

# **Packaging logistics and retailers' profitability: an IKEA case study**

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## **Abstract**

Many businesses still put too much focus on manufacturing, marketing and sales without considering the inter-linkages amongst these elements. This paper shows the importance of including packaging logistics and supply chain management in strategic planning. By integrating these aspects, retailers and suppliers may reduce costs, environmental impact and increase profits. A case study at IKEA is used in the paper to demonstrate the issues. The importance of cooperation across the supply chain is identified as a key factor. Another conclusion is that even minor changes may result in big benefits since the scale of operation is so large.

## **Introduction**

It is quite natural, even in today's business environment, to believe that it is only retailing and manufacturing that matter in a successful business plan. The emphasis is often on whether the product can be produced and then sold. How the product actually makes the journey from producer to consumer is of increasing concern, though attention still lags behind producing and selling. This goes hand in hand with a belief that what goes on 'behind the scenes' does not really matter to the success of a business – and certainly does not justify major business resource or thought from the top of the company.

Many believe that it is quite sufficient to let logistics proceed at a lower level of management attention, or better still, simply outsource the activity to a third party or business partner with no further management time spent on its control or development. Such views are misguided in that the logistics and supply functions represent real opportunities to enhance business and supply chain performance. The problems of supplying often volatile consumer demands are substantial, and the costs of getting it wrong can be considerable, both in the short and the long term.

The purpose of this paper is to highlight the need for retailers to increase their top management attention on supply chain performance. When top managers focus on applying packaging logistics experience and knowledge the result is higher profit margins and lower costs as well as reduced environmental impact from transport.

This paper aims to explore how small changes in products may influence production, packaging and distribution and in the end provide great benefits to the business. In particular it illustrates the need to understand product and packaging development as well as understanding production and supply chain properties. To meet this aim, the paper is

structured into four sections. First, we provide an introduction to the topic of packaging logistics and retailing supply chains. Secondly, a brief methodological section is provided. Thirdly, the case and the consequences are presented. Finally, lessons are drawn.

### **Packaging logistics in interaction with product and packaging development**

First, a brief introduction to packaging logistics. There is an initial distinction to be drawn amongst primary, secondary and tertiary packaging. Primary packages hold the basic product and are brought home from the shop by the end consumer. Secondary packages, or transport packages, are designed to contain several primary packages. A secondary package could be taken home by the end consumer or be used by retailers as an aid when loading shelves in the store. The third level of packaging, tertiary packages, comes into use when a number of primary or secondary packages are assembled as for example on a pallet. The Figure 1 considers the package life cycle as a whole.

As might be anticipated from Figure 1, there are different purposes and functions of packaging depending on the type and role of the packaging involved and its place in the distribution channel. Figure 2 attempts to provide a guide to the most important functions of packaging at different levels. The main levels of protection, performance and information are subdivided into further functions. Figure 2 also summarises the drivers influencing packaging and the benefits deriving from packaging. It is clear that many elements of the performance component and of the benefits have a direct impact on logistics and supply chains.

Packaging is often developed *after* the design of the product (Jönson 1999) and according to Hine (1995) separately from other design activities even if the packaging literature stresses that product and packaging are two integrated items that would benefit from joint development (Esse, 1989; Paine 1991; Kooijman, 1995; ten Klooster, 2002). Bramklev (2003) has shown that the integration of product and packaging is preferred in many cases. It is a recognized need to integrate packaging considerations into the product development process (e.g. Bjärnemo et al. 2000; Johnsson 1998; Paine 1981; Shina 1991) in order to improve the logistics activity, the performance of the product and the packaging.

But this is still an area in its infancy and very little research has been conducted (Johnsson 1998; Saghir 2002). Today the product is complemented with packaging, i.e. another product, to fulfil the demands of the later phases in the product life cycle. Klevås (2004) has in her work shown the close connection between the product, the packaging and the logistics activity. In a case study at IKEA she has shown that the integration of packaging in *both* the product development team *and* in the logistics function is more successful because of the input of a supply chain overview (Klevås, 2004).

Within one of the largest retailing sectors – food retailing – large actors have already understood the need for change and the need for new packaging systems to meet demands throughout the supply chain. E.g. Tesco's retail transformation demanded a concurrent logistics transformation (Sparks 1986; Smith and Sparks 1993, 2004; Smith 1998). For such retailers, much of their product flows are transformed from being based on stock holding to rapid movement and no stocks. Such strategic changes put new demands on the efficiency and effectiveness of packaging concepts.

