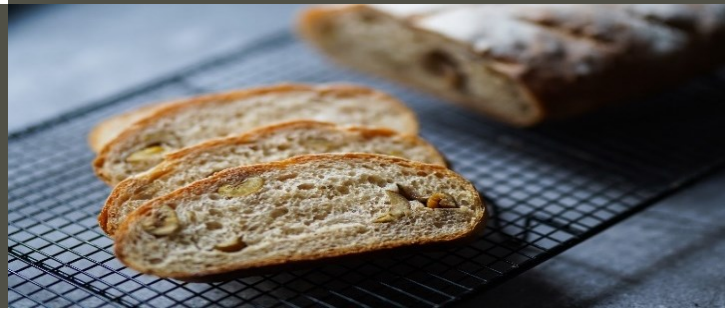




- Process Improvement can not be sustained if the process is not under control.
- Minimizing lead time gives greater capacity, thus offering the opportunity to for mass-customization processes.



### BACKGROUND

The project aimed to help Love-it Bread Inc\*, transformation into a competitive artisan bread manufacturer and set a solid mass customization operation.

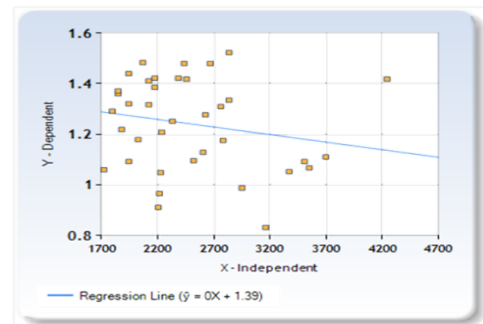
The increase in demand is creating pressure on capacity and labor cost. The right manufacturing approach must be analyzed, proposed, and implemented.

### THE SITUATION

The application of lean manufacturing methodologies benefits firms by reducing their lead times, cutting down production space and increasing throughput while sustaining the quality standards.

The outcomes from the Six sigma approach will provide the bases for a solid application of the lean methods. In combination with Six sigma, the analysis of the eight wastes of Lean manufacturing will support cycle time reduction within the current business process capabilities.

What this analysis shows is that the process is not in control and that the production crew is not optimized (line balanced). During production, the workstations' productivity differs from day to day, affecting the current unit cost.



Data-driven decisions help us see the "big picture" and propose better the solutions. The data analysis showed the weaknesses and constraints of the operation, and this analysis helped to define where to direct the efforts to support a mass-customization project with long-term objectives.

### THE SUCCESS

The business understood that the process had to be optimized before committing to a mass-customization project. After 3 months, the process capability improved, and a Quick Changeover project was proposed and implemented. The objective was to reclaim capacity to accommodate the mass-customization flexibility needs.

Table 2. Process Capability indexes for retail customer specifications

RETAIL	CURRENT SPECS				TOTAL AVERAGE MEASUREMENTS						STANDARD DEVIATION				PROCESS CAPABILITY			
	WIDTH		HEIGHT		BEFORE BAKING		AFTER BAKING		BAKING PROCESS		BEFORE BAKING		AFTER BAKING		BEFORE BAKING		AFTER BAKING	
	LSL	USL	LSL	USL	width	height	width	height	TIME	TEMP	width	height	width	height	width	height	width	height
WHITE SOURDOUGH	165	172	85	105	170	121	168	106	20	249	2.0	4.3	4.0	4.0			0.25	0.08
WHOLE WHEAT SOUR	165	172	85	105	171	67	173	77	19	249	1.2	6.1	3.2	4.0			-0.10	-0.67
BAGUETTE (52-60H)	65	65	80	80	63	40	79	70	17	275	0.4	4.4	3.1	2.5			-1.51	-1.33
DEMI BAGUETTE	65	65	80	80	72	40	88	70	17	275	4.0	5.2	3.7	2.2			-2.07	-1.52
MICHE	190	205	110	113	110	115	210	81	27	249	4.8	8.4	7.3	4.7			-0.23	-2.07
LIGHT RYE	116	124	110	113	119	125	127	83	21	260	5.8	5.7	5.0	4.6			-0.20	-1.96
COUNTRY WHITE	160	170	115	122	166	110	173	88	18	436	3.0	5.0	8.5	4.7			-0.12	-1.91
WHOLE GRAIN HONEY	116	124	115	120	120	77	148	77	20	249	2.9	2.4	7.4	12.0			-1.08	-1.06
FOCACCIA	203	230	38	42	208	45	200	55	21	249	1.9	4.0	4.1	3.6			-0.24	-1.19
BURGER BUDDY 4X4	90	115	25	35	100	20	101	22	18	255	4.2	4.3	3.6	3.8			1.03	-0.26

### THE SOLUTION

The distribution of the dots in the graph shows that the dispersion is not linear; there is little relationship between the production volume and the cycle time.



Production lines were balanced and optimized, improving 14% of the overall production capacity.



The unit cost variance was reduced by 28% giving the business a better visibility of its real markups to evaluate the mass-customization strategy.

\* The company's identity has been disguised for the sake of privacy; however, the case study is genuine.