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IKEA - Increased transport efficiency
by product and packaging redesign



THE PLATFORM

If transport continues to grow at the same rate as the economy, this will become both an economic and an environmental problem. Increasingly congested roads are as much a disadvantage to European business as they are to society at large. The bestlog project, initiated by the European Commission, will establish an exchangeplatform for the improvement of supply chain management practice across Europe.

OBJECTIVES

- To improve logistics practice and logistics education
- To raise the overall standards of practice across Europe
- To set high standards for logistics education and practice
- To create economic growth and job opportunities as a result
- Achieve a better match between EC policy and business decisions

SOLUTIONS & ACTIVITIES

- European platform for sharing logistics best practice
- Online directory of logistics best practice case studies
- Online directory of European logistics education opportunities
- Benchmarking on line for European companies
- European conferences to share logistics best practice
- Web forum, award directory, media directory, and more
- Industry workshops





IKEA - Increased transport efficiency by product and packaging redesign

PROBLEM DESCRIPTION

Many of IKEA's products are low value but high volume products. Transportation costs form a large part of the total cost of many of the products, which makes it important for the company to minimize transportation, handling and warehouse costs wherever possible.

A problem IKEA has identified is that many of their low value products use excessive space on load units due to packaging design. This packaging design results in poor efficiency in both the transportation and warehouse operations, and thereby creates unnecessary costs. Examples of large products are pillows, mattresses, sofas, and others which are filled with air and therefore take up a lot of unnecessary space during transportation and storage. Another example of a product that has traditionally included a lot of air in its packaging is the Glimma tea candle. The original packaging for the candles is a bag containing 100 candles weighing in total 1.4kg.

IKEA has been looking into ways of eliminating as much air as possible from their product packages. By doing this the utilization of transport load units and vehicles would be increased, and thus lead to higher efficiency and lower transportation, handling and warehouse operations costs.

The excessive packaging space used during transportation affects the environment as well, as too many vehicles are being used for transportation operation.

Solving the problems affects packaging design and even in some cases product design, as it has to be adapted to the new packaging design. IKEA's suppliers need to be involved in decisions on packaging design, as the manufacturing processes are often affected.



In order to lower logistics costs and increase efficiency in its transportation and warehousing operations, IKEA started an internal competition to reduce unnecessary air in their product packaging. This "Air hunting competition" focused on removing as much air as possible from packaging and thereby increasing true product volume during transportation and storage. Several IKEA products were identified for packaging development, one being the Glimma tea candle that is described in this best practice documentation. The development of the Glimma tea candle packaging resulted in a 30% increase in products volume for each load unit. Thanks to this packaging development, the efficiency of the transportation and warehouse operations is now much greater and the impact on the environment has decreased significantly.

COMPANY FACTS

Company name: IKEA
Location: Sweden
Industry/sector: Retail
Company size: Large
Employees: 118,000
Turnover: 19,000 mio. € (2007)

Services/products offered:
 Furniture

Further case related logistics figures:

- 522 million customers visited an IKEA store in 2007
- Suppliers are about 1350 in 50 countries.



THE SOLUTION

The Glimma tea candles' original packaging was a plastic bag randomly filled with 100 candles. The round shape of the candles and the nature of the packaging process resulted in a bag containing a substantial portion of air. To solve this problem, the air has to be taken out of the bag and the number of candles per unit increased. The solution is to place the candles in such a pattern that the density of the product package is increased, removing excess air. Both of these solutions depend largely on the product's shape and the potential to improve the package design.

By using a new packaging method it is possible to decrease the amount of air enclosed in the Glimma packaging process. Instead of using the previous method of randomly filling a plastic bag with 100 Glimma tea candles, they are now neatly stacked in five rows, 4 x 5 candles in each layer. The result was that more candles could be loaded on each pallet, rising from around 250 to 360 packs, resulting in a near 30% increase of products per load unit.

