

## **Implementing new products the chance of furniture industry development**

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**Abstract:** *Implementing new products the chance of furniture industry development* The aim of this paper is to draw attention to the possibility of more efficient utilization the Polish furniture industry potential. Furniture manufacturers should consider: quality, innovation and customer-oriented product, already at the level of product design. The process of new product development (NPD process) can be supported with appropriate tools and techniques, which task is to focus of attention the design team to create a product consistent with customers' expectations and achievement the success on the market.

**Keywords:** New product development (NPD), tools and techniques, furniture industry, new product;

### **INTRODUCTION**

The specificity of industrial activities in a significant degree is determined by its innovative potential and development perspectives. The wood industry is a particular area, as based on natural, ecological and renewable raw material which is wood.

Emphasised from the wood industry sector – the furniture industry dominates among the other branch of that sector in terms of businesses numbers, employment and production value (Ratajczak 2009). In addition, the furniture market is open to international competition, which favors increasing the turnover by the manufacturers, but also requires from them to become more involved in the maintenance (or improvement) achieved market position. Two basic strategies dominate which with this end in view are chosen by domestic manufacturers: a cost-cutting strategy and a strategy for improving advanced manufacturing technologies that will enable them to achieve more differentiated products as the base of higher position on the market of the furniture higher class (Mamica 2004). In European terms the cost reduction strategy does not bring long-term effects because China – a leading furniture exporter developing rapidly since the mid-1990s and in 2004 China outclassed Italy from the leader position in the rating on the biggest world's exporter of furniture (the position is maintained until today) - is unbeatable in terms of winning cheap labor over and obtainment the low production costs. With this in mind, the Polish furniture producers should bet on quality and innovation, as the main factors of development and take advantage of favorable Poland location in Europe and lower production costs in Poland than in Western European countries (Han 2009, Mamica 2004).

Matejuk (2003) points to another development factor - Polish furniture producers in order to become competitive on the European market must search a specialization not at the level of the industry branch but at the level of individual products. Therefore, it is very important that manufacturers of furniture, take account of all three factors: quality, innovation and customer-oriented product, already at the level of product design.

### **COMPETITION DIRECTIONS IN THE FURNITURE INDUSTRY**

The world trade of furniture has increased rapidly during the past two decades. On this fact has contributed new solutions and opportunities in the field of packaging, transport and assemble of furniture, opening up new markets as well as reducing of trade barriers. As a result, the world trade of furniture has increased from US\$42 billion in 1997 to US\$97 billion in 2007 (Han 2009).

The main furniture exporters are China today. Despite the fact that since 1996 their market share has been steadily increasing, this does not mean, however, that furniture's giant do not need to take any action in order to maintain or improve sales performance. In terms of quality and unit price, China is still falls behind traditionally strong competitors such as Italy and Germany. The counterweight to the cheaper Asian labor slowly become: well-known brand, quality, recognizable patterns, and 'specialization' in the given type of product. It is also experiencing a growing challenge from countries such as Poland and Vietnam. Xiao Han (2009) straight points out that emerging countries (Poland and Vietnam) are expanding their export market rapidly as well. China doesn't still have their own brand and updated technology, on the contrary to Poland. Moreover, Poland advantage is its location in Europe, which provides access to the West European market. Almost 90% of our production has been exported, 78% of which has been transported to EU countries (in 2002; Han 2009). Poland has become an export-oriented furniture producer.

#### PROCESS OF NEW PRODUCT DEVELOPMENT IN FURNITURE INDUSTRY

One criterion for innovation is the ability of firms to introduce new product designs or their significant modification (Mamica 2004). Unfortunately, unfair competition, and a negligible chance of protecting their property rights for utility models often leads to the fact that furniture producers reduce spending money on: research and development, product design and implementation process of the product on the market. Taking that decision inhibits, ipso facto, business development and customer expectations in relation to manufactured goods are imported into the background the company policy. The manufacturer no longer reaches the needs of buyers out.

Especially in micro enterprises (study group of 46 furniture manufacturers; Mamica 2004) the dominant model for the gaining of the design of new products is a reproduction of the available designs or use your own creativity, which usually is not based on professional grounds. Using the services of designers in the furniture factories in the micro sector, is a rare phenomenon. Studies conducted in 2009 among the 55 Polish furniture producers (Fabisiak 2009), however, show that in 2005-2008, 68% of surveyed companies admitted that it has made investments in the field of new product development or modernization (modification) of previous designs. Manufacturers also declared that the most important factors determining their decision on the development of products are: customer expectations, the desire to achieve competitive advantage and strengthening brand in the market.

Referring to the studies conducted on the Spanish market (March-Chorda 2002), it can be noted that the furniture industry has the potential to exploit the new product development process to enhance competitive advantage in the market.

The possibility of relatively rapid introduction of new furniture on the market is connected with appropriately carried out the product design process (from idea generation through: customer's expectations researches, designing and engineering project, up to a prototype). Other determinants of the product implementation in the furniture industry are presented in table 1 (tab. 1).

