

Configuring a Distribution Centre within the Wholesale Food Industry - A Complex Task

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It might seem straightforward to configure a distribution centre but, in fact, it demands resilience and ingenuity. In an environment with stringent customer demands, thousands of products, and a constant flow of unique orders, there is little room for standardisation.

When configuring a distribution centre, there are almost countless decisions to be made. These decisions include everything from how the goods should be stored and how customer orders should be picked and sorted, to the type of racking and forklifts that are most suitable to use. However, with all of these decisions and the many alternatives and possibilities for each one, the task of configuring a distribution centre might feel overwhelming. What is the best way to approach the task? How do you know what configuration is most suitable for *your* distribution centre?

To answer these questions, literature suggests that the distribution centre's surrounding environment should be considered. Adapting a configuration to suit specific circumstances can enhance overall performance, while failing to do so may lead to reduced performance. So, from this we understand that every distribution centre operates in a unique environment, meaning that each configuration should therefore also be unique.

By looking into a company in the wholesale food industry and gaining a deeper understanding of its distribution centre and the particular circumstances, the main environmental factors were identified. These factors, highlighted as the most important to consider, include the demand profile, the product

assortment, product characteristics, and order characteristics. With support from existing literature, it was possible to understand the suitability of different configurations and address the complexities to make it possible to develop a suitable configuration.

Let's take a closer look at the decisions regarding how goods are stored within the distribution centre for the company in the wholesale food industry. Since the company in question handles dry, refrigerated, and frozen products, a natural consequence is that these products are stored separately. When looking into each temperature zone, it was evident that even when stored in the same temperature, this was often the only similarity between products. Considering this and the large variations in how often different products were picked, class based storage was deemed the most suitable option. Class based storage means that products that are more frequently picked are allocated to more convenient storage locations.

To develop a configuration based on an analysis of a specific environment for a specific company is surely of great use for the company in question, while a more generalizable contribution might seem limited. However, the conducted analysis and the tools used can be generalised to fit any warehouse configuration and hopefully provide insights to what configuration is most suitable in any environment.

This popular scientific article is derived from the master thesis: *Warehouse Configuration with Contextual Considerations in a Distribution Centre for Perishable Goods: A design science study of a Swedish distributor in the wholesale sector*, written by Michaela Alsterberg and Emma Holmqvist (2024). Division of Engineering Logistics, Lund University.