

# Tray Pack Neuro Line Capacity Optimization

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## Introduction

Boston Scientific is a leading medical device company with over 40 manufacturing facilities and 15,000 products on the market. Its Dorado, Puerto Rico plant plays a key role in producing neuromodulation and cardiovascular health products, supporting the global mission to improve patients' lives.

## Problem Statement

The TP NMD project faces significant challenges in labor costs, space utilization, and capacity. Annual labor expenditures exceed \$60,000 due to overstaffing, with two additional staff members above the optimal level. Space availability is critically low, providing only 10% of the area needed for a projected 30% increase in operational demands. Furthermore, current capacity has increased by 15%, insufficient to cover the anticipated increase in demand by 2026.

## Product Description

### DBS Leads

DBS targets specific areas of the brain to relieve symptoms of conditions like Parkinson's and dystonia, while improving movement.

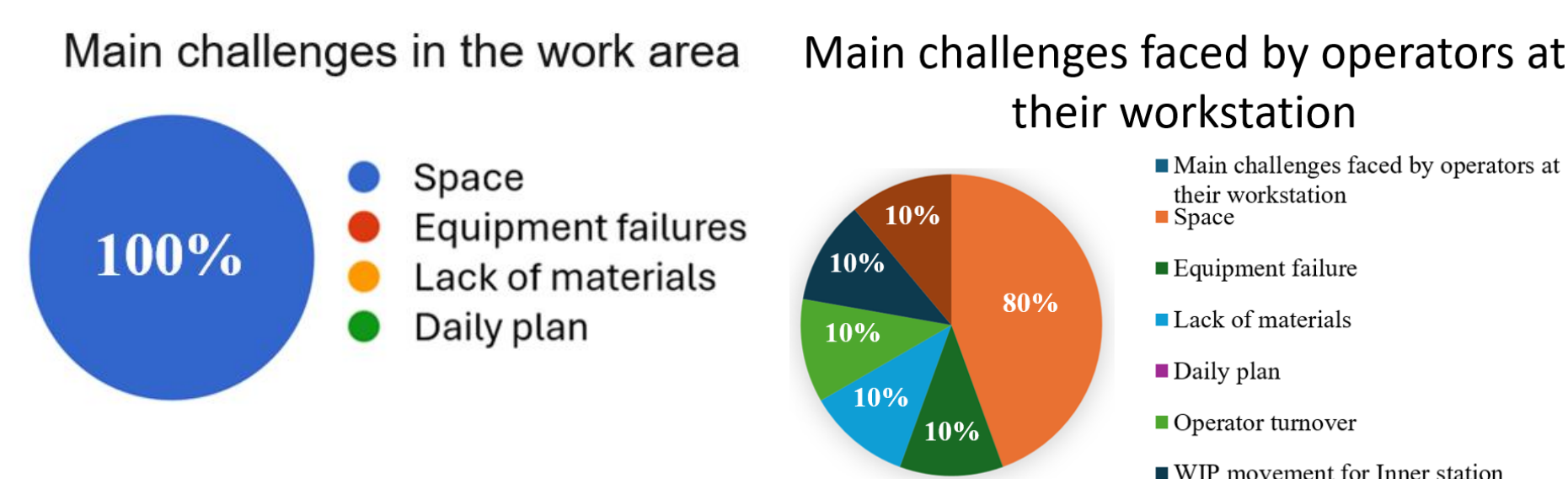
### SCS Leads

SCS interrupts pain signals in the spinal cord, effective in treating chronic pain in the back, arms and legs, such as in post-laminectomy pain syndrome.

