I2.1 – Cycle Time Reduction through Kanbans

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Problem Statement

The current material picking and movement process contributes to internal waste, complexity, and long customer lead times.

Project Purpose

The project will reduce average picking times for semi-finished goods (SEMIs) within Signify's internal supply chain, specifically materials flowing out from fabrication areas to final assembly.

Objectives

Reduce the average pick time of SEMIs that go from fabrication to assembly by 50% through:

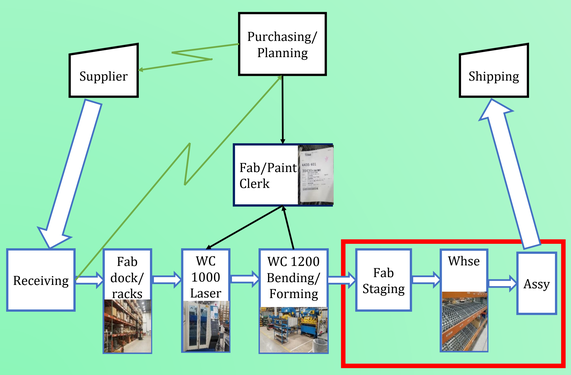
- Implementation of supermarket area for SEMI parts.
- Implementation of Kanban system for high running SEMIs coming out of fabrication.

Previous State

Vacant Area

Previous Kanban

Previous Value Stream Map



Methodology: Lean Six Sigma DMAIC

DMAIC is data-driven quality strategy from Lean Six Sigma used to improve processes, in this case, material picking. DMAIC stands for Define, Measure, Analyze, Improve, and Control.

Measure

Time Studies

Sequence	Large Category	Activity Category	Start Task (h:mm:ss)	Task Element	End Task (h:mm:ss)	Time (h:mm:ss)
14	Required Waste	Pick Parts	0:02:57	Place parts in order bin	0:02:58	00:01
15	Required Waste	Walking	0:02:58	Walk from cart to bin	0:03:01	00:02
16	Required Waste	Pick Parts	0:03:01	Pick parts from bin	0:03:03	00:03
17	Required Waste	Counting	0:03:03	Count Parts	0:03:14	00:10
18	Required Waste	Pick Parts	0:03:14	Pick parts from bin	0:03:16	00:02
19	Required Waste	Walking	0:03:16	Walk from bin to cart	0:03:18	00:02
20	Required Waste	Pick Parts	0:03:18	Place parts in order bin	0:03:19	00:01
21	Pure Waste	Idle Time -Waiting	0:03:19	Wait	0:03:53	00:34
22	Required Waste	Walking	0:03:53	Walk from KB to FOF Rack	0:05:28	01:35

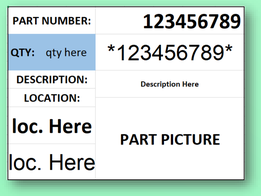
Weights and Pictures

- Weights were taken to determine bin quantities, pictures were for the labels.

Improve

Supermarket Area

Label Template



Example of Label

Factors used to Determine Bin Quantities

- 2018 demand
- Frequency of order
- Size, volume, and weight
- Optimization of aluminum sheet utilization

#	Part	Kanban	Qty.
1	443560001590	Kanban	50
2	443560001620	Kanban	50
3	443560001770	Kanban	30
4	443560003040	Kanban	50
5	443560010730	Kanban	100
6	443560010740	Kanban	100
7	443560014121	Kanban	50
8	443560014190	Kanban	50
9	443560014200	Kanban	50
10	443560014520	Kanban	36
11	443560025220	Kanban	50
12	443560048020	Kanban	50
13	443560051530	Kanban	30
14	443560052180	Kanban	50
15	443560052280	Kanban	40

