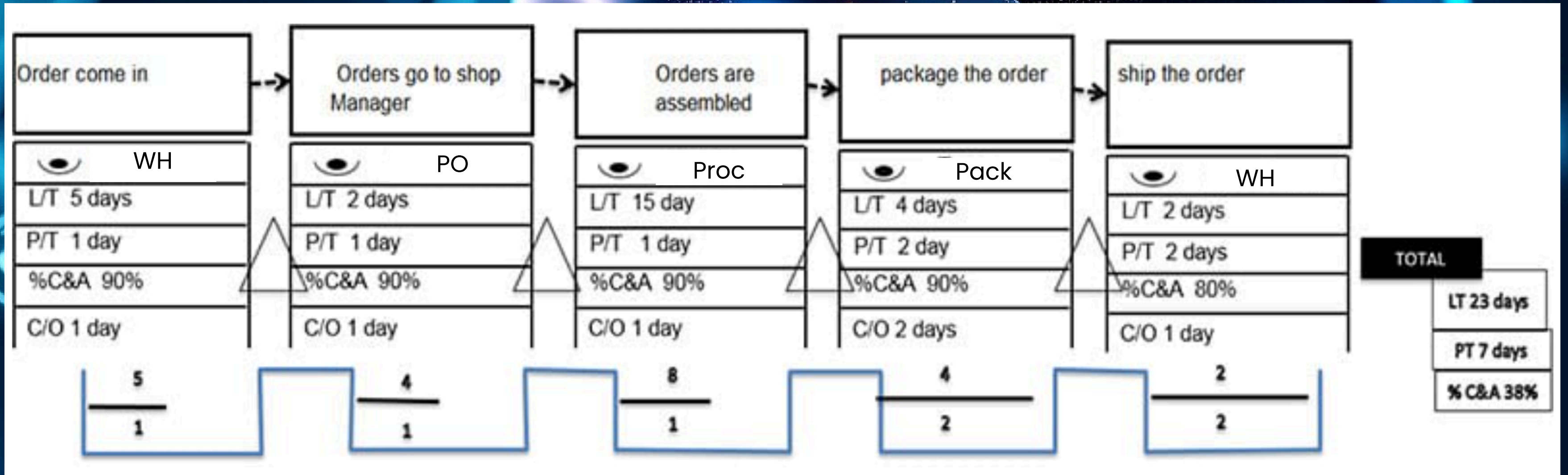
# AS-IS Detailed Map Segment

**Program Name: Increasing First Run Parts From 60% to 90%**

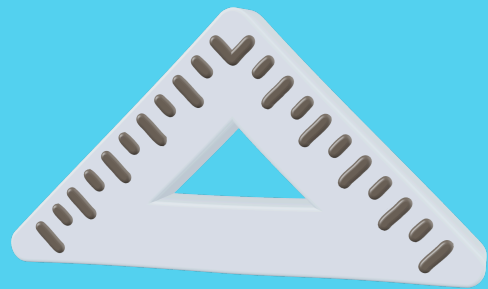


**Key Takeaway:** The team learned that there were extra steps in the process that could be eliminated (waste).

# Value Stream Mapping







# MEASURE

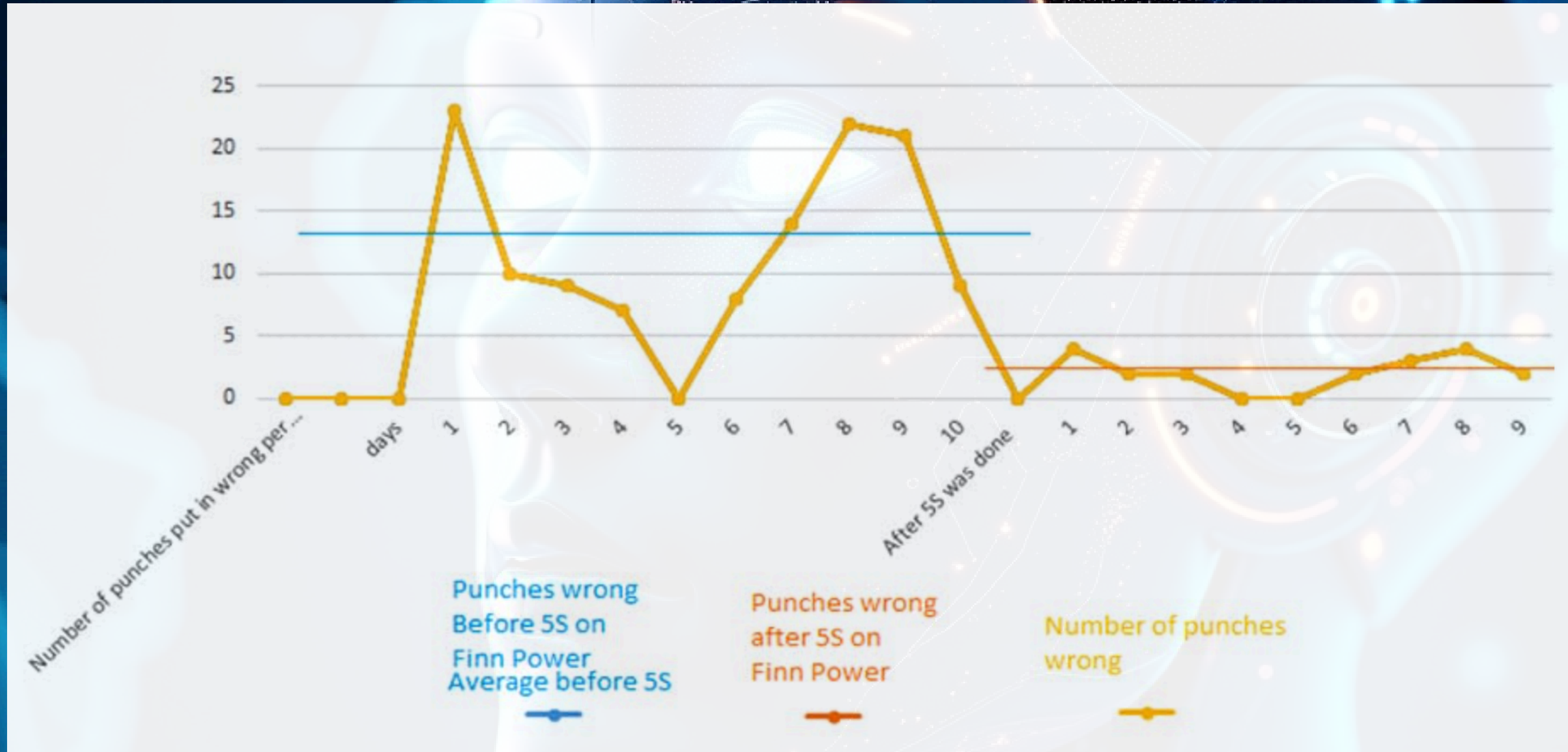
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# Data Collection Plan