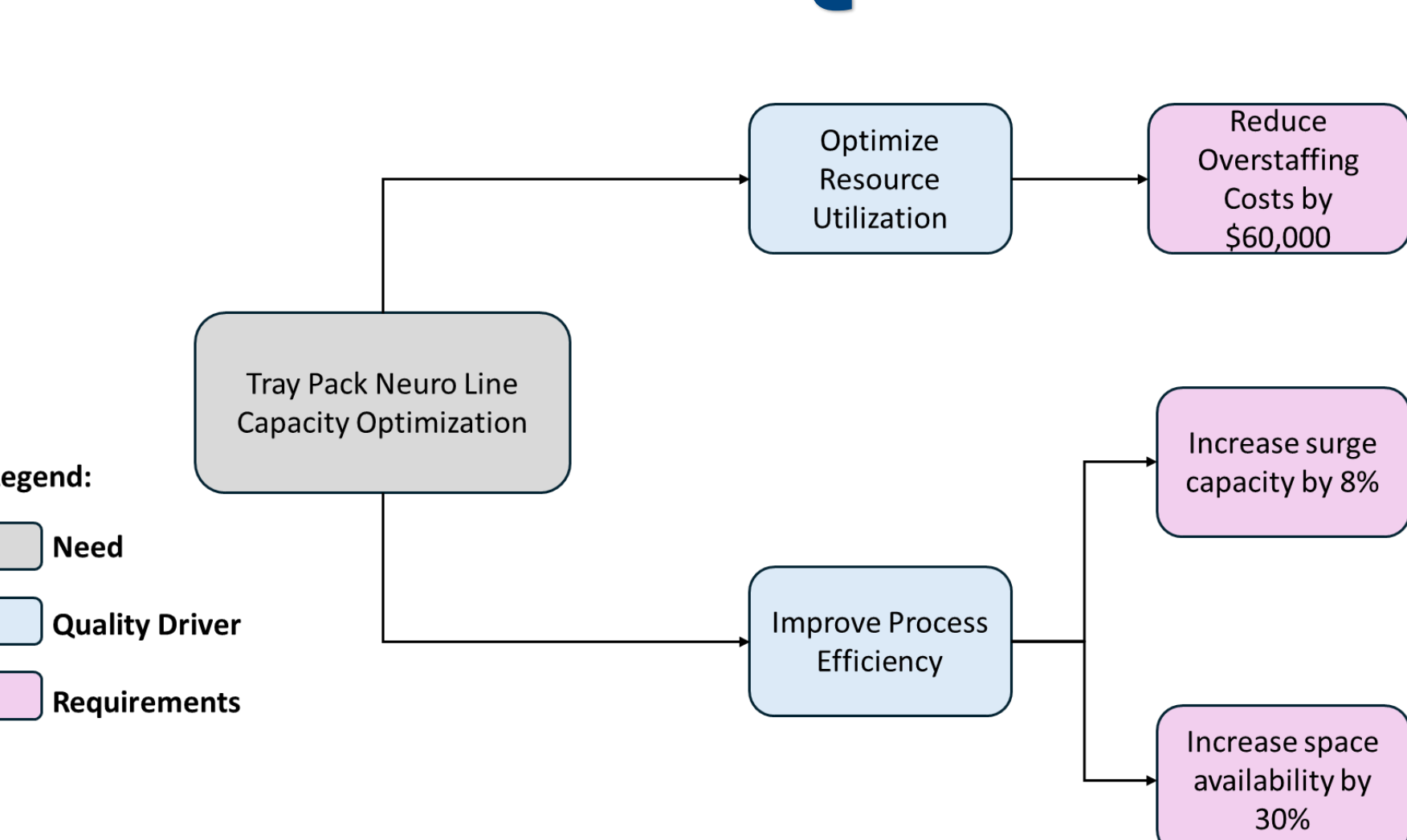
## Voice of the Customers

### SUPERVISORS

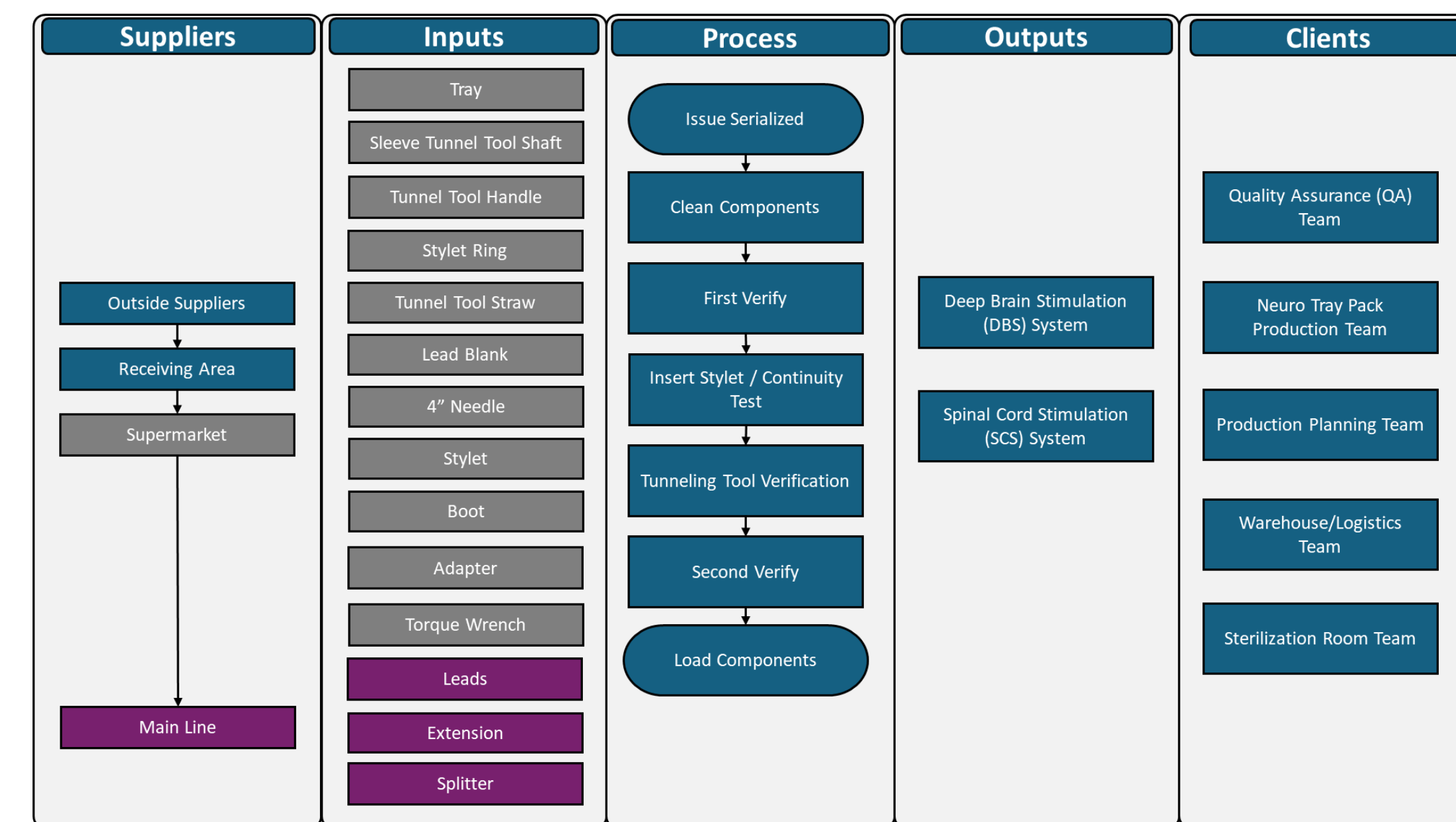
### OPERATORS



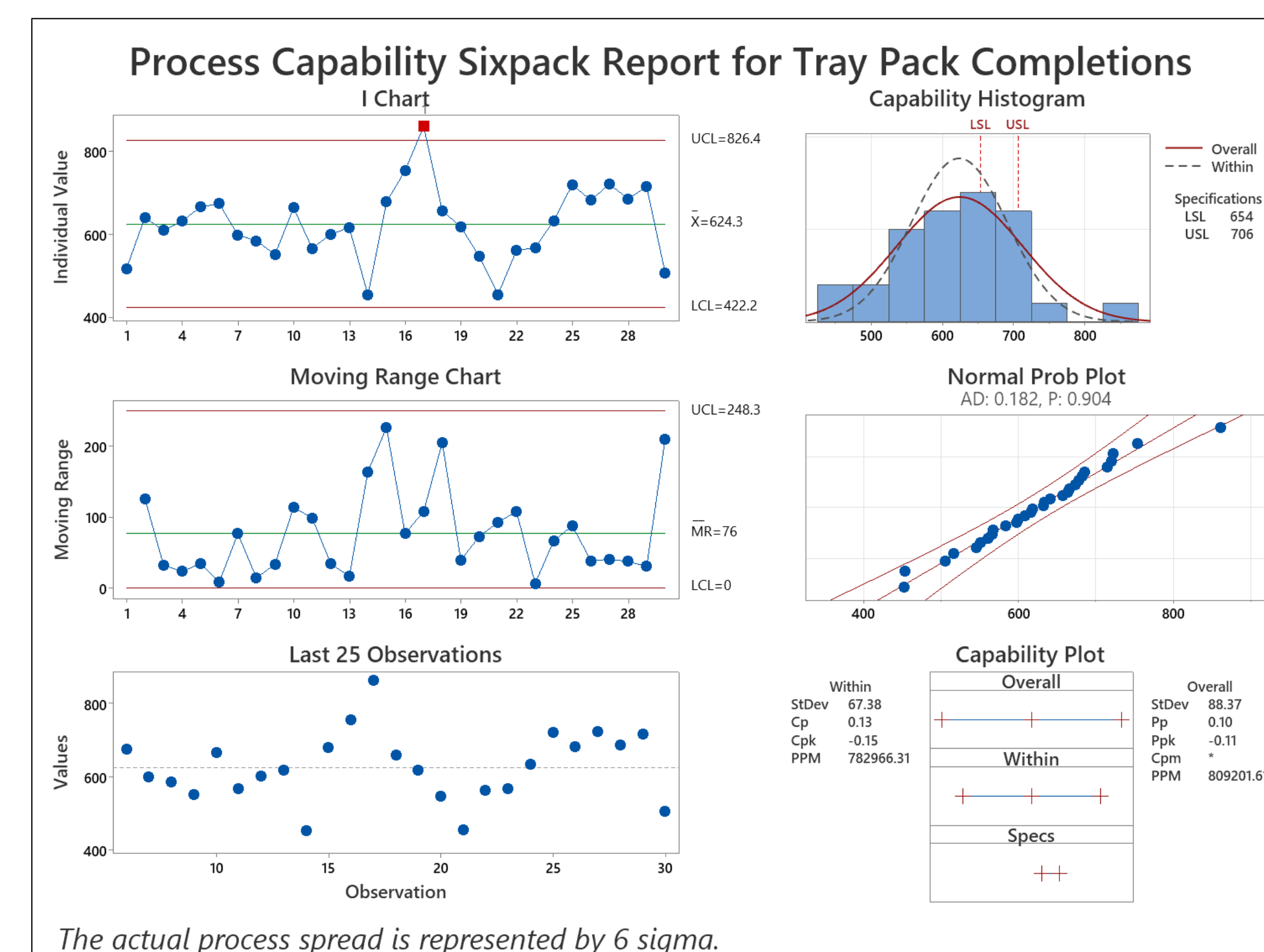
## CTQ



## SIPOC



## Process Capability



The capacity histogram shows significant variation with a lower specification limit of 654 units and an upper limit of 706 units, and a misaligned central curve indicating variability. The probability plot analysis confirms that the data follows a normal distribution with a probability value of 0.904. However, the process capability values (Cp of 0.13 and Cpk of -0.15) are below the expected, indicating that the process is not centered and cannot consistently complete the required units.

## Takt time

The Difference column shows whether each product is operating above or below the takt time. Positive values (green) indicate the process is faster than takt, while negative values (red) identify bottlenecks. Notably, Percs in both Issue Components and Load Tray.