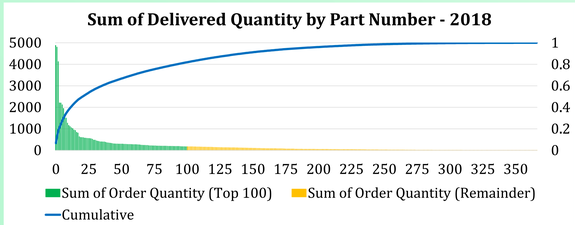
Analyze

Demand Analysis

Row Labels	Count of Order	Sum of Order quantity	Avg Demand/ Month	Old Kanban?	Count Score	Qty Score	Score	Rank
443560111880	32	4800	400	TRUE	0.914285714	0.98400984	0.966579	1
443560084130	17	4878	406.5	TRUE	0.485714286	1	0.871429	2
443562887290	20	4127	343.9166667	TRUE	0.571428571	0.84604346	0.77739	3
443562885930	35	2205	183.75	TRUE	1	0.45202952	0.589022	4
443560099350	61	2121	176.75	FALSE	1	0.43480935	0.576107	5
443562899500	28	2207	183.9166667	TRUE	0.8	0.45243952	0.53933	6
443560084740	17	1949	162.4166667	FALSE	0.278688525	0.399549	0.369334	7
443560025220	20	1159	96.58333333	TRUE	0.571428571	0.23759738	0.321055	8
443562890340	10	1602	133.5	TRUE	0.285714286	0.32841328	0.317739	9

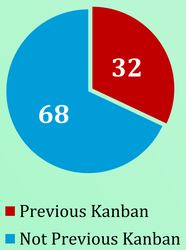
- Score= Count Score*0.25+Qty Score*0.75
- Parts were ranked based on both their demand and their ordering frequency in 2018.

Pareto Analysis

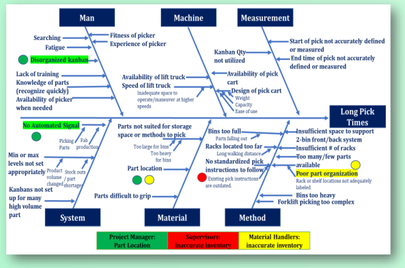


- Focus on top 100 parts based on racks' capacity.

Selected Kanban Parts



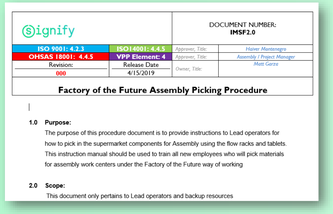
Ishikawa Diagram



Control

- Material handling and Kanban procedures were modified to integrate the supermarket.
- SAP was updated with Kanban quantities.

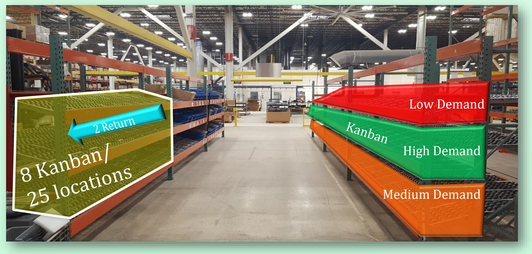
Material Handling Procedure



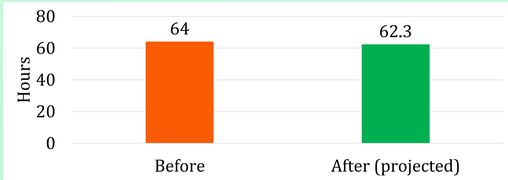
Results

Supermarket

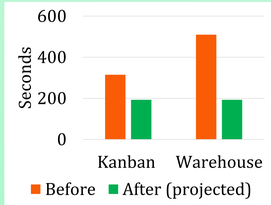
- Each part slot has a unique identifier in SAP.
- Parts storage ergonomics considered.



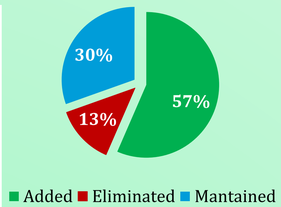
Cycle Time



Picking Times



Kanban changes



Design Team Members

Acknowledgments

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