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### How cost can be reduced by packaging design

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#### ABSTRACT

In this study, identification of value on the basis of packaging design for products of Olmuksa International Paper Sabanci is explained. First, packaging and related concepts are introduced, then how a corrugated packaging manufacturer conceptualizes cost reduction is also explored. Finally, corrugated cardboard package design examples parallel to this conceptualization are provided. The authors conclude that cost reductions may be realized for companies that both produce and consume packaging.

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#### Introduction

The Industrial Revolution brought about an increase in transportation opportunities and higher sales volumes for various products within a short period of time. Consequently, time devoted to preparing goods for distribution was shortened, and lifting, filling, and labeling machines became essential to the process. Transportation of products across long distances (even across continents) and for extended lengths of time required that goods be preserved safely [1]. Packaging facilitates rolling things in paper, wood, or plastic material; it is a technology or an art of carrying, stocking, or preparing goods for sales [2]. Packaging protects its raw or processed product content and ensures unharmed and efficient treatment of the content while it passes through the supply chain before it is ultimately delivered to the customer or consumer. The package itself must be produced from material that is suitable for the product [3]. Packaging is divided into three categories; sales, outer, and transportation packaging [4, 5, 6]. Since any mass-produced product reaches its consumer in some type of packaging, it is understood that the main function of a package is to protect its content product. In addition, packaging design is a form of communication by which a retailer conveys to the consumer a message about the product [7]. Goals of packaging include protecting the product from physical damages and contamination, attracting sales, integrating the brand into the marketplace, informing about content, minimizing distribution and stocking costs, providing ease of use for the consumer, and ensuring tamper-proof and safe transportation [8].

Corrugated cardboard consist of three layers of paper. The two side faces of a corrugated are called liners, and the inner board is known as the ondule [9]. Cardboard protects, holds, and helps the sale of the product. Corrugated cardboard boxes used in outer packaging are appropriate for distribution systems, and sea/air transportation. The boxes may also be laminated and produced according to specific requirements. Today, there are certain computer-aided design (CAD) systems specifically created for corrugated cardboard packaging.

Life cycle assessments can be applied to packaging because of its unsophisticated nature; a package is unlike a car or washing machine with many components. It is important to visualize the entire packaging life cycle from purchasing to disposal to make well-informed decisions for reducing any negative impact and developing positive effects [10]. The analysis of packaging from a cost perspective and according to its flow through the supply chain is known as life cycle costing (LCC). During the 1960's, the U.S. Ministry of Defense developed LCC for government purchases [11, 12]. LCC was developed further to incorporate the costs of design, production, use, and investment; all cost aspects, including design, development, operation, maintenance, and disposal [13, 14, 15] are analyzed. LCC requires retailers to think proactively by considering all potential costs from purchase to disposal [16].

#### What is the Design Approach Utilized by Olmuksa International Paper Sabanci?

In 1999, International Paper and Hacı Ömer Sabanci Holding formed a joint venture, with each having equal shares. Olmuksa International Paper Sabanci was created, and the company currently operates in various Turkish cities as a manufacturer of corrugated cardboard. The company has received national and international awards since 1990 and is recognized as an industry leader; among the many reasons for this is its unique design approach and a focus on maintaining high quality. The company strives to create value-added solutions; management adheres to the belief that "packaging does not increase cost but it is a cost reduction factor or solution." A primary marketing focus is attracting customers who will purchase from Olmuksa instead of its competitors; therefore, part of the company's vision involves presenting added value to its customers through a reduction in total packaging costs. Cost savings can be achieved by reducing the number of employees assigned to packaging, increasing production, stocking systematically, and limiting transportation expenses. Other solutions include increasing the velocity of

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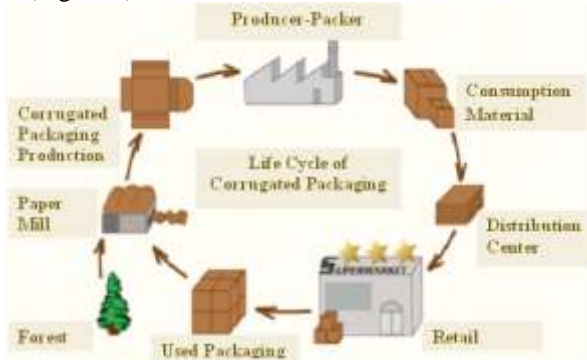
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supply chain flow, limiting the number of packaging materials utilized, and loading transportation vehicles more efficiently.

### Results and Discussion

Olmuksa's objectives are to reduce the customer's total cost and the company's expenses by keeping inventory, labour, waste, production interruptions, and supply time at minimum levels (Figure 1).



**Figure 1** Lifecycle of corrugated packaging



**Figure 2** Washbasin packaging

Based on these goals, the total cost of ownership (TCO) model that initially was used by the foreign partner (IP) was adapted to company operations in Turkey. Two packaging cases representative of this methodology are presented here. In 2005, Olmuksa was the recipient of the "Golden Package" award from the Turkish Standards Institution (TSE) and the "World Star" awarded by the World Packaging Organization (WPO) for its packaging concepts [17, 18]. Olmuksa designed washbasin packaging for the Eczacıbaşı-Vitra group (Figure 2) [19].



**Figure 3** Motorcycle packaging

The cost advantage was realized on the basis of a reduction in the quantity of packaging material per product and a reduction in freight costs per washbasin (due to an increase in the number of products packed in each container). The packaging solution included an outer rolling container and a shock-preventing inner separator. Its trapezoidal form was conducive to efficient use of scrap, while the double thickness of corrugated cardboard prevented damage to the contents. The producer of the washbasin was offered ease of use throughout the supply chain. Olmuksa also developed a motorcycle packaging for Ramzey, a manufacturing company (Figure 3). With this model, the

motorcycle was placed on a metal panel and rolled with corrugated cardboard. Packaging was composed of an outer box and inner partitions produced from AC and ACB flute. Therefore, a motorcycle weighing 93 kg was handled safely throughout all phases of the supply chain. In addition, three motorcycles could be stacked on top of each other due to this packaging solution, and transportation and warehouse advantages were achieved.

### Conclusion

In the first part of this study, packaging and related concepts are defined in detail; information on corrugated cardboard is given; and packaging life cycles and cost evaluations are explained on the basis of the relevant literature. A brief introduction to Olmuksa International Paper Sabancı and its objectives for designing corrugated cardboard packaging to reduce total packaging costs are presented. Actual packaging design examples that fulfilled the company's objectives are also described in detail. The average freight cost associated with shipping a washbasin, for example, was reduced by increasing the number of products packaged in a pallet. A cost reduction was also realized from effective motorcycle packaging, which limited the number of motorcycles that were physically damaged during transport. These two illustrations provide practical evidence for the value of packaging design as a variable for cost reduction in production and distribution of goods. Similarly, cost reduction examples from other branches of industry may supplement the findings of this study and enhance discussions in the future.

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