In such transformations, certain system properties are brought into focus, e.g. handling costs both in the distribution centres and on the retail shop floor. There is a growing awareness

among companies that efforts can be taken to enhance both efficiency and effectiveness by applying a broader sense of thinking, from a packaging logistics perspective.

In addition to the demands arising from the product characteristics, packaging has other logistics dimensions. In all supply systems there are issues of unitisation, inter-stackability and other requirements to achieve best possible transport economy. Better packaging logistics will also minimise handling costs and provide more secure loads, with less damage to the product. Packaging also has to consider the environment. Existing packaging solutions can create added transport requirements and unnecessary packaging waste.

Packaging logistics takes a supply chain approach to the development of packaging, seeking efficiency and effectiveness across supply chains by the co-ordinated development of packaging activities and solutions. However, identifying changes that need to be made in supply chains to make them more efficient is one thing. Actually carrying through and implementing such changes is more problematic, with many opportunities for delays or errors.

## **Methodology**

The implementation of system-wide changes is often difficult, especially where actors with different interests are involved in the supply chain. It is of interest to illustrate the potential benefits when such changes are actually put in place along the whole supply chain. We have therefore selected a case study where the main player controls the whole supply chain so as to demonstrate the beneficial results when full cooperation within the supply chain is attained.

According to Eisenhardt (1989) the *case study* is a research strategy focusing on understanding the dynamics present within a single setting. Both Yin (2003) and Eisenhardt (1989) remark that the case study is a strategy that typically combines data collection methods such as archives, interviews, questionnaires, and observations. The evidence may be qualitative, quantitative or both. It may be used for many purposes, but one of them is the building of theory, which in turn might be utilised for building a general product development procedure model (Eisenhardt, 1989).

Since IKEA is a retailer which is capable of grasping the total supply chain, with full control from raw material sourcing to the end-consumer, a case from that company has been chosen to illustrate the implications and the complexity of packaging logistics transformation projects. This case study is based on personal interviews with key people involved in the project, combined with observations at certain locations across the supply chain.

### **IKEA: the tea candle case**

IKEA was founded in 1943. It has been recognized as one of the world's best retailers in terms of sales volume, growth, number of stores and number of countries (Arnold 2002). The company has also been recognized as viewing packaging and logistics as important factors for success (Bowersox et al. 2002; Johnsson 1998).

At IKEA stores the customers select their products directly from the stock that is displayed in the store or immediately receive it from the store warehouse and take it home, where they carry out the final assembly operation. IKEA has total control over the supply chain from the supplier to the end-customer. IKEA does most of the product development in-house, but does not own the manufacturing facilities. Today, there are more than 200 IKEA stores in 31 countries and the range of products is almost the same in every country. The main market is

Europe (82 %), followed by North America (15 %) and Asia (3 %). In the beginning IKEA primarily worked with furniture, but now the availability of accessories and ancillary products are just as important. This broadened product range has resulted in a number of different packaging solutions, where IKEA had to leave their original “flat package, home assembly” concept. The case described here is a widely appreciated product, with such a large volume of sales, so even minor changes in the packaging will result in considerable influence on product profitability.

The amount of manually loaded goods has increased as IKEA has entered the global market. Distribution and the packaging solution have from the beginning been set for the European distribution on Euro pallets. This has become a limiting factor as the market has become more global. Unloading times and product damages have increased and the capacity fill rate for the containers became unsatisfactory. So during 1996 and 1997, IKEA decided that the packaging issues had to be addressed. A packaging support function was set up in 1999, called the Packaging Concept. (Klevås 2004). The idea was that the packaging technicians should be located closer to the products and the product development process. This meant that new systems were developed to fulfil IKEA’s different needs.

Klevås (2004) has described the present organisation the following way

Packaging Concept’s main task is to create the overall packaging concept at IKEA. Packaging Concept is a part of the Distribution Service competence function, where logistical tasks at a strategic level are performed. The reason for putting Packaging Concept into the Distribution Service was for it to be close to the supply chain perspective, from the packaging line at the supplier to the end-customers in the stores.

There has been a continuous search in IKEA to reduce the amount of empty space in packaging and vehicles. In 2002 it was found that GLIMMA (the IKEA product name containing a package with tea candles) had more air than any other package. As the GLIMMA product was a massive sale success, it was obvious that a change in packaging would be very beneficial.

The original consumer package held 100 candles in a plastic bag. The bags were packed in large cardboard containers placed on full-size pallets (1200x800 mm), offering a display function, see Figure 3. (Photo of old product packaging concept). The plastic bag was difficult to handle and expose. The floor space utilisation and display functions were not good.