| Measure                   | Data Type  | Operational Definition                                                                                                                                                                                                                                                          | Stratification Factors                                              | Sampling Notes                                                                                                                                                                                                                                                                                                                       | Who & How                                                                                                                                                                                                         |
|---------------------------|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Orders come in            | Continuous | Cycle time in days from the moment a customer orders to the moment the order is sent to the shop floor.                                                                                                                                                                         | By Order manager<br>By Floor manager<br>By sales calls.             | to 5 days. When the order manager is on sales calls or marketing or vacation there is no one that takes orders so this causes orders to back up and this creates bottle necks down the whole process.                                                                                                                                | When the order manager is out, the orders must keep moving now they get forwarded to secretary to fill orders, not really on one person to do all the work.                                                       |
| Orders go to shop manager | Continuous | Cycle time in days from the moment the orders are sent to the shop manager.                                                                                                                                                                                                     | by Floor manager,<br>by Assembler,<br>by Shop managers.             | Most days the orders are pushed through with in 2-4 days. On every order the shop manager would go to the shop manager and the assembler and gather information on what parts need made and what is in stock.                                                                                                                        | We set up an inventory system so the shop manager would not have to leave and stop process from moving forward, now all parts can be looked at from all computers. This stopped a lot of wasted time and process. |
| Finn Power process        | Continuous | There were many reworks being done in this area. We looked at the whole process and collected data for days on this process. We found that miscommunication and human error were most of the problem. We conducted a full 5S on this area and put up a white board for tooling. | Floor manager<br>Shop manager<br>Finn power operators<br>Programmer | There was also of that is how we have always done this. Once we started and things were set in place the reworks went way down we saved an average of \$18,000 weekly on just reworking parts. All the CNC operators now can find all tooling and all tooling in the machine is labeled for everyone to find quickly and accurately. | Everyone must put tooling in proper place and keep shadow board up to date. There is a check list for every operator to check. This added time before machines were started but save more time in the long run.   |
| Assembly process          | Continuous | The time the orders go to the assembler to the time, the assembler completes the order.                                                                                                                                                                                         | Programmer<br>Assembler                                             | The Assembler was looking at orders, then go collect of the items needs. This was keeping the assembler from getting added value to the process.                                                                                                                                                                                     | There was an materials handler hired to find what the parts needed per order and this picked up the process.                                                                                                      |