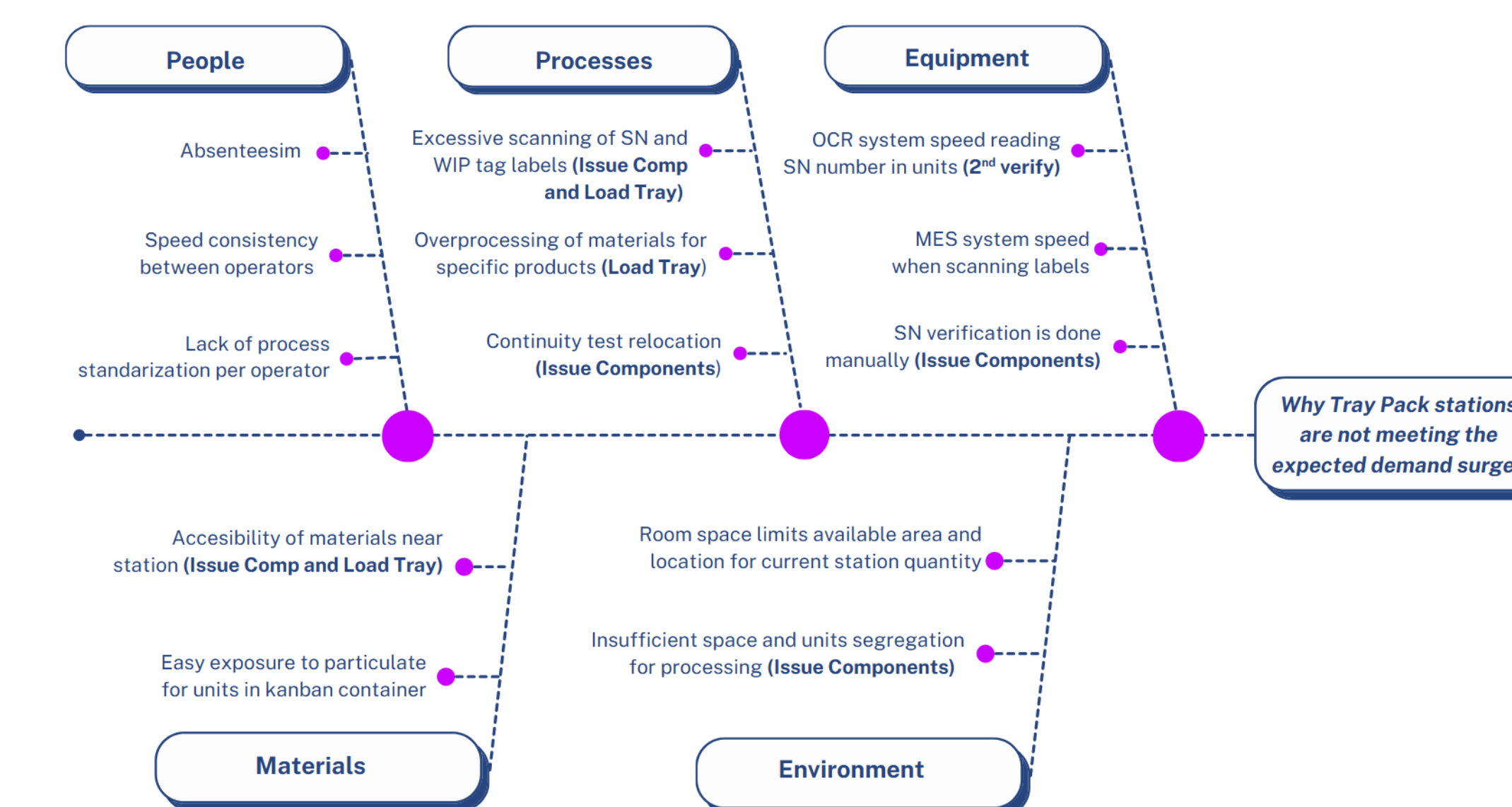
Station	Product	Standard Time	Takt per model	Difference
Issue Components	Extensions	42	48	6
	Percs	68	46	-23
	1x16	34	36	3
	Paddles	52	46	-6
2nd Verify	Paddles	35	46	11
	Splitters	29	48	19
	(Percs) Short tip 70cm	32	46	14
Load Tray	1x16	32	36	4
	Percs	11	46	34
	Percs (W/ Stylet ring)	66	46	-20
	Paddle	20	46	26
	Splitters & Extensions	22	48	26