In November 2002 a project was initiated, where two members of staff members were selected and given the mission to investigate the potential for improvement in the product, packaging and distribution. The staff chosen had received internal IKEA education and reported directly to the managing director of the IKEA packaging department. This director has an MSc in mechanical engineering and logistics, working with universities to develop the packaging aspects. They formed a team together with the product development people and the suppliers of the candles. The objective was to make the space wasting bags more effective in all parts of the supply chain from supplier to store.

In February 2003 they had identified a solution for the total supply chain which was expected to fulfil all the technical properties of the tea candles. In July 2003, four pallets of the prototype solution arrived from the supplier in China.

Since the management responsible for this product range accepted the prototype solution, a next step was taken in August 2003, when IKEA started to work together with a German company that develops and produces machines for the candle industry. Test tools both for the tea candle and for the candle cup were manufactured during the autumn. The old consumer package did not need any sophisticated packaging machinery, but the new solution required new machinery to sort the candle as seen in Figure 4. Another machine, which would pack the tea candles, was discussed during the autumn. In the beginning of 2004, the production of that machine was started. The re-designed product and package was tested in April and accepted. In August 2004, the first 100-pack was delivered from the new machine. In September, production could start at full capacity. The new packaging solution can be seen in Figure 4 and Figure 5.

A European pallet in the new German system holds today 360 packs, each holding 100 tea candles, instead of the original 252 packs of 100 candles on the pallet. That reduced the number of Euro-pallets used from 59,524 to 41,667 pallets. This reduction lowered the number of trucks needed for the distribution from warehouse to store by 200 trucks each year. It resulted also in lower costs and less environmental impact. It actually produced 21 % less CO<sub>2</sub> emissions from fossil fuel used in the vehicle journeys each year. The new packaging solution also required less packaging materials in bags and cardboard boxes. These savings meant that it was possible to increase the profit margin, as the price for 100 tea candles is the same as before.

Time has also been saved in the store. The new production and packaging solution result in easier handling, faster unpacking and better display opportunities. As one pallet takes five minutes to unpack in the store, IKEA calculates with a saving of 186 working days each year in the stores. See figures 6 and 7.

The new solution also promotes the commercial requirements better than before, as less cardboard is visible and less floor space is required per 100-pack. This results in more available space for other products to be displayed and sold in the stores.

One detail concerning the product design is also worth mentioning. When sorting and packing the tea candles in the new concept, there was a risk of damage to the candle wicks. Misplaced wicks could also influence the packing line efficiency. The wicks were shortened in order to reduce the risk for this occurrence. For this reason the candle casting tools had to be adjusted to allow a hollow profile around the wick. The change can be seen in Figure 4. The wick was shortened by 2 mm. The burn time of the candle was, however, not changed. This change made it possible to reduce also the transport needed to get the wicks to the production line each year by the equivalent of a round trip from Stockholm to Madrid.

## **Discussion and conclusions**

There are challenges that arise from an increased global reach. This case demonstrates the effectiveness of the retail power to influence the whole supply chain with an improved channel method of operating. The attention to detail laid the foundations for an agreement of a revised packaging design with all the supply chain parties from the manufacturer to the store. The improvement in transport space utilisation provided not only a lower cost but also a benefit to the environment by less journeys made with a reduction in carbon dioxide and other emissions.

These points reinforce some of the central propositions that the author team consider critical to successful packaging design. The perspective taken is an end-to-end assessment for all the parties along the whole length of the supply chain. There is benefit in having the review team report to a senior director and in positioning that team within distribution, a part of the supply chain than can otherwise be ignored. There is a considerable advantage to be achieved in working to gain retail, manufacturing as well as supply chain benefits in order to obtain the approval for the costs of implementing the necessary changes at the manufacturer.

This case shows the importance of forming a task force team to take action after having been provided with a clear mission and management support. Kanter (1984) points out that all change processes are based on three basic requirements: first the availability of facts and information, second that enough resources are provided for the change project and third, the management support, not only in terms of economic resources but also a commitment to the vision and the objectives of the project. In addition to this, the authors would include a fourth basic requirement. Before succeeding in getting support for new solutions, much effort must be put on *gaining acceptance* for the new visions and ideas (from both top management *and* the grass-root level) and across the supply chain.

This immediately raises issues of power in the supply chains as ideas about acceptance are inevitably bound up in questions of power. Who has the power in the supply chain? Is it one single dominant company (as IKEA in the case described here) or an alliance of companies within the supply chain? This aspect is important to take into consideration when performing an analysis concerning the preconditions before starting a change process within a supply chain. From the authors' experience it is our conviction that it is often about seeking ways of communication with all parts of the supply chain, in order to create a meeting of minds where good operational ideas can be exchanged and then used in the creation of a full list of requirements for any new packaging logistics system.