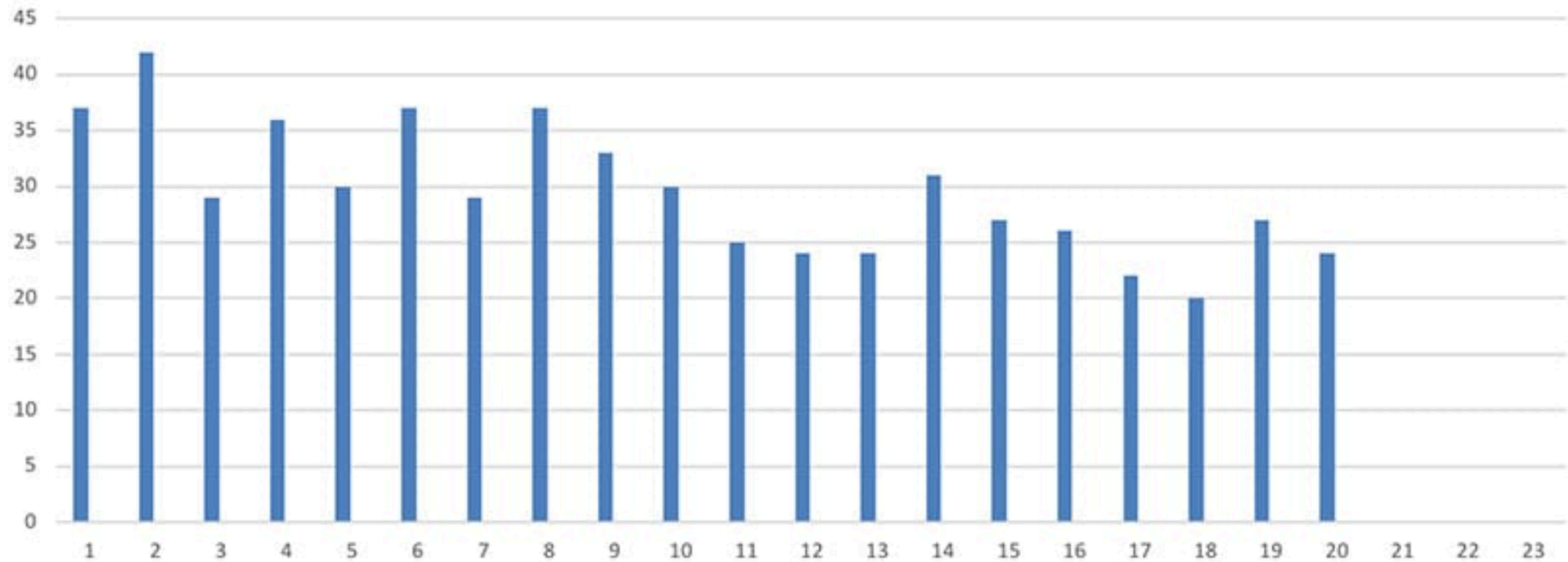
# Baseline Data – Project Y



**Key Takeaway:** Before (left side of chart): there were lots of mistakes being made. After (right side of chart): the defect went down from 12 defects per day to 2 defects per day. This was one of the biggest gains for the overall process.

- DPMO #: Start 87,968, after Lean: 15,015
- Sigma #: Start 0.4, after Lean: Sigma # is 3.4

# Baseline – Lead Time [Order]



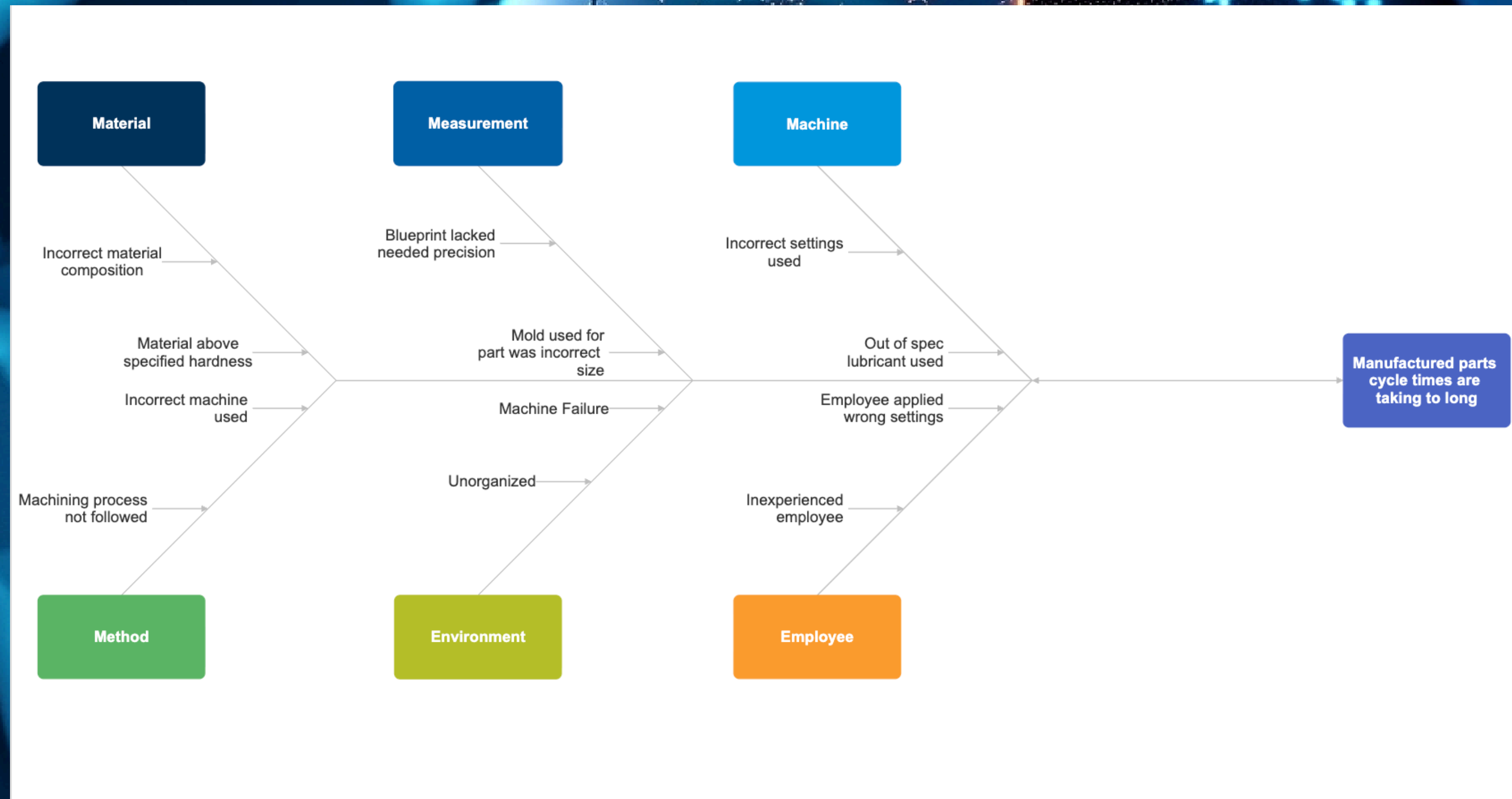
**Key Takeaway:** This chart reflects that working with Lean is efficiently making a positive difference in how long each order is in the process cycle. Emphasizing on the importance of lean methodologies in businesses. Instant amazing results!