Increasing the density of the packaging led to an increase in weight per pallet. Previously about 60,000 pallets in total were shipped worldwide every year. By increasing the load capacity by 30%, the total amount of pallets could be reduced to 42,000 pallets worldwide. This results in a significant decrease in transportation work and costs.

However, the weight of the load unit increases to such a level that the weight can exceed the load capacity of vehicles if they loaded to reach full volume utilization. The weight of a 40 ft container with full load would be approximately 22,000 kg, which exceeds the maximum weight allowed for a vehicle, semi-trailer and load in some European countries.

The solution to this overload is to balance the load on the trucks by using lightweight products to fill up the left over space. This was accomplished with voluminous but lightweight products such as mattresses and folded sofas. This load balancing results in high utilization, in respect of to both weight and volume.

To be able to achieve this type of balancing, products need to be consolidated from different suppliers and travel together to a common destination. IKEA has solved this by using a



so-called "cluster supplier". The "cluster supplier" concept is based on a solution where a major supplier of IKEA takes responsibility for storing goods from the other suppliers for later consolidation with its own goods when orders are despatched to central distribution centres and warehouses in different countries. For the Glimma product, the candles are sent to a cluster supplier which in some cases is also a supplier of mattresses.

The cluster supplier concept typically involves several smaller suppliers, from seven up to 24, in the area around the cluster supplier, who deliver their products direct to the cluster supplier. When orders are placed all the shipments are consolidated and sent to the ultimate destination. There are four suppliers of the Glimma tea candle worldwide, located in Europe as well as in Asia.

STRATEGIC IMPLEMENTATION

It was very important for IKEA to work closely with the suppliers, as in many instances the packaging processes needed to be changed. In some instances considerable investments needed to be made and as the total cost of the products was not to be increased, the costs needed to be absorbed through increased process efficiency.

Another important aspect of the implementation was to fit the Glimma distribution to the IKEA "cluster supplier" concept. The candles need to be transported to a cluster supplier that can then consolidate the relatively heavy candles with lighter products such as pillows, mattresses and the like. It was critical to the success of the project to achieve this, or the benefit of reducing the air content in the product packaging could not be fully realized. This is due to being unable to fill the transportation units fully due to weight constraints. By integrating flows from several suppliers, it is possible to consolidate goods of different density to balance the transportation weight and volume ratio.



CHALLENGES

Challenge 1: Finding ways to reduce unnecessary space in packaging without having to alter the product design too much.

Challenge 2: Load balancing products of different volumes and weights to fill transportation units, in regard to both weight and volume.

Challenge 3: Motivating suppliers to take part in the development as in some instances the production processes have proved more expensive.

Challenge 4: Stick to the original price of products, although investments needed to be made in new packaging technology.

Challenge 5: Develop a packaging method to ensure as little air remains in the package as possible.

Challenge 6: Integration of various suppliers in an area within a "cluster supplier" scenario, as the innovation involves storage of one company's products by another supplier.



"The Glimma packaging redesign is a typical case that shows how simple packaging changes can make a huge impact on transportation volumes and thereby costs, as well as environmental impacts."

Mr. Stefan Nilsson, Need Planner IKEA

In IKEA warehouses, the customer picks up the items they wish to purchase from the shelves themselves. The item packaging is important for the space and replenishment operations.



LESSONS LEARNED AND SUCCESS FACTORS

- The solution is itself not innovative, but it shows how greatly small changes can affect the utilization of transportation and warehouse resources. At times, small but continuous improvements will yield better overall improvements and cost benefits than a small number of large projects that are more likely to fail to achieve their goals. Over time this type of thinking could be applied to other products as well, to lower costs and increase both economical and environmental efficiency, mainly in transportation operations.
- It is important to find new ways of integrating the various suppliers in the supply chain to be able to improve efficiency and lower costs. Not every company would be able to integrate suppliers in this manner, but companies of IKEA's size are more likely to be able to negotiate agreements with their suppliers such as the cluster solution.
- Small and relatively simple changes to something such as product packaging can lead to great improvements in efficiency and cost efficiency. However, even though it is a relatively small change in a product's packaging, it can still lead to investments in new packaging equipment to be able to fulfill the project requirements. In that case it is important to consider whether the benefits of the investments are indeed greater than the costs.
- It is of the utmost importance to involve suppliers in the development at an early stage, preferably with people who have hands-on experience of the product and can contribute good ideas in line with the project goal. In most cases contributions from the business partners involved are more likely to be successful than directives coming from the customer.
- Unforeseen side-effects are not uncommon and in the Glimma case, the packaging technology led to much more convenient "shop ready" packaging. The design means much less time is spent in preparing the product for display in the retail warehouses.