## Number of resources

Station	Number of PBs needed	Current PBs amount	Difference
Issue Components	3	4	1
2nd Verify	1	2	1
Load Tray	1	2	1
	<b>5</b>	<b>8</b>	<b>3</b>

Each station operates with one PB above the optimal staffing level. With each PB costing \$30,000 annually, this results in a total potential labor overspend of \$90,000 per year.

## Cause and effect

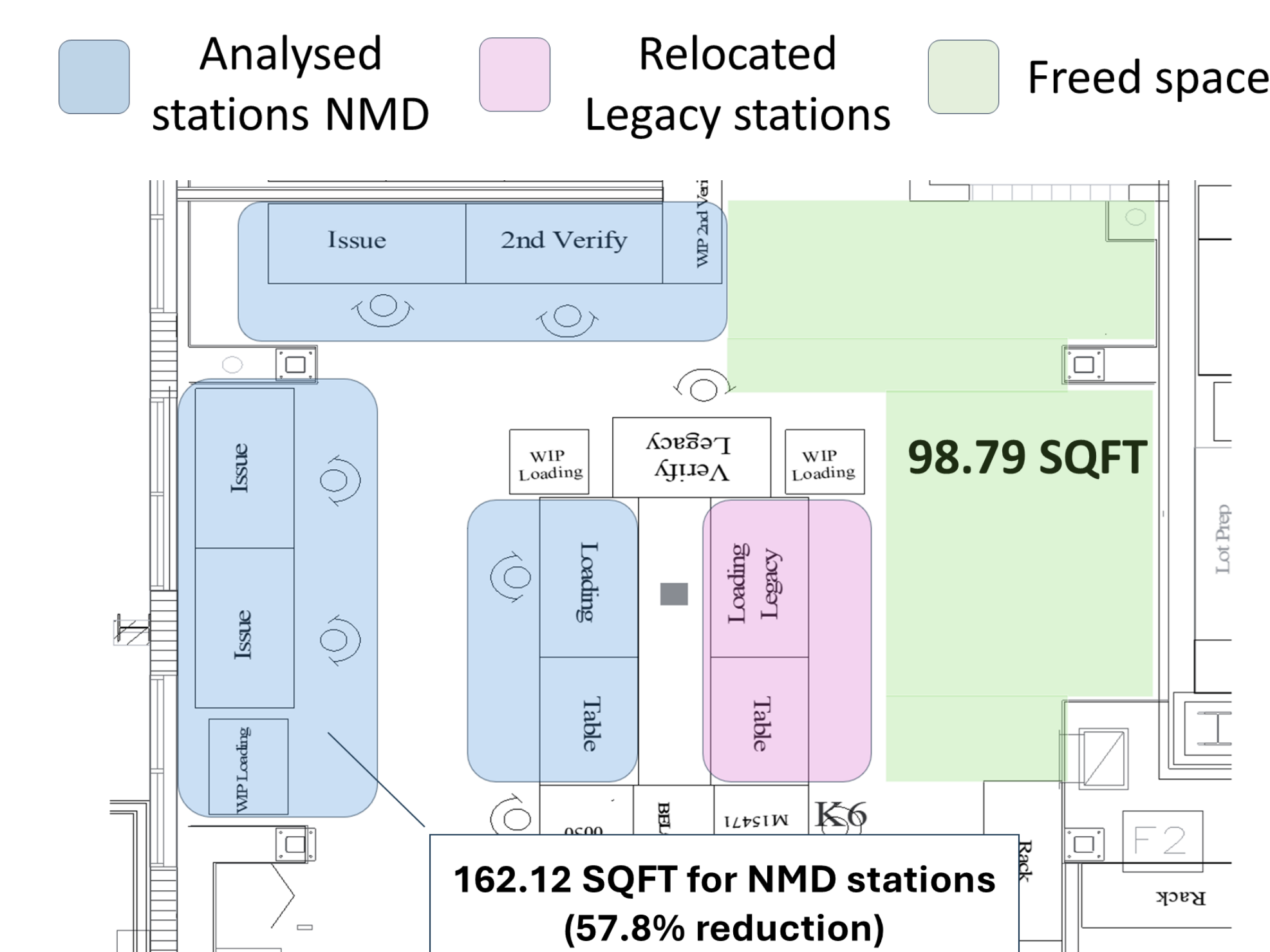


## Proposed solutions

- Issue Components**
  - Purchase three additional OCR equipment units. The recommended OCR equipment is the Keyence IV4 Series.
- Second Verify**
  - Acquire fitted lids for existing containers to prevent contamination.
  - Implement a sampling-based approach for the verification process.
- Load Tray**
  - Change dimensional specifications on the tunnel tool straw.
  - Consolidation of scans in the station.

The following summarizes the proposed improvement actions for the Issue Components, Second Verify, and Load Tray stations. Each solution targets specific inefficiencies, aiming to reduce processing time, improve product handling, and enhance overall workflow performance.

## Proposed layout



## Solutions impact

Station	Product	Standard Time	Standard Time w/ Improvements	Takt per model	Difference	Difference w/ Improvements
Issue Components	Extensions	42	25	48	6	23
	Percs	68	51	46	-23	-6
	1x16	34	17	36	3	20
	Paddles	52	35	46	-6	11

## Financial analysis

The following table presents a cost-benefit analysis for the proposed improvements across various stations. It outlines key metrics such as investment, time savings, labor cost reductions, and expected annual savings, and estimated payback period.

Stations	Improvement	Investment/ Cost	Quantity (each)	Time saved (sec/unit)	Labor Savings/ Unit	Volume (units/year)	Annual Savings	Payback period
Issue Components	OCR equipment (KEYENCE IV4 Series)	\$19,500	3	10	\$0.10	176,500	\$17,903	1.17 years
Second Verify	Protective lids for the existing containers	\$96	12	6	\$0.02	176,500	\$3,530	0.027 years