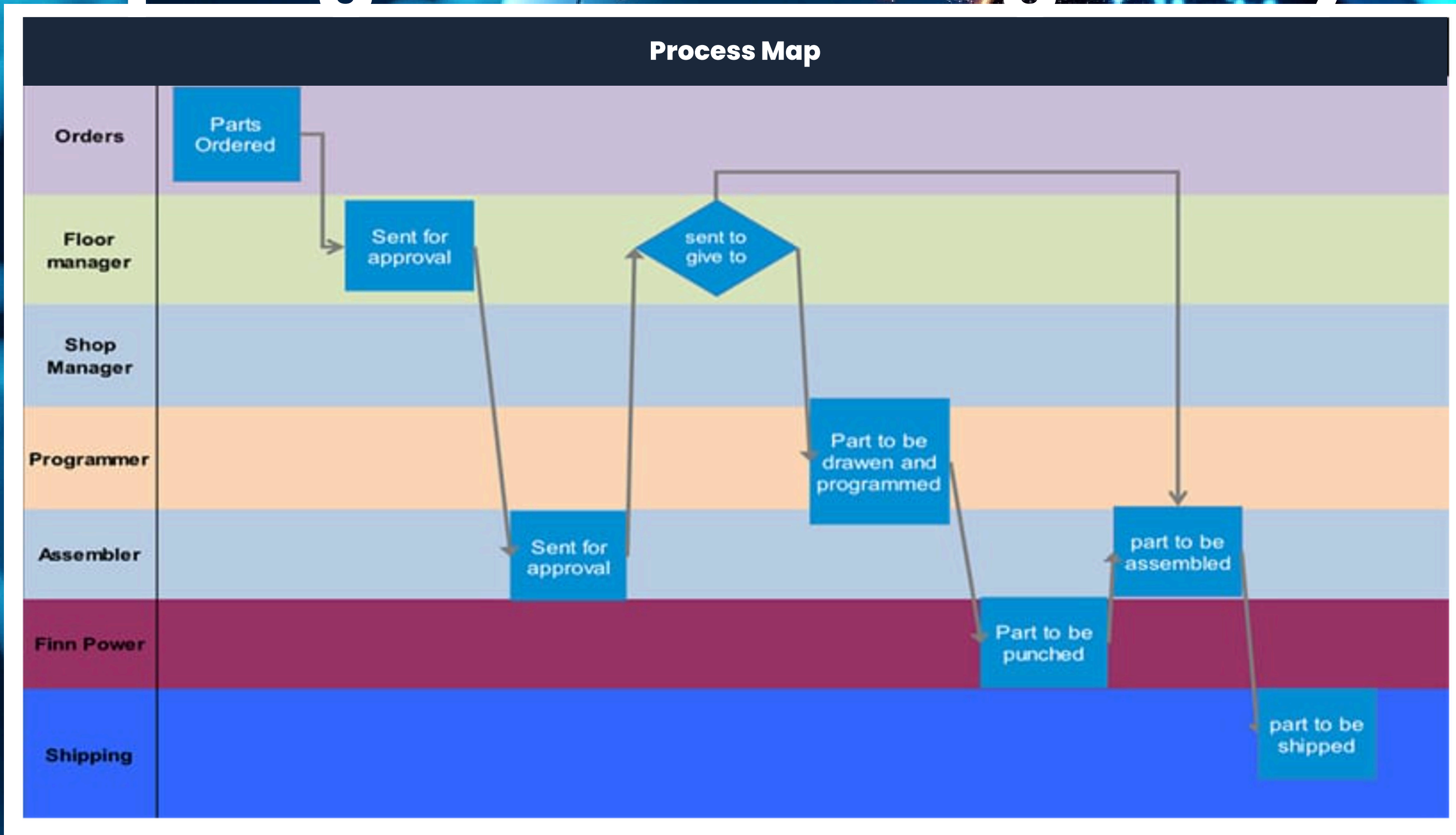
**ANALYZE**  
PHASE

# Fishbone Diagram



**Key Takeaway:** As a team brainstorming was conducted to discover how or what may be causing the order cycle process to take so long from start to finish.

# Map Segment Showing Analysis



**Key Takeaway:** Process analysis revealed a potential for removing time wasted within the approval state. Too many teams and individuals had to complete repetitive task during the production process.