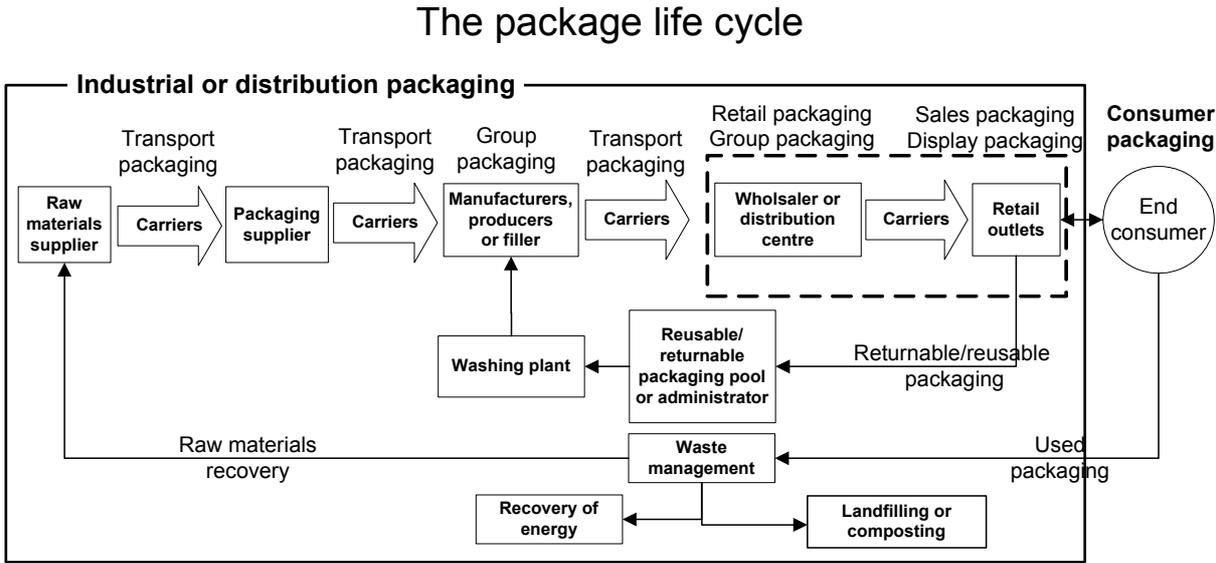
For too many, for too long, logistics and supply chain management have been an afterthought. It is time for all retailers to reconsider their supply chain concepts and investigate the potentials of improvement in terms of profitability, customer service and resource management. It must be noted that even minor changes may result in big benefits since the scale of operation is so large. In the IKEA case, this is illustrated in the candle wick protection issue.

More research is needed in order to identify and describe the opportunities and obstacles within supply chain and packaging logistics change processes. The potentials are obvious which would be a strong signal to top managers within retailing to start looking at what is really going on behind the scenes.

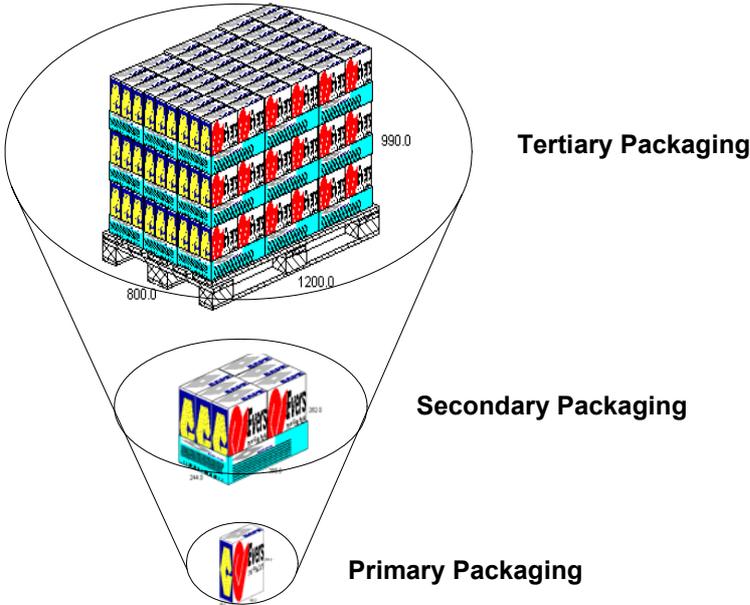
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**Figure 1: Different packaging terms used and the levels of the packaging system.**

