

# Value Stream Mapping in Warehousing and Distribution Operations

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**Manufacturing operations have in previous years been optimized with Value Stream Mapping without looking at its relation to warehousing and distribution operations. A case study at Tetra Pak in Lund showed that Value Stream Mapping can also be applied in operations outside manufacturing.**

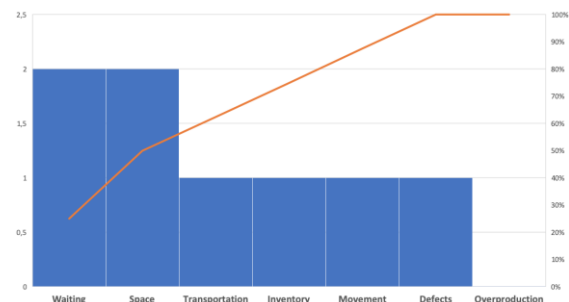
## Limited existing research

The existing literature covering how to apply Value Stream Mapping, a visualization tool from the lean philosophy created to eliminate waste and optimize material processes, in specifically warehousing and distribution operations is limited. A case study that was performed at Tetra Pak in Lund strengthened the perception that Value Stream Mapping is applicable in warehousing and distribution operations. Value Stream Mapping in warehousing and distribution operations identifies how material moves around from the starting point to the ending point in the value stream that is observed. Moreover, Value Stream Mapping provides a snapshot of the actuality in a simple map where waiting time, storage areas and time required at different operations is visualized. When the whole value stream is visualized in a map, waste can be found that may else not be detected. By visualizing the waste and the inefficiencies in the current state, a discussion about improvements is enabled.

## Identified types of waste

Three main areas were identified as inefficient in the case study at Tetra Pak. These areas impact the business at Tetra Pak and each area holds different kinds of waste. The identified types of waste in the case study were unnecessary occupation of space, waiting time, unnecessary movement, misplacement of inventory, unnecessary internal transportation and defects. The two most common types of waste were waiting time and unnecessary occupation of space. The findings from the case study represent an indication of what type of waste that is most likely to be found within

warehousing and distribution operations. The limited literature that exists about this subject state that waste is also common to be found in the form of overproduction in warehousing and distribution operations. However, this form of waste was not found in the case study. But this does not mean that overproduction is not a form of waste in warehousing and distribution operations.



*Summary of the different types of waste and its extent in the case study of Tetra Pak.*

## How to eliminate waste

Different short- and long-term proposals were suggested to Tetra Pak in order to reduce and eliminate the waste found in the case study. A long-term proposal to change the packaging system from corrugated fiberboard boxes to reusable crates could for instance result in a reduced number of damaged products and also less handling time between the different operations. By implementing all proposals suggested, the total lead time could be reduced from 9 days to 6 days and the cycle time of some operations could on top of that be reduced even further. The next step would be to understand the impact in terms of reduced costs for the company but also the potential improved customer satisfaction.

## Further research directions

To generalize the result, further research directions are required, but the findings in the case study could be used to confirm that Value Stream Mapping is applicable and useful for process improvements in warehousing and distribution operations.