# As-Is Detailed Map Segment

[illegible]

**Key Takeaway: A 5S effort showed the waste of motion – it also included assemblers which resulted in unnecessary increased employee engagement.**

# Value-Added Flow Analysis

**Name:** JDL

**Date:** 20Jan

**Process Name:** Order to Delivery

**Time Measured In:** days

Hours Days  
(select units)

| #  | Process Step                   | Step Label | Value Added Time | NVA/NVA-r Work Time | NVA Wait Time |
|----|--------------------------------|------------|------------------|---------------------|---------------|
| 1  | Orders come in to the business | NVA        |                  | 1                   | 4             |
| 2  | Orders went to floor manager   | NVA        |                  | 1                   | 3             |
| 3  | Orders go to assemblers        | NVA        |                  |                     | 2             |
| 4  | Orders got to shop manager     | NVA        |                  | 1                   | 2             |
| 5  | Orders go to programmer        | NVA        | 2                |                     |               |
| 6  | Orders go to shear             | NVA        | 1                |                     |               |
| 7  | Orders got to Finn Power       | NVA-r      | 4                |                     |               |
| 8  | Orders go to break             | VA         | 2                |                     |               |
| 9  | Orders go to assemblers        | VA         | 4                |                     |               |
| 10 | Orders go to packaging         | NVA-r      |                  | 3                   |               |

|                                          | Time | % of total |
|------------------------------------------|------|------------|
| Total Value-Added Work Time              | 13   | 43.33%     |
| Total Non-Value-Added or NVA-r Work Time | 6    | 20.00%     |
| NVA - Wait Time                          | 11   | 36.67%     |
| Total Cycle Time                         | 30   | 100.00%    |

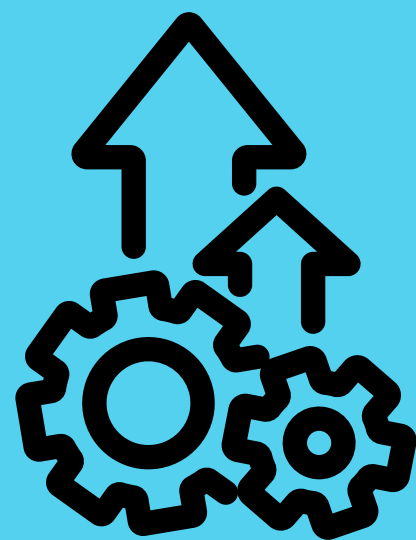
Key Takeaway: Biggest opportunity to remove wait time is the handoff between departments.



# Root Cause Hypothesis

| # | Possible Root-Cause (x)          | Root-Cause Hypothesis                                                                            | Result | Verification                                                         |
|---|----------------------------------|--------------------------------------------------------------------------------------------------|--------|----------------------------------------------------------------------|
| 1 | Order process                    | Orders to deliver take too long to go through process.                                           | TRUE   | See Histogram - Average is 32 days and target is 25 days.            |
| 2 | Assembler                        | The process did not need to go to the assembler two different times                              | TRUE   | See run chart - shows range of assembly time from 2 to 3 days        |
| 3 | Finn Power process (Wrong punch) | Set up a 5S of this area huge improvement.                                                       | TRUE   | See run data collection chart                                        |
| 4 | Machine Breakdown                | Maching downtime                                                                                 | FALSE  | There were very few process needing work here.                       |
| 5 | Wrong size                       | Part sheared wrong.                                                                              | FALSE  | after 5S the Finn Power area the parts became correct.               |
| 6 | Cross Training                   | Everyone had one job to do and there were little expereance knowing what process they could help | FALSE  | After running root cause annalises we found this is not the problem. |

**Key Takeaway:** Data shows that after brainstorming issues we were looking in the wrong direction. As you can see we narrowed down some of the issues to be addressed.



