

Optimisation of a contract manufacturing SME

Student



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Initial Situation: The project was made for Mechanical Partner GmbH, a small contract manufacturing company based in Samstagern, Switzerland. A significant increase in workload has led to a multitude of problems in their business, such as orders being forgotten, miscalculated or delivery dates not met. The Goals of this work are to optimise the situation of Mechanical Partner and to construct a Framework and Guidelines on how to improve SMEs. A detailed analysis of the current circumstances, compilation of all issues, possible solutions and first implementations are elaborated. Furthermore, KPIs and a plan for further optimisations are created. Methods such as Process-Maps, Shadowing, Spaghetti-diagrams, Inventory Analyses and KPIs were performed to find wasteful processes and record the current situation of Mechanical Partner. Furthermore, findings were made simply by observing the shopfloor (Go to Gemba). In total, it was found that approximately 500'000 CHF could be saved. If all this waste could be transformed into value adding activities, 1'000'000 CHF more turnover could be achieved.

Not all wastes could be quantified, especially the findings in "Go to Gemba". The main findings were: Mechanical Partner had no vision and therefore faces problems in decision-making. Furthermore, they are often interrupted in their processes, which makes them more inefficient. They have no measurements in place to track their progress, and their customers are not well diversified.

The main findings are visible in the first picture.

Result: The implementation was split into three parts. In the Guide-Phase the Vision, Mission, Values, and Goals were defined. This gave Mechanical Partner a direction where to steer the company. In the Create-Phase, the first value was created by implementing 5S and Zoning. In total, savings of 115'000 CHF/year could be achieved. Whereby, 100'000 CHF/year came from the 5S (search time reduction, inventory reduction and more robust processes). The distance completed per task was decreased from 188 m to 85 m per task. This decreases the costs and makes the process more stable because areas for Incomings, Outgoings and Quality management were defined. In the third phase, the Establish-Phase, KPIs and Shopfloor Management were integrated. KPIs make the progress measurable and with Shopfloor Management continuous improvement was enabled. By reducing the search time, two additional hours are available per employee each day. One of these surplus hours is used for optimisation and the other for value-adding activities. Therefore, the productive time per employee could be increased from 1.5 hours per day to 2.5 hours. The summary of the results is visible in the second picture.

Conclusion: A Framework and Guidelines on how to optimise SMEs has been derived from the findings of this work and the theory. A Flowchart on how to approach such a project and Success Factors were created (visible in third picture).

Summary of the found wastes

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Process-Map	Shadowing	Spaghetti-Diagram	Inventory-Analysis	KPIs	Go to Gemba
Main Findings: Multiple unnecessary processes, which drive the complexity of the process Waiting, Scrap and Inventory creates a major problem Mechanical Partners understand their processes now	Main Findings: Total Cost of Waste: 382'500 CHF/year Lost Turnover: 800'000 CHF/year Costs of Searching: 180'000 CHF/year Costs of Overview: 45'000 CHF/year Costs of Productive Waste: 157'500 CHF/year 70.5% Waste 17% Incidental 12.5% Value-Add	Main Findings: 31'800 CHF/year Costs due to motion Flow-Principle is not known and could bring many improvements Potential savings: Approximately 50%	Main Findings: Inventory value: 177'000 CHF Yearly costs: 38'000 CHF/year Potential savings: 11'000 CHF/year A lot of unused inventory (tools) Decreasing would save 9'000 CHF/year	Main Findings: Setup Break: 10% of all tasks include Setup Break Costs: 29'000 CHF/year Customer Complaints: 2% of all Task include Customer Complaints Costs: 10'000 CHF/year Missing Material / Tools Costs: 100'000 CHF/year, but the resulting delay is more detrimental and other leads to late delivery. On-Schedule Delivery: 25% Productivity: 12.5% 1% Incidental 70.5% Waste	Main Findings: No Vision: Actions not focused on specific goal Not efficient due to numerous informations No measurements in place: Hard to track progress Offers are mostly unrealistic: Productive time is accurate but a lot of wasteful activities Most revenue comes from a few customers

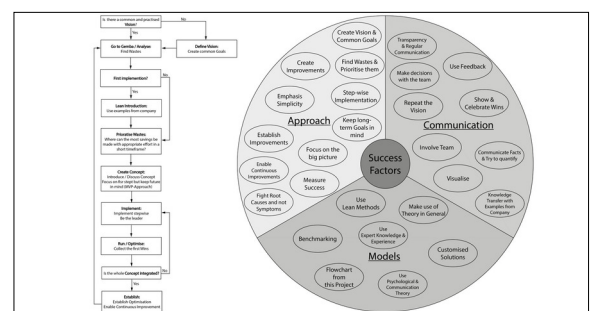
Summary of achieved results

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Vision	5S	Zoning	KPIs	SFM	RFM
Main Findings: Basis for further optimisation and decision making Motivation and Team-Spirit increased rapidly! Key is to define Vision, Mission, Strategy with the whole Team! They now look at decisions and investments in another way	Main Findings: More effort than expected, but optimal for Quick-Win! Achievements: Reduced Searching: 90'000 CHF/year Inventory Reduction: 9'000 CHF/year Reduction of Mistakes: 1'000 CHF/year Total savings: 100'000 CHF/year Implementation Costs: 25'000 CHF Positive Customer-Feedback: More professional Measures pay off after 3 months!	Main Findings: 17'300 CHF/year due to fewer motions! But not just improvements from fewer motions, also process can be made more stable Introduction of Incomings, Outgoings and QM makes process more robust Total savings: 15'000 CHF/year Implementation Costs: 7'500 CHF Measures pay off after 6 months!	Main Findings: KPIs must be well defined. The team must understand them! Compromise between measurability, informative value and comprehensibility Dashboard is a great tool to track the progress, keep the goals in mind and increase the motivation Good basis for SFM	Main Findings: At the beginning a meeting of 20 Minutes a week is to long. After the first week - Meetings twice a week could be implemented Look at KPIs, Discuss general Situation, Define Measures, Prioritize them, set Deadlines and Responsibilities. SFM is the basis for continuous improvement and keeps LEAN-Thinking alive and makes it even stronger!	Main Findings: Approximately 20% of the customers bring 80% of revenue. (Pareto-Rule) 20% of the customers are 5 customers. Cluster-Risk is present but not acute. Segmentation of the customers enables deriving of strategies how to handle customers efficiently

Flowchart and success factors for SME optimisation

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