Stock Redistribution is No Longer a Problem

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Title of thesis : **Examining and Improving Stock Redistribution Process within European and Asia Regions: A Case Study at Epiroc AB**

In recent years, the trend of stock redistribution between some stock locations is increasing to immediately fulfil customer demand. There is also a need in the manufacturing industry to reduce the obsolescence and scrapping costs of unhealthy inventories. Moreover, the redistribution of unhealthy inventory can satisfy the demand on another stock location and generate a cash flow to the company. Therefore, the need to manage the stock redistribution is becoming important for the company's flexibility.

Epiroc AB, a Swedish-leading manufacturer for mining and infrastructure equipment, urgently needs to solve this issue to reduce unhealthy inventories in some stock locations in several countries. Currently, there is no visibility to the profit margin and cost for every process involved in the redistribution of product from one country to another country. The stock redistribution process involves transportation, export-import, and taxes complexities in the global supply chain environment.

This thesis project aims to provide both optimal and approximate solutions for the company. We created a decision model in Microsoft Excel for the company to provide the most profitable redistribution network for the company. The user in the company can set the specific lead time based on the customer requirement. We also developed a logistics clustering matrix to provide an approximate solution when the company finds difficulties to collect the transportation cost between each paired country. The lead-time and trade relationship on each axis can represent the distance, transportation cost and import duty in an approximation way. The most interesting part is the usage of a colour-based rule matrix to decide which country's stock location should be approached.

Surprisingly, the sea freight mode is not only the most cost-efficient transportation mode, but also the most sustainable transportation solution to the environment. Then, it is followed by road freight mode as the next cost-efficient and sustainable transportation mode. Therefore, the company can achieve the triple bottom line rule (People, Profit, and Planet) at the same time using the optimal and approximate solutions.

Instead of only focusing on reactive redistribution when one stock location faces a stockout problem, Epiroc should encourage the proactive method. The Regional Distribution Center should be able to manage the redistribution before the demand is known.

All solutions are very easy to implement and use the most convenient software (Microsoft Excel). There is no need for high-level management in the supply chain to have a regular weekly meeting only to review and provide discretion for each redistribution case. The decision can be made using the scientific solution by the lower level of each supply chain organisation in the company's subsidiaries to replace the current best-guess method.