**IMPROVE**  
PHASE

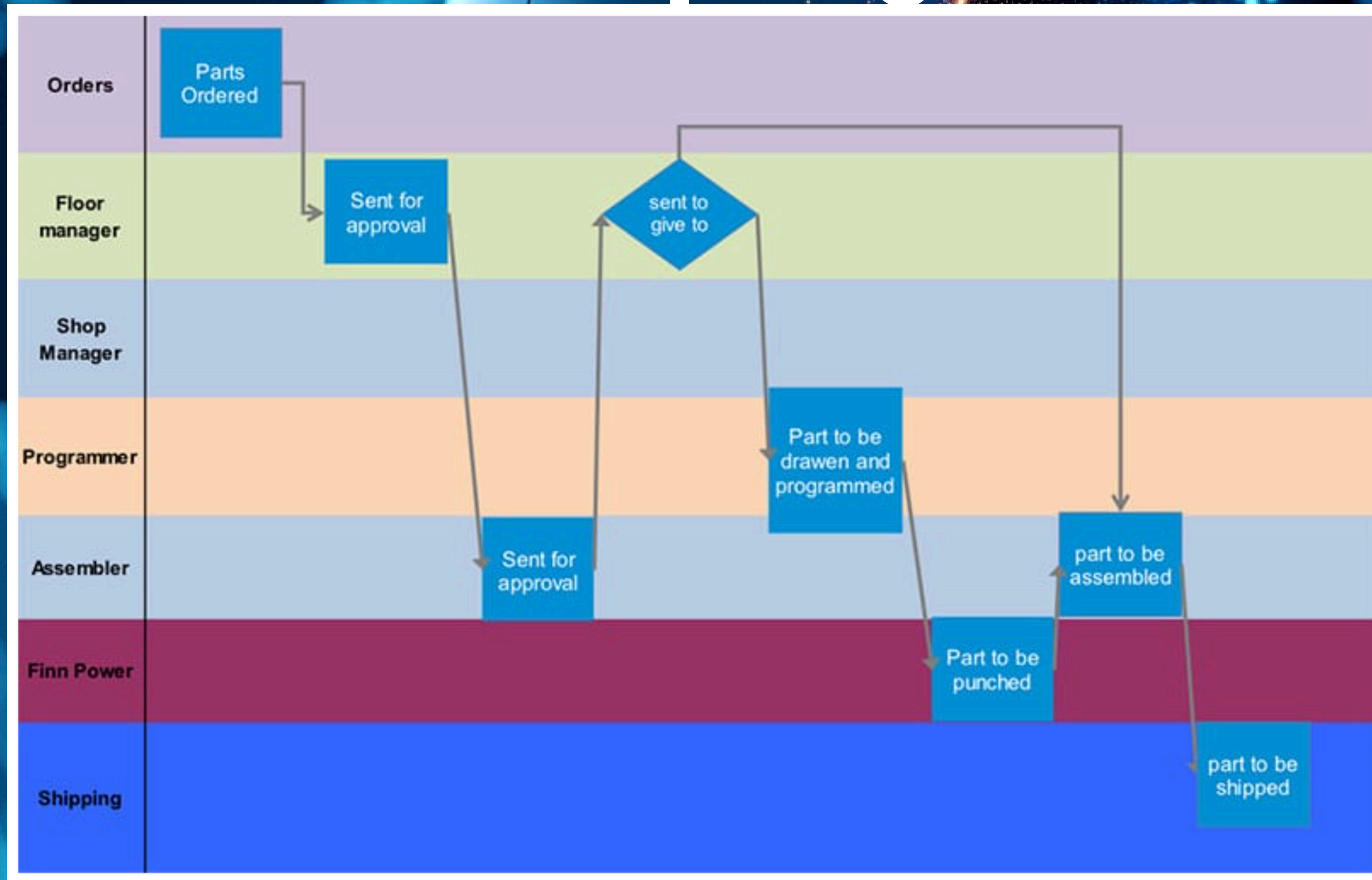


# Selected Solutions

| Solutions Selection Matrix                                                                        |                                                                                          |                                |                                                  |                       |                                                 |             |                      |
|---------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|--------------------------------|--------------------------------------------------|-----------------------|-------------------------------------------------|-------------|----------------------|
| Project Goal<br><i>Enter Goal Statement below:<br/>(As stated on Project Charter)</i>             | Please rank each solution for each criteria<br>by using the 1-5 Scale as indicated below |                                |                                                  |                       |                                                 |             |                      |
| <b><i>Deliver finished parts in and done right by 90%<br/>minutes by end of December 1st.</i></b> | Very Low<br>(less good)                                                                  | Moderate                       |                                                  | Very High<br>(best)   |                                                 |             |                      |
|                                                                                                   | 1                                                                                        | 2                              | 3                                                | 4                     | 5                                               |             |                      |
| Potential Solution<br>(Provide Brief Description)                                                 | Potential to<br>Meet Goal                                                                | Positive<br>Customer<br>Impact | Cost to<br>Implement<br>(1 = \$\$\$<br>& 5 = \$) | Stakeholder<br>Buy-in | Time to<br>Implement<br>(1 = Long<br>5 = Quick) | Total Score | Implement?<br>Yes/No |
| Weighted Criteria                                                                                 | 10                                                                                       | 9                              | 8                                                | 7                     | 5                                               |             |                      |
| Shadow Board                                                                                      | 5                                                                                        | 4                              | 5                                                | 3                     | 5                                               | 172         | Yes                  |
| Cross-Training for Finn power                                                                     | 5                                                                                        | 4                              | 3                                                | 3                     | 3                                               | 146         | Yes                  |
| Set up a white board for tooling in machine                                                       | 3                                                                                        | 3                              | 2                                                | 5                     | 2                                               | 118         | Yes                  |
| Get blue prints up to date                                                                        | 3                                                                                        | 3                              | 1                                                | 3                     | 2                                               | 96          | Yes                  |
| Blue print training                                                                               | 2                                                                                        | 2                              | 2                                                | 1                     | 2                                               | 71          | No                   |
| Add employee                                                                                      | 2                                                                                        | 1                              | 2                                                | 1                     | 2                                               | 62          | No                   |

**Key Take Away: There is no buy-in to reduce the take-out menu , so we first shifted our focus to effect cross training of staff to enhance the relationship stance with employees.**

# To-Be Map Segment



**Key Takeaway:** Process changes including restructuring the flow of parts and 5Sing the Finn Power area were the big ticket areas.

