Integrated Approach to Industrial Packaging Design

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Abstract. The article reviews studies in the field of industrial packaging design. The major factors which influence technological, ergonomic, economic and ecological features of packaging are established. The main modern trends in packaging design are defined, the principles of marketing communications and their influence on consumers’ consciousness are indicated, and the function of packaging as a transmitter of brand values is specified. Peculiarities of packaging technology and printing techniques in modern printing industry are considered. The role of designers in the stage-by-stage development of the construction, form and graphic design concept of packaging is defined. The examples of authentic packaging are given and the mention of the tetrahedron packaging history is made. At the end of the article, conclusions on the key research aspects are made.

1. Introduction
Packaging solves a wide variety of tasks. Packages protect the contents from contamination and damage; facilitate transportation and storage of goods. Packaging enhances the expressivity of advertisement and contributes to a large-scale distribution of goods. The ultimate aim of packaging is to sell the goods that it encloses, and the article aims to find out how it is done.

Packaging symbolizes both the content and consumers’ lifestyle. Modern packaging is a versatile phenomenon, a functional complex that is based on communicative, constructive and material, artistic and figurative components. The omnipresent ideology and puritan manufacturability have become a thing of the past.

At present, packaging has become part of the marketing communication system. Communicative properties of packaging cannot be overestimated. “The appearance of a package is as good a seller as any flesh and blood employee, and even better, because it works day and night for goods and emphasizes only its merits, which are important for the manufacturer”, - Richard B. Frankkin and Carroll B. Larreby [1-7] wrote in ‘Packages That Sell’ in 1928. Packaging is another means to expose the values of a brand. A design should really communicate with consumers and multiply the advantages. According to Andrew Streeter, a European guru in the field of packaging, the design should suit the form, and be monocentered and harmonious. There are not many available forms, which is why a high quality design should be used to the full, confirms Andrew Streeter [2-4].

2. Package manufacturing techniques. A designer’s role in making a package lay-out
Presently, it is difficult to single out one direction in the development of the industry. One of the modern trends is a refusal to label; another trend that is gaining ground is minimalism: calm and clear communications are once again appreciated in the aggressive visual environment of stores. In general, there are a great number of trends. Therefore it makes the discoveries and witty concepts of modern
packaging designers even more unexpected. Undoubtedly, such an original, but at the same time laconic design shows to best advantage among similar products of the segment on store shelves. This fact influences consumers’ positive choice and makes them give their preference to this product owing to the packaging. The first emotional unconscious impulse of a consumer, looking at the shelves with goods, makes him reach out for an unusual package, and only then think about the brand, the product’s quality and its manufacturer Figure 1. Therefore the role of packaging in product advertising is exceptional and unquestionable. And the communicative qualities of packaging are one of the key aspects in the integrated approach to packaging design [2,3].

Figure 1. Laconic and original packaging.

With time packaging has become even more necessary to protect goods from the risks associated with their transportation and environmental conditions. At present, packaging should be simply manufactured, inexpensive with regard to the product which it encloses, durable and protective, and comply with environmental standards, including the possibility of recycling [4], Figure 2.

Figure 2. Not expensive packaging.

Moreover, the form and design of packaging should differentiate the product. The development of form and graphic design are very close concepts. One must be in keeping with the other. The graphic design and form of branding should harmonize. All of this can be achieved by means of form [5]. It is
important to take into account the entire lifetime of a package when it is still being designed. First of all, every packaging design should achieve less material cost, without damaging its protective function. Each unit is delivered to the product and then, having made together with the product the way from the place of its production to retail sale, goes to waste. Costs in terms of energy consumption and environmental pollution can be significantly reduced if designers can use lighter materials in a smaller amount.

Although there is an extensive range of standard constructions, in a continually saturated market, there remains a large extent of creative and innovative activities in the field of packaging design. Artfully made, ergonomic and often simple forms of packaging design can win in the market, giving clients a great advantage over their competitors. Often it becomes far more important than the limited and temporary success achieved by direct advertising and marketing slogans. A constructive approach to the designed packaging is determined by various factors, ranging from ergonomics and optimization of the package shape to transportation logistics of the advertised packaging. If a designer is able to get a smaller package, without reducing its efficiency, more items can be shipped each time, as it is economically unprofitable to transport great volumes of “air”. Since the industry imposes serious requirements on designers, thereby significantly limiting and restricting the potential scope of creating original packaging, designers’ task is to keep on searching for creative and daring solutions, and to induce the industry to constantly expand the boundaries of production, and thus facilitate the implementation of the successfully elaborated design concepts Figure 3.

![Figure 3. Example of packages with a non-standard construction.](image)

The techniques of manufacturing packaging materials and packaging itself are constantly developing. The packaging industry solves the resource problem by putting into operation the advanced techniques of obtaining new types of packaging, developing and obtaining light materials for producing stronger light cardboard boxes, enhancing strength by improving the design quality and using less material. Not less important in packaging design is its upcycling and, finally, its recycling at the end of the utilization cycle. The manufacturing cycle and packaging output is a complex technology of packaging production, a set of independent technological operations, determined by regulatory requirements for packaging products, market requirements and consumers themselves [6]. Perhaps the most popular form of packaging nowadays is cardboard packaging. To produce a cardboard box, a cardboard sheet has to pass three stages of manufacturing. In the first stage, a color print is applied to the cardboard sheet (mainly using offset printing) to get the necessary styling approved by the client [7,8]. To transfer graphic elements on a box, other printing methods may be
used, for example, embossing or using a flexographic sticker. The second manufacturing stage is die-cutting, which results in obtaining the required contour blank, i.e. the main element of the box on a flat sheet Figure 4.

![Die-cutting machine](image)

**Figure 4.** Die-cutting machine.

The machine also scores or creases folding lines, and surplus material goes to waste. Then, the blank passes through the third final stage when the final pre-assembling operations are performed. It can be cutting out of openings (windows) in panels, gluing, varnishing or coating with other substances to protect the cardboard sheet from harmful effect of the environment where it is to be used. When elaborating the model of a cardboard article, designers should keep in mind that packaging requirements determine the very essence of its design, style and the choice of material. Designers should take into account the product’s nature, because it determines the way of package filling, and the latter influences the design itself. If a box is filled manually, its assembly should be simple and easy. If it is filled mechanically, the designer should understand the possibilities of the technological process. For example, if a box has to be sealed or if a locking device (lock) and many other ways of package transformation when it is used by a consumer have to be provided [9-14] Figure 5.

![Example of a locking device](image)

**Figure 5.** Example of a locking device.

### 3. Conclusion

Summarizing the research results, it can be concluded that the process of packaging creation is a complex, multi-stage, technological, artistic and emotional process that requires time, a designer’s talent and a modern, technically equipped printing plant. But the inevitability of these factors leads to the appearance of an authentic and brilliant design product destined to serve consumers, satisfy their
hopes and dreams, and enhance their life status in a qualitative manner. And in this regard, designers are one of the main and fundamental elements in fulfillment of that very dream, without which the world will become dull and ordinary

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