



OPTIMISATION OF PRODUCTION LINES USING LEAN PRICEABLE, SIMULATIONS AND AUTOMATION

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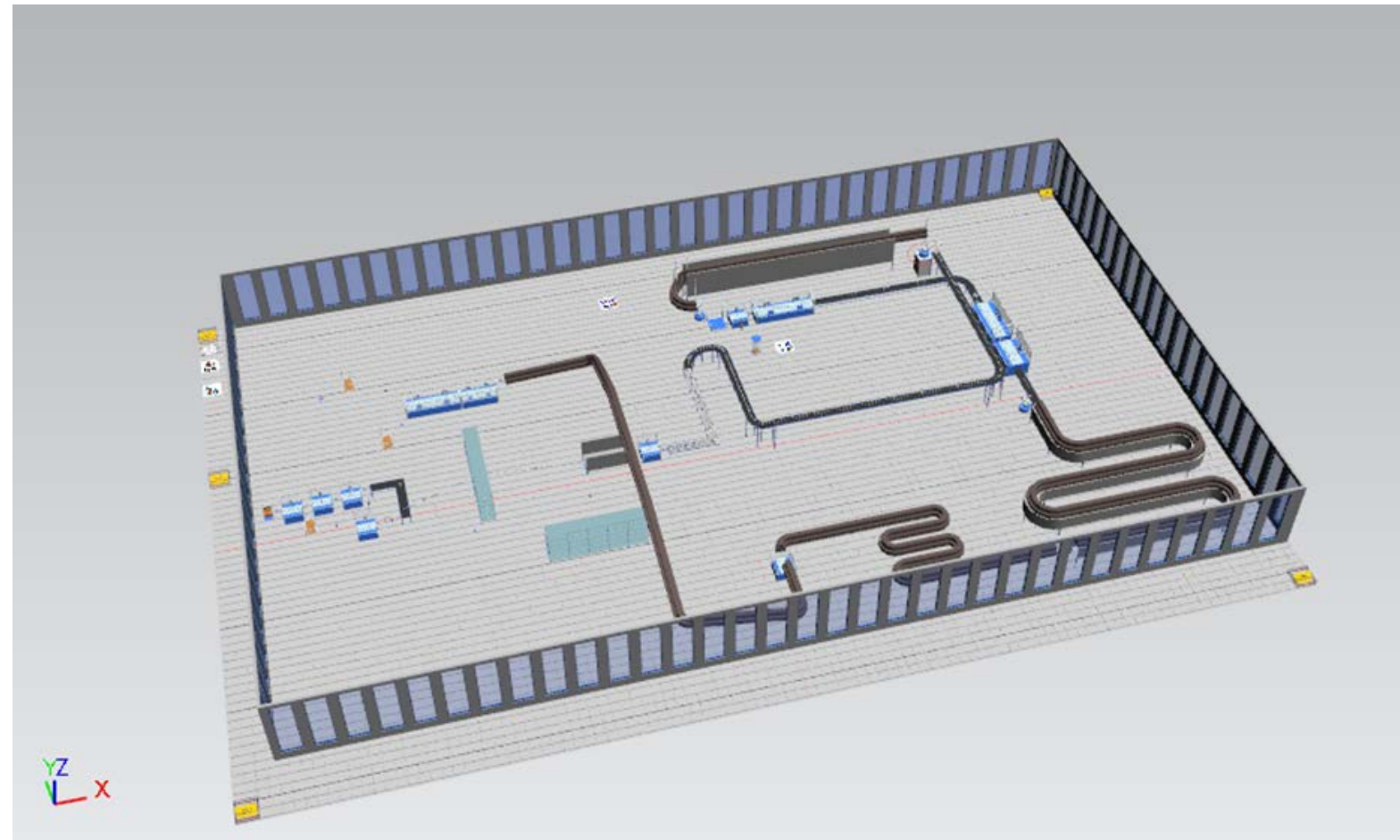
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Introduction

This report aims to discuss techniques that are commonly used in industry to optimise a production line, then coupling these techniques with higher levels of mechanisation to further improve the line and reduce the overheads of the facility and in turn boosting profits.