# Spaghetti Map

**Work Space:** Programming

**Process or Activity:** Flow of first time parts.

**Name:** JDL

**Date:** 10-JAN

| Process Step                  | Work Time | Walk Time | Distance Walked |
|-------------------------------|-----------|-----------|-----------------|
| 1 part come in                | 10        | 5         | 50              |
| 2 part went to shop manager   | 10        | 3         | 30              |
| 3 part wen to assembler       | 30        | 5         | 30              |
| 4 parts went to floor manager | 10        | 5         | 30              |
| 5 parts went to programmer    | 10        | 3         | 15              |
| 6 parts went to Finn power    | 20        | 6         | 150             |
| 7 parts went to assembler     | 25        | 6         | 50              |
|                               |           |           |                 |
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|                               |           |           |                 |

**Workplace Layout**  
(add equipment and furniture)

```

graph LR
    1[1] --> 2[2]
    2 --> 37[3,7]
    37 --> 4[4]
    4 --> 5[5]
    5 --> 6[6]
    6 --> 37
  
```

**Key Takeaway: By eliminating the assembler and the floor manager, we save an average of 1 day of wait time just by cleaning up the process.**

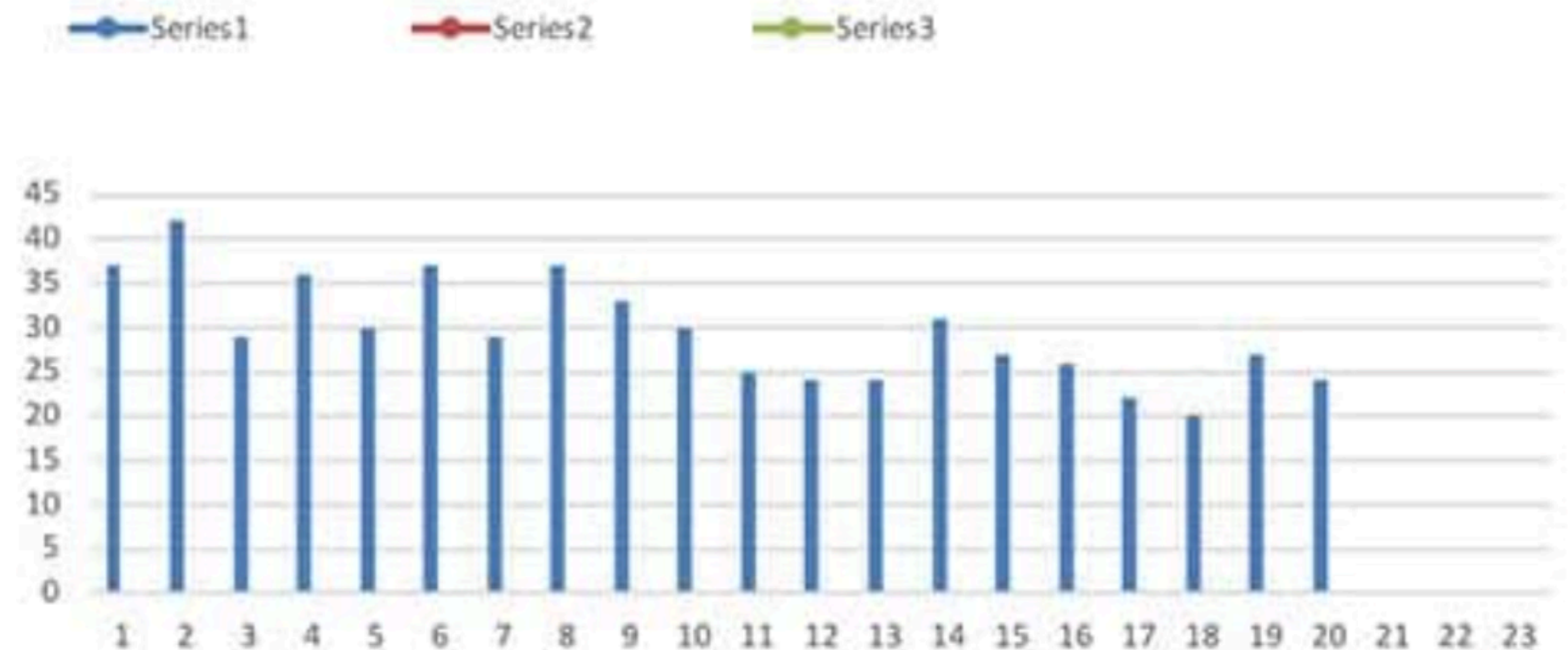
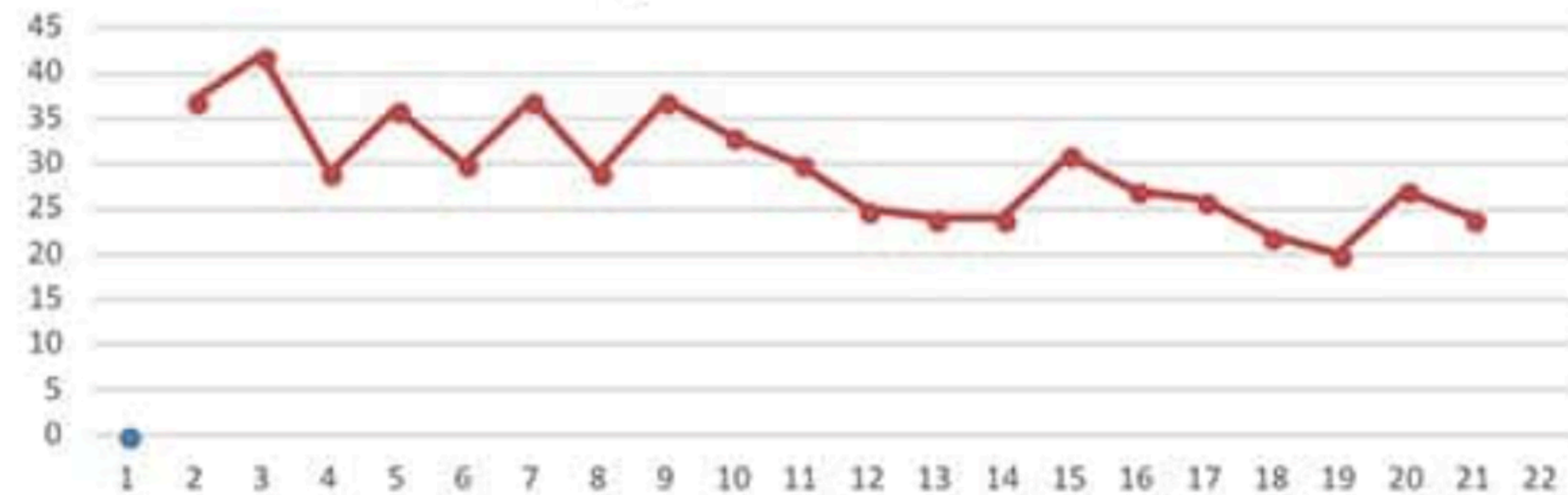


