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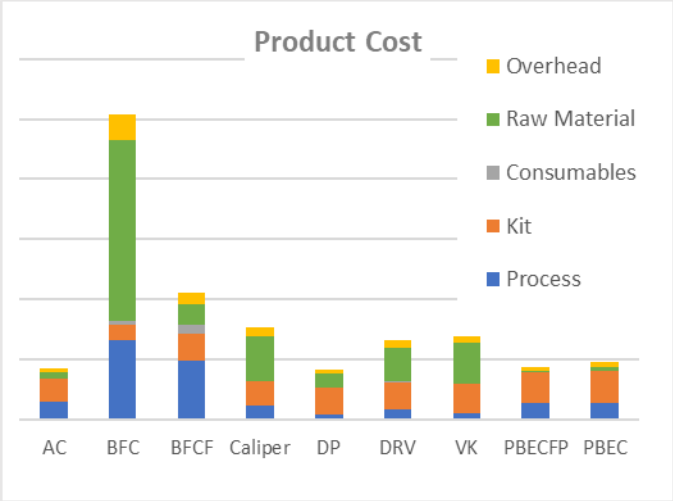
FINDING THE TRUE COST OF PRODUCTION

In todays globalized world with its harsh competition, for a company to stay competitive it is of most importance to keep track of the costs of one's products. But as production becomes more complex, it can be difficult to prioritize in a systematic way and to find the improvements most appropriate to implement. How should this then be done?

When looking at a factory with multiple products and processes, all of which possible to improve and in multiple ways, what should be done? Should a new machine be bought? Should we use another consumable? Should the factory be extended? Or should one product be eliminated? These sorts of questions are hard to analyze and get an overview of. Lean tools have for a long time been considered the go-to philosophy for analyzing and improving production. But many of these tools are not as profound as needed and could in some cases be quite flimsy and unpractical. Perhaps there is a better way? The NEXT STEP philosophy suggests the creation of a clear link between technology and economics and the use of economic indicators as a basis for making decisions. This is suggested to be done using a model for calculating changes in a parts cost, a cost model. The thesis, Cost Based Prioritization of Overhaul Process Improvements is a case study, in which a system for doing this was created - the Cost Model System (CMS).

At Faiveley Transport Nordic in Landskrona the question of how to improve the overhaul process of train brakes had been discussed for quite some time. A thesis project was initiated with the goal to find well-motivated and thought-out suggestions for improvements and in that reducing the cost of the overhaul process. However, if one wants to reduce the cost, one must first determine what the cost is. The way Faiveley have chosen to calculate the cost is to simply put a fixed rate on every process hour, independently of what process. This means that the costs of using a 5-axis CNC machine for an hour or a simple screwdriver for an hour, are perceived as the same. Calculating cost in this manner obviously has its issues and can cause the wrong prioritizations.

The Cost model system CMS was created, using excel and the add-on Power Query to create a data structure and interface that made the process of summarizing the cost and calculating the rate of all processes automatic. Taking in to account losses due to rework, maintenance and repair cost, the cost of the facility, equipment, parts, consumables and much more. The system as such was created to be generic, i.e. able to handle all products and processes at any factory. As the CMS was created alongside with the collection of data, the data structure could be made intuitive in the sense of that data could be inserted in the way it is found, without too much manipulation of it. The output is displayed in charts showing precisely which cost that goes in to the different products. The cost of every process and what those costs account for. It also shows which products are most profitable and which that are most costly. The system being flexible and easily modified, makes it easy to add processes, products, cycle times or try different setups of machinery.



CMS result display, Product Cost chart.

The CMS was used to do a thorough analysis of the current situation at Faiveley. Multiple issues and areas of improvements were discussed, but only a few were further analyzed in the CMS. The sandblasting and its surrounding processes were chosen where three different setups of equipment were analyzed and compared with the current situation. Great cost reductions and process savings could be achieved, especially by implementing a machine which could do both sandblasting and washing. This would eliminate other processes where much material handling was involved. Even though this machine was quite expensive, it was shown using the CMS that substantial cost reductions were possible to achieve, where time savings were more substantial than the cost of the new investment.