Load Tray	Tunnel Tool Straw spec change	\$0	N/A	2.5	\$0.01	29,500	\$612	0 years
	Handling Unit	\$0	N/A	2.5	\$0.01	176,500	\$3,662	0 Years

## Implementation Plan

Station	Recommended Improvement	Implementation Highlights	Sustainability Measures	Gantt Chart Duration
Issue Components	OCR system for SN verification	8-phase rollout: planning, install, MES integration, training, pilot test, validation, go-live, sustainability	SOPs, OCR vendor SLA, monthly monitoring	8 weeks (plus ongoing review)
Second Verify	Sampling plan & protective lids	6-phase rollout: planning, SOP development, pilot test, training, go-live, audit & monitoring	SOPs, sampling audits, contamination control protocol	8 weeks (plus monthly audits)
Load Tray	Straw spec change & HU traceability	6-phase rollout: spec review, supplier approval, FAI, training, go-live, SOP & supplier performance reviews	SOPs, traceability audits, supplier feedback	6 weeks (plus supplier review)

## Conclusion

The Tray Pack Neuro Line Capacity Optimization project at Boston Scientific effectively applied the DMAIC methodology to address critical limitations in labor, space, and throughput. Time studies and statistical analysis revealed that the line's average daily output of 624.3 units fell short of the 654-unit demand, with high variability showing the process was neither capable nor centered. Key bottlenecks included a 234-second cycle time for Percs in Issue Components and a 189-second cycle in Load Tray for Percs with stylet rings. Second Verify also showed delays in serial number verification of up to 20.8 seconds per unit. VOC and operator feedback highlighted space constraints and excessive manual tasks. These findings informed solutions such as layout redesign, ergonomic improvements, and automation to support a 37.1% capacity increase, \$115,797 in labor cost savings (-3 PBs) and a space occupation reduction of 57.8%.

## Acknowledgements

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