# Run Chart Showing Improvement

Days An Order Was In Process

|               | Start Order | Finish order | Days in process |
|---------------|-------------|--------------|-----------------|
| Order # 21126 | 25-Nov      | 1-Jan        | 37              |
| Order # 21127 | 25-Nov      | 6-Jan        | 42              |
| Order # 21128 | 25-Nov      | 24-Dec       | 29              |
| Order # 21200 | 1-Dec       | 5-Jan        | 36              |
| Order # 21201 | 1-Dec       | 30-Dec       | 30              |
| Order # 21202 | 1-Dec       | 6-Jan        | 37              |
| Order # 21203 | 1-Dec       | 29-Dec       | 29              |
| Order # 21250 | 5-Dec       | 10-Jan       | 37              |
| Order # 21251 | 5-Dec       | 6-Jan        | 33              |
| Order # 21252 | 5-Dec       | 3-Jan        | 30              |
| Order # 21300 | 10-Dec      | 3-Jan        | 25              |
| Order # 21301 | 10-Dec      | 2-Jan        | 24              |
| Order # 21302 | 10-Dec      | 2-Jan        | 24              |
| Order # 21350 | 14-Dec      | 13-Jan       | 31              |
| Order # 21351 | 14-Dec      | 9-Jan        | 27              |
| Order # 21352 | 14-Dec      | 18-Jan       | 26              |
| Order # 21400 | 4-Jan       | 26-Jan       | 22              |
| Order # 21401 | 4-Jan       | 24-Jan       | 20              |
| Order # 21402 | 4-Jan       | 31-Jan       | 27              |
| Order # 21450 | 10-Jan      | 3-Feb        | 24              |

Days In Process



**Key Takeaway:** Improvements had an significant impact on our day to day progress. Orders were in an active process stage throughtout the entire process cycle, from start to ship.



# CONTROL

PHASE



# Project Closure

## Lessons Learned

### Do's and Don'ts for Future Efforts

Remember to involve individuals from all aspects of the project.

Make sure you follow up frequently on process.

The 5S in a program seems to boost morale.

Boost self-esteem by letting everyone know how things are going good.

## Customer Impact

### Positive Impacts on External Customer

Employees morale is up, this make production is up.

Customers are not waiting on stoves.

## Final Calculations

### Hard Savings/Profit Increase

First run production scrap when down from 11 parts to 2 parts per day

company is saving and average of \$625 per week

stove wait time went from 30+ days to an average of 20 days.

### Soft Savings - Cost or Time

Staff by in has gone up.

By making changes in production, we are able to do more cross training.

## Process Owner Hand-Off

Has been informed of process changes:

Yes / No

Agrees to continued monitoring of new process:

Yes / No

Has received new process documentation:

Yes / No

## Project Sponsor Sihn-Off

After all the changes made from the top down, everyone feels more ownership of the new system things are going great. I am offically giving my stam of approval for documented improvements. James Fuhrman Green belt project.



# Appendix

- Insert Key Words on first slide of Appendix
- Include supporting documentation, process maps and data charts provide evidence of tool applications or helpful project background
- Add the “Key Take Away” for each slide
- DPMO # Start 87,968 after Lean 15,015
- Sigma # Start 0.4 after Lean our Sigma # is 3.4

# Key Words

- **Finn Power: CNC Punch Press Machine.**
- **Shop Manager: Leadership that oversees incoming/outgoing parts.**
- **Floor Manager: Leadership that assigns task to floor personnel.**
- **Programmer: Developer responsible for drawing parts and ensuring they can be punched on the Finn Power machine.**
- **Assembler: Associate responsible running Finn Power machines, gathering require material, and assembling parts.**
- **Brake Operator: Associate responsible for using the metal break machines to folds parts.**