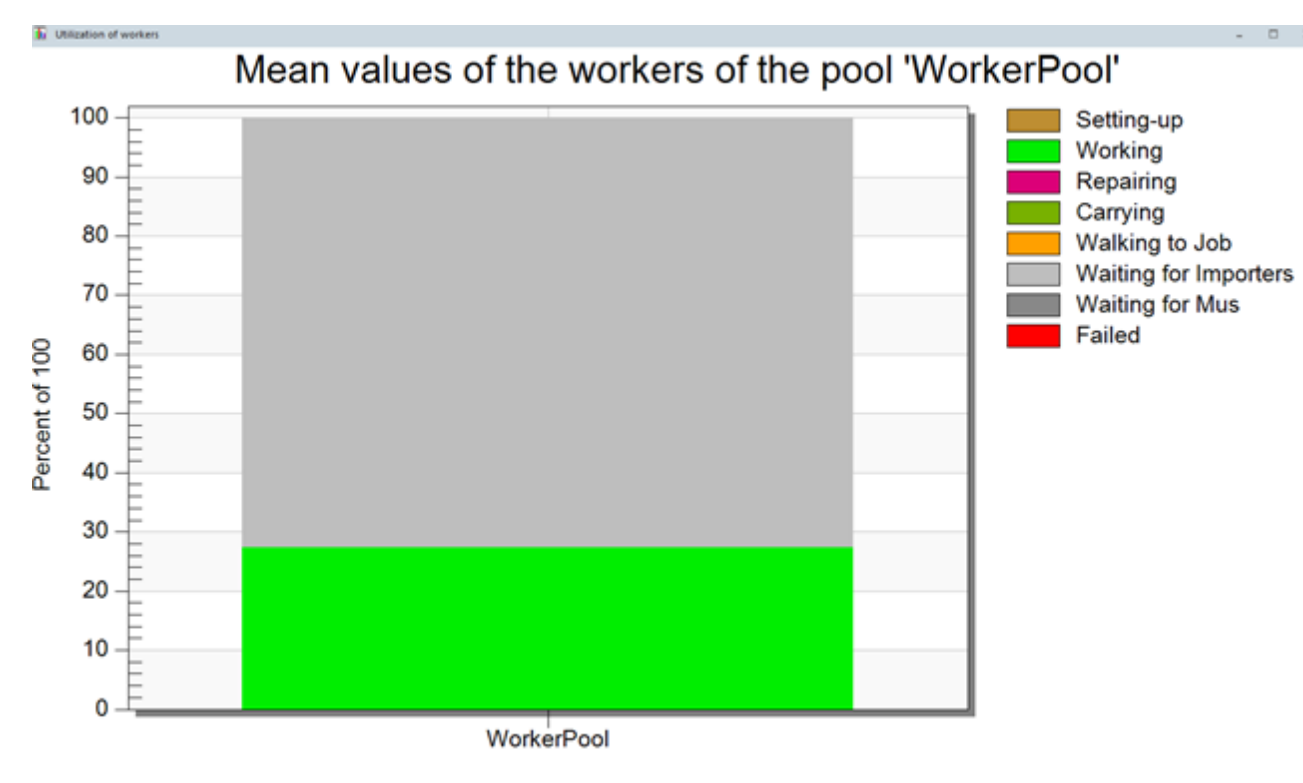
This report will use Allevard Springs as a case study and will discuss in detail their production line. It will then identify weakness in their production line or supply chain, and then suggest improvements that could result in increasing their profit margins.



Above is an image of the simulated plant. This plant in the moment of this image is in a state of change over.