SUSTAINABILITY

THE BENEFITS

The major benefit is much more product in each load unit, meaning better utilization of transport units and storage space. In addition, handling becomes much easier as fewer units are being handled, both at supplier sites, central distribution centres and in warehouses. Thanks to increased efficiency in transportation and handling, the impact on the supply chain and the environment is decreased

Economic

- Utilization of transportation resources increased by 30% for both IKEA and its business partners
- More space in warehouses that can be used for other purposes, such as storage or display of other products
- The new packaging makes it easier for the customer to handle the product in the store
- Easier to replenish the warehouse as the product is more or less "shop ready"

Environmental

- Less noise and emissions due to approximately 400 fewer 40-ft containers on the roads
- Reduced need for warehouse space
- Smaller packaging leads to use of less packaging materials (corrugated paper and plastic film)

Social

- 400 fewer trucks less on the roads reduces the risk of accidents (no precise figure is available)
- Less transportation, however, affects employment within the transportation industry

TRANSFERABILITY

Country **++**

Sector **++**

Company Size **++**

Transferables

Eliminating empty space (air) from packaging means that the unit volume is decreased, and this can be achieved for most products in most industries, independent of geographic location and company size.

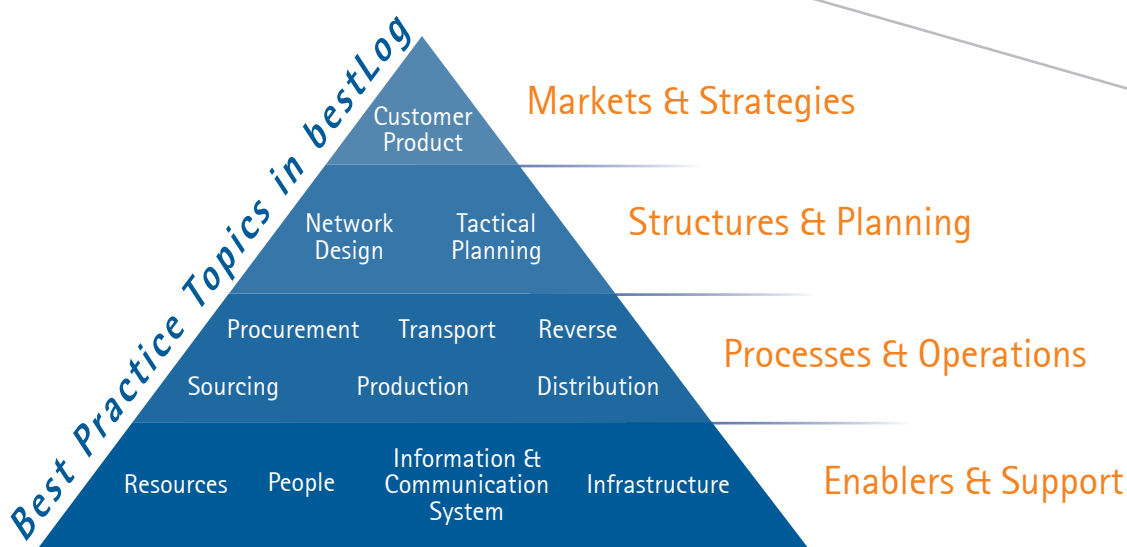
Limitations

Investments are needed in production modifications.

Contact



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