Value Stream Mapping as a Basis for Waste Removal in the Agri-Food Industry

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Value Stream Mapping (VSM) is a previously well studied lean tool within the automotive industry, however its applicability in the agri-food industry has not been tested to a large extent. This study has explored the application of VSM at a company operating in the agri-food industry and compared it to the automotive industry. By applying VSM, it was possible to identify waste within the production processes at the company and find suggestions that could reduce it.

The agri-food industry possesses several challenging characteristics that increase its complexity. For example, most of the raw material required for an entire year can only be harvested during a three-month period. This generates complicated planning when it comes to both storage and production. In addition, the agri-food industry struggles with low profit margins and perishable goods.

A case study was conducted at a company, acting in the agri-food industry, producing frozen vegetables and berries. The company has grown a lot over the past years, which has resulted in ad-hoc solutions to satisfy the increasing demand. Therefore, an analysis, such as the VSM completed, was necessary to map out all the different processes at the company. In addition, there was a gap in literature when it comes to the use of VSM in the agri-food industry which is partially filled by this study.

VSM is used to document, analyze, and improve the information- and material flow needed to produce a product or service. It was first developed as a tool for transforming the production according to the lean philosophy, why it is crucial to understand the concept of lean. Lean has the main objective to use a company's resources in the most effective and efficient way. The philosophy considers the use of any resources for any goal other than the creation of value for the customer to be wasteful. Lean and VSM is mainly practiced within the automotive industry and their equipment suppliers.

VSM was found to be a good tool to identify, reduce, and potentially eliminate waste in the agri-food industry. Since the agri-food industry differs from other industries where VSM is commonly applied, so does the use of the tool. It was found that without the presence of other lean tools, the identified sources of waste might require changes or implementations that are more time-consuming and costly. In addition, the lack of documentation at the company did not allow for calculation of the average time that raw material spends in the storage, which is quite essential to get a full and overarching understanding of both lead times and wastes.

The study showed several types of waste affecting the business: waiting, transportation, unnecessary inventory, and defects. Root causes of the identified wastes were found and based on those, several suggestions that could potentially reduce the identified waste were presented, both with respect to information and material flow. For example, the company was suggested to increase their documentation and start using KPIs related to the washing operations. Hence, problems could be easier identified and analyzed. Suggestions regarding the process layout were also made, such as moving the storage location for packaging material to reduce the time spent on driving back and forth to collect it.

Although the study identified some challenges when it comes to the applicability of VSM in the agri-food industry, it is still useful. The tool made it possible to identify many areas where improvements could be made to reduce waste. For future research it would be interesting to see how the application of VSM at an agri-food company with several lean tools already implemented differs from this case.