

Taking advantage of the network size

Model for determining spare part safety stock levels considering lateral transshipments between production units

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Maintenance is not always predictable. Unexpected breakdowns in machines can happen and when they do, spare parts are needed. In many of these cases, ordering the spare part from the supplier takes too much time. Safety stock is used to hedge against this. In large networks, it is not uncommon that the same spare part is used at a factory that is nearby which means that the spare part can be purchased from there instead. The question is: how do you consider that when setting the safety stock level and how do you measure the performance of the spare parts flow?

Procurement of spare parts represents a significant part of the total indirect cost at IKEA Industry. Many spare parts are common for several of the production units, but safety stock is defined locally without considering common stock or stock in other units. One of the challenges facing the business today is to optimize the availability of spare parts, while minimizing the cost for handling and storing.

The purpose of this study is: (1) to develop a model for determining safety stock levels for spare parts at production plants at IKEA industry, taking into account the availability of components in nearby production plants rather than viewing them in isolation and (2) identifying performance measurement indicators for the spare parts flow.

In order to fulfill this purpose, a research method combining both quantitative and qualitative data is used. Information was gathered from literature, interviews with staff at IKEA Industry and raw data from internal systems and documents at IKEA Industry.

A model consisting of three parts is used for finding optimal safety stock levels. The first part determines what the sum of the safety stock in all of the affected production units should be.

The second part allocates the safety stock based on the breakdown rates in the production units. The third part calculates the probability of shipping items between factories and calculates the total cost considering cost of storing items, not having items in stock and shipping items between factories. Finally, the model chooses the allocation of safety stock with the lowest total cost. The model does not suggest any significant decreases in stock levels. It is cheaper to keep extra units in stock rather than risk having shortages and transshipments due to imbalance between the cost parameters. The selected set of spare part articles is not representative enough for these findings to be applied to all spare parts at IKEA Industry. There is also some uncertainty in the input variables that need to be addressed. The shortage cost in particular, needs to be revised when better information is available at IKEA Industry.

A spare parts performance measurement framework is presented which categorizes spare parts based on their demand, material price and availability risk. Using a chosen KPI, in this case the service level, underperforming spare part categories can be identified. With this, management can focus their efforts better. Performance measurement can be improved as well by implementing the suggested framework.

The overall conclusion is that IKEA needs to work more with identifying financial data and making spare part information stored in the internal systems more readily available and accurate before any sophisticated spare part inventory models can give a representative result. The same efforts are needed for a more extensive framework for spare part performance measurement.

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