**Table 1.** Conditionings for carrying out the development of new products in the furniture industry

<b>Environment of process of the new products development</b>	<b>Furniture industry</b>
<i>Technical uncertainty</i>	Traditional character of the sector and its products; standardized raw materials and production processes; technological dependency on the suppliers and raw materials;
<i>Attitude of the market</i>	The conservative attitude of the market is connected with a discouragement factor in the promotion of novelties;
<i>Potential of innovations introduction</i>	Stable, traditional sector with a low potential for product

	innovation, not going further than simple design modifications; the high rate of segmentation in this sector makes it difficult to penetrate new segments through the development of new products;
<i>Failure rate of product innovation</i>	The sector immune to failure problems in innovation because of a low degree of changes introducing into new products;
<i>Process development of new products</i>	The sector belongs to industries which require less time for NPD, for the most part due to the continuity of their product range. The rapid development of new products requires only the participation of design activities;
<i>Period of useful product life before undergoing modification</i>	Products remain unchanged probably for longer than they should;
<i>Time of NPD process</i>	About 2-6 months; relatively short period of NPD with reference to the global average cycle time (about 1 year);

Source: Own study (based on March-Chorda 2002);

### SELECTION OF NPD TOOLS AND TECHNIQUES

Utilization of appropriate tools and techniques in the NPD process can assist firms to achieve better performances in launching new products on the market. However, in practice, many useful tools and techniques are not utilized effectively (Yeh 2008) or in general they are ignored - manufacturers act intuitively.

**Table 2.** NPD tools and techniques

No	NPD tools and techniques	Description of tool / technique
1	<i>Quality functional development (QFD)</i>	Taking into account at all stages of designing the largest possible number of factors which may affect product quality or manufacturing processes. Also, "translation" customer expectations in relation to the product into technical language.
2	<i>Project management</i>	Realization of established aims by means of concrete activities and in appointed time.
3	<i>Design of experiment (DOE)</i>	Utilization of experimental methods to determine and optimize factors affecting the quality of the process and product.
4	<i>Concurrent engineering (CE)</i>	Different stages: design, implementation and testing of the prototype, marking the amendments and correction, and then designing and making the instrumentation, are - if possible - making in parallel. The information are passing on a continuous basis.
5	<i>Failure model and effect analysis / Design failure model and effect analysis (FMEA/DFMEA)</i>	Identification of potential defects and the reasons causing it. It consists in estimating the risk of emergence the defects in the product or process, describing the causes and their significance, and propose solutions on the basis of preventive or corrective measures.
6	<i>Collaborative design</i>	The common use of design techniques and product development to improve products launching on the market in order to they will be successful.
7	<i>Taguchi method</i>	The product designing should be carried out in three stages: system design, design of system parameters and tolerance design .
8	<i>Design for six sigma (DFSS); Six sigma program</i>	Improving the quality makes sense only if benefit by customers and organizations. The aim of DFSS is to improve financial performance through quality improvement (tools and methods of quality management).
9	<i>Benchmarking</i>	Analysis and implementation of solutions used by competitors.
10	<i>Design for assembly (DFA); Design for manufacturing (DFM)</i>	DFA – designing products easy to assembly, DFM – designing products easy to production,
11	<i>Product data management (PDM)</i>	Enable the collection and sharing of data about the structure of the product, its documentation and its manufacturing processes, including the possibility of processing in the database.
12	<i>Group technology (GT)</i>	Establishing a standard process technology for a set of technologically similar products.

13	<i>Computer-aided systems (CAD): manufacturing (CAM), engineering (CAE)</i>	Improving the design work, while - through the work of the network - the parallel tracking of course all the work involved. Any discrepancies can be quickly eliminated.
14	<i>Conjoint analysis</i>	The method enables manufacturers to know more customer demand, to measure their preferences and to examine similarities and differences between alternative options to choose from a wide range of products.
15	<i>Fishbone analysis</i>	The presentation in graphical form a set of factors affecting the final outcome of the process.
16	<i>Value analysis / Value engineering (VA/VE)</i>	Analysis of the project in order to eliminate waste before and after the commencement of production.
17	<i>Theory of inventive problem-solving (TRIZ)</i>	The method of complex solving problems that is how to integrate the two contradictory demands in one system?
18	<i>Knowledge management (KM)</i>	Attempt to make the best use of knowledge that is available in the organization, creating new knowledge and increasing its understanding.

Source: Own study (based on: Yeh 2008, Hamrol 2008)

In the Polish companies from the furniture industry highlights, so far, only one tool for supporting the design of new products: CAD software. They use also some systems for collecting data e.g. CRM (Customer Relationship Management) (Fabisiak 2009). Meanwhile, there are several dozen of methods and tools used successfully all over the world in various industries. Survey and brief description of the most important are presented in table no 2 (tab. 2).

#### SUMMARY

The furniture is the industry which potential has not yet been fully exploited. Furniture manufacturers in order to become competitive on the European market must look a specialization not at the level of the sector, but at the level of individual products. For this purpose, some methods and tools for designing products (tab. 2) should be implemented in the furniture factories.

However, there is lack of researches that would answer to the questions: how exactly is the NPD process acting now in the furniture factories? which the NPD tools and techniques are they using now? and launching which of them would be good? and most importantly - how the NPD process must occur in order to be effective and bring the expected profit? Ratajczak (ed., 2010) among mentioned the desired trends in the Polish researches from scope of wood science also points to: "analyze the effectiveness of the implementation of new technologies and products (...)".

In connection with the gap in the current area of research, and noticing the importance of issues taken on in this publication, the subject will be continued.

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**Streszczenie:** *Wdrażanie nowych produktów szansą na rozwój meblarstwa* Celem niniejszej publikacji jest zwrócenie uwagi na możliwość efektywniejszego wykorzystania potencjału polskiego meblarstwa. Producenci mebli powinni uwzględniać: jakość, innowacje oraz zorientowany na klienta produkt, już na poziomie projektowania wyrobu. Sam proces rozwoju nowego produktu może zostać wsparty poprzez stosowanie odpowiednich narzędzi i technik, które mają za zadanie ukierunkować zespół projektowy do wykreowania produktu zgodnego z oczekiwaniami klienta oraz do odniesienia sukcesu na rynku.

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