Object	Working	Set-up	Waiting	Blocked	Powering up/down	Failed	Stopped	Paused	Unplanned	Portion
AngularConverter	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Buffer	0.00%	0.00%	67.17%	32.83%	0.00%	0.00%	0.00%	0.00%	0.00%	
Conveyor	92.91%	0.00%	0.00%	0.00%	0.00%	7.09%	0.00%	0.00%	0.00%	
Conveyor1	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Conveyor10	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Conveyor2	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Conveyor4	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Conveyor6	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Conveyor7	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Conveyor71	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Conveyor8	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Conveyor9	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Drainfail	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Drainscrap	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Drainship	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
PickAndPlace	34.76%	0.00%	9.67%	55.55%	0.00%	0.00%	0.00%	0.00%	0.00%	
PickAndPlace1	14.73%	0.00%	54.24%	31.03%	0.00%	0.00%	0.00%	0.00%	0.00%	
PickAndPlace2	23.73%	0.00%	76.27%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Source	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
Station82	4.66%	0.00%	94.15%	0.25%	0.00%	0.92%	0.00%	0.00%	0.00%	
Store1	0.00%	0.00%	9.73%	90.27%	0.00%	0.00%	0.00%	0.00%	0.00%	
Store2	0.00%	0.00%	9.71%	90.29%	0.00%	0.00%	0.00%	0.00%	0.00%	
WorkerPool	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
bar_cleaner	36.81%	0.00%	0.00%	63.19%	0.00%	0.00%	0.00%	0.00%	0.00%	
bar_cutter	36.81%	0.00%	0.00%	63.19%	0.00%	0.00%	0.00%	0.00%	0.00%	
coiling	47.30%	0.00%	12.10%	27.26%	0.00%	13.35%	0.00%	0.00%	0.00%	
drawer_bar	36.81%	0.00%	0.00%	63.19%	0.00%	0.00%	0.00%	0.00%	0.00%	
finaltest	15.57%	0.00%	84.43%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
heat_treating	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
manned	26.06%	0.00%	38.72%	30.14%	0.00%	5.09%	0.00%	0.00%	0.00%	
packing	7.78%	0.00%	92.22%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
perload_comperion	4.69%	0.00%	74.53%	15.34%	0.00%	5.44%	0.00%	0.00%	0.00%	
pre_heater	85.48%	0.00%	0.00%	0.00%	0.00%	14.52%	0.00%	0.00%	0.00%	
shotpen1	16.41%	0.00%	50.48%	16.05%	0.00%	17.07%	0.00%	0.00%	0.00%	
shotpen2	9.37%	0.00%	66.64%	1.11%	0.00%	22.88%	0.00%	0.00%	0.00%	
xray	24.54%	0.00%	75.46%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	

This table shows the effectiveness of each process in the production line.



This table shows the effectiveness of a manned opinionation

Below is a table showing the time to pay back for a stranded industry robot if it was to replace a manned operation.

	number of staff members	cost of staff per hour	number of robots	unit price	
no robots	2	£10	0	£45,000	
1 robot 1 worker (current set up)	1	£10	1	£45,000	
fully automated (2 robots no workers)	0	£10	2	£45,000	
	kwh usage	cost per kwh	hour till payback	days till payback	cost of staff
1 robot 1 worker (current set up)	22	£0.15	0	0	£138,246.612557
fully automated (2 robots no workers)	22	£0.15	7276.137503	303.172396	£69,123.306279
	22	£0.15	7276.137503	303.172396	0

This report found there was some significant short comings in Allevard's production line primarrery coming from there need to over enginer there product and the massive amount of transportation parts would undergone during there production cycle.

Acknowledgements

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References

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 Thomas Pyzdek, Paul Keller, 2000. six-sigma handbook 4th addition.

Background history

during the research, the collective consciences was that lean manufacturing was a great set of principle that will boost more production lines efficiency far beyond what. [1][2]

Striving to achieve the fastest line speed possible may lead to a lot more failures down the line. Quality, failure rates, scrap rates, and down time all effect the effectiveness of a line. All of these have their own measurements for example for failure the most used in industry is six sigma. [3]

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