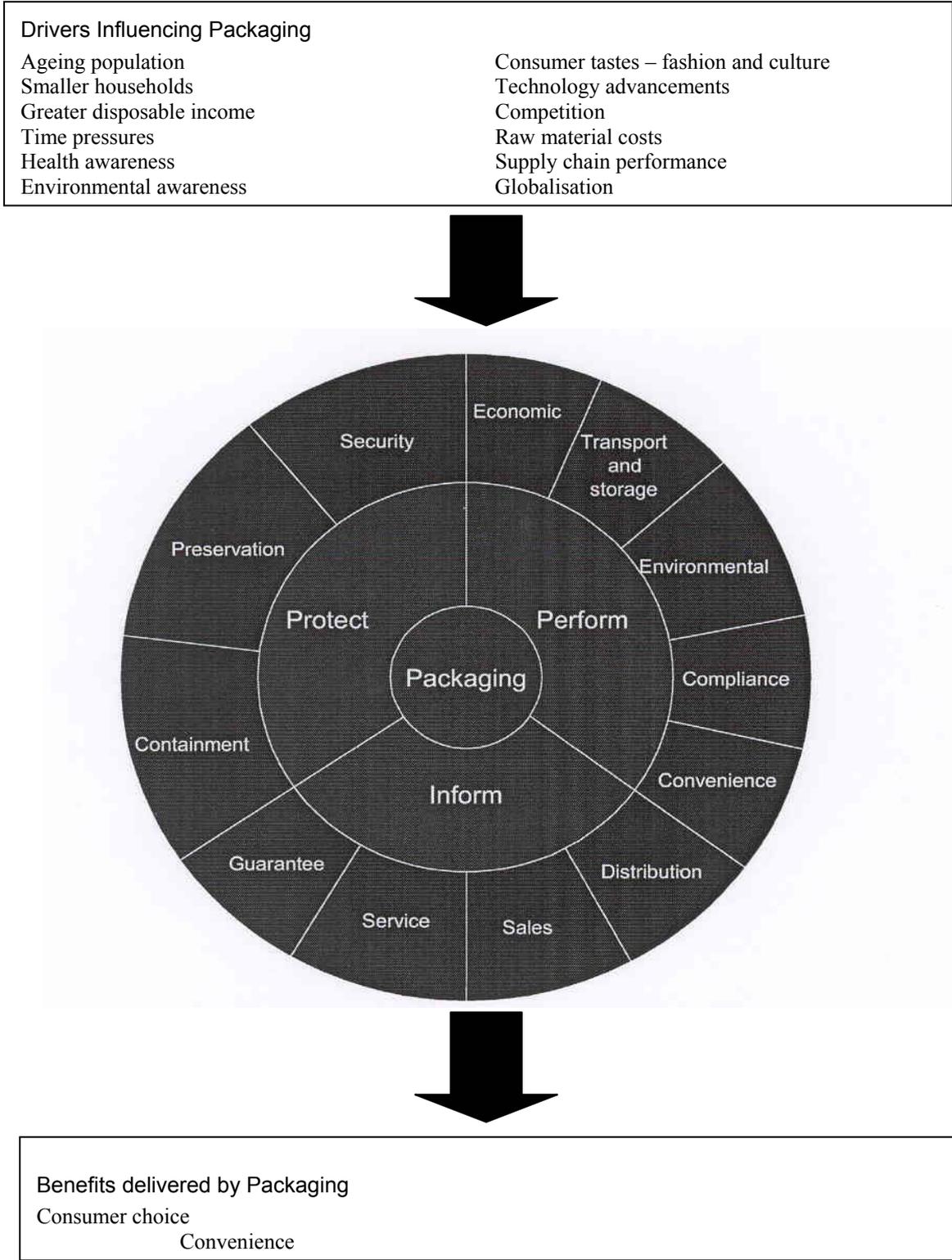


### The levels of the packaging system



Source: (Saghir 2004)

**Figure 2: The Purposes of Packaging**



Source: Pira/University of Brighton (2004)



**Figure 3: Photo of old product packaging and display concept**



**Figure 4: New packaging solution to the left, old plastic bag to the right. NB the new hollow profile on the candles, designed to protect the candlewick during handling and transport.**



**Figure 5: The old packaging solution on pallet**



**Figure 6: New packaging solution on shop floor, requiring less floor space.**



**Figure 7: The new packaging solution on pallet**