

## **Analysis of aspects of product warranty and reliability in selected furniture manufacturing companies**

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**Abstract:** *Analysis of aspects of product warranty and reliability in selected furniture manufacturing companies.* The aim of the study was to recognize the awareness of the significance of the reliability based furniture design in the process of new product development. Data collected through direct interviews and surveys conducted among 75 furniture manufacturing companies was subjected to a comprehensive statistical analysis. The results of the research were presented focusing on the manner the enterprises use information concerning product reliability and quality as well as the length of warranty period in the process of creating and launching new products into the market.

*Keywords:* warranty period, furniture design, reliability, furniture companies

### INTRODUCTION

Product is a complex category. When starting the design process, apart from the external form, construction and functional features of the product also so called augmented product (that is non tangible benefits that a product can offer) must be therefore considered (Kotler, Armstrong 2010). The high level of competition on the market makes it necessary to focus on those aspects that can contribute to improving the competitiveness of the product and distinguish it from others. One such method may be to ensure reliability and good quality of a piece of furniture as well as the sufficient duration of the length of the warranty period for the product, which are named among the factors influencing consumers' decisions related to the purchase of furniture (White 1992; Ginalski *et al.* 1994; Rutkowski 2006; Murthy 2007).

Taking the above into consideration the aim of the study was to investigate if and in what manner Polish enterprises manufacturing furniture include quality, reliability and the length of warranty period in the process of creating and launching new products into the market.

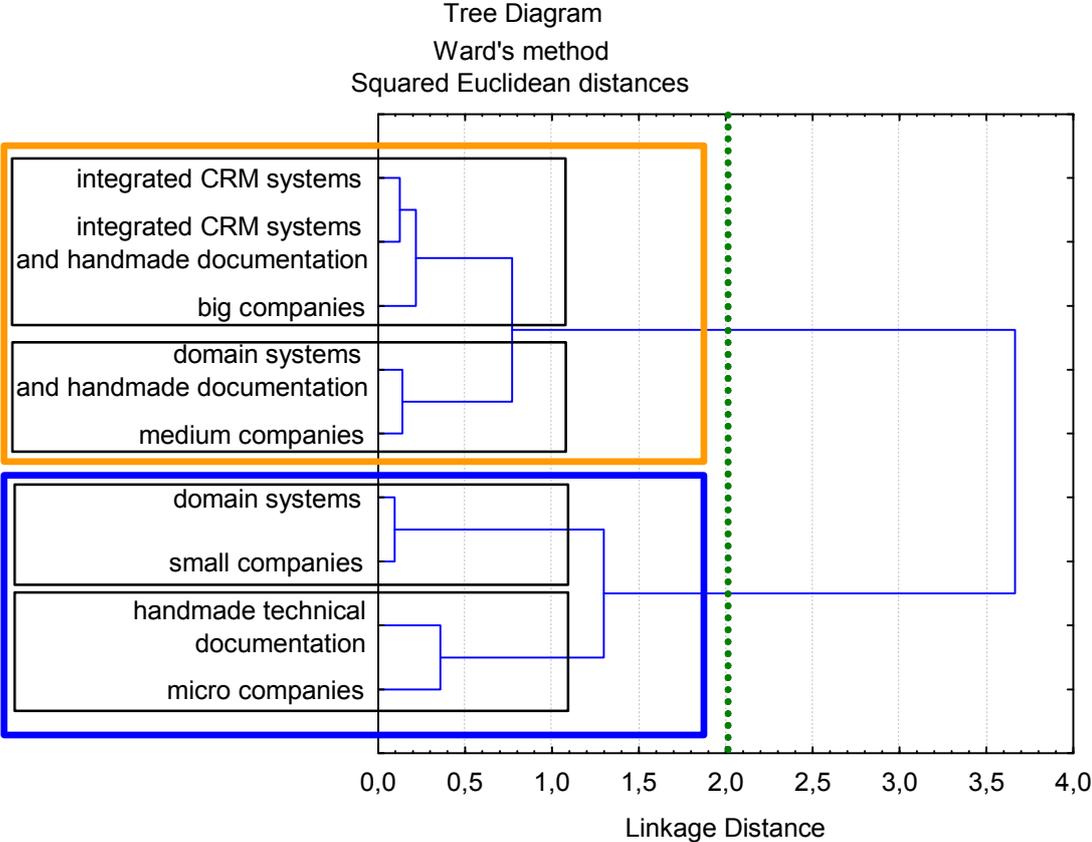
### MATERIAL AND METHODS

It was decided to collect data concerning the above subject using questionnaire studies and direct interviews. The assumed population size was 100 furniture factories located in Poland. Additionally in the group of 20 enterprises manufacturing case type furniture, interested in the subject area of product reliability more detailed direct interviews were conducted. Collected data were coded and next subjected to comprehensive statistical analysis with the use of STATISTICA 10.0 PL software. Data analysis was performed applying the statistical grouping method, taking into account the division of the units based on company size criterion.

### RESULTS AND DISCUSSION

Taking into consideration the percentage of returned questionnaires, their completeness and the number of direct interviews performed, it was decided to conduct further analysis based on data coming from 75 units. While analysing the usage of information on product quality and reliability in the process of furniture design it is crucial to

gather the facts on the manner the data concerning designed products are collected and elaborated. According to the results of the research the organization of design process is strictly associated with the size of the company. The graphical presentation of correspondence analysis results (performed using Ward method) shows that the studied companies can be divided to two main groups and four subgroups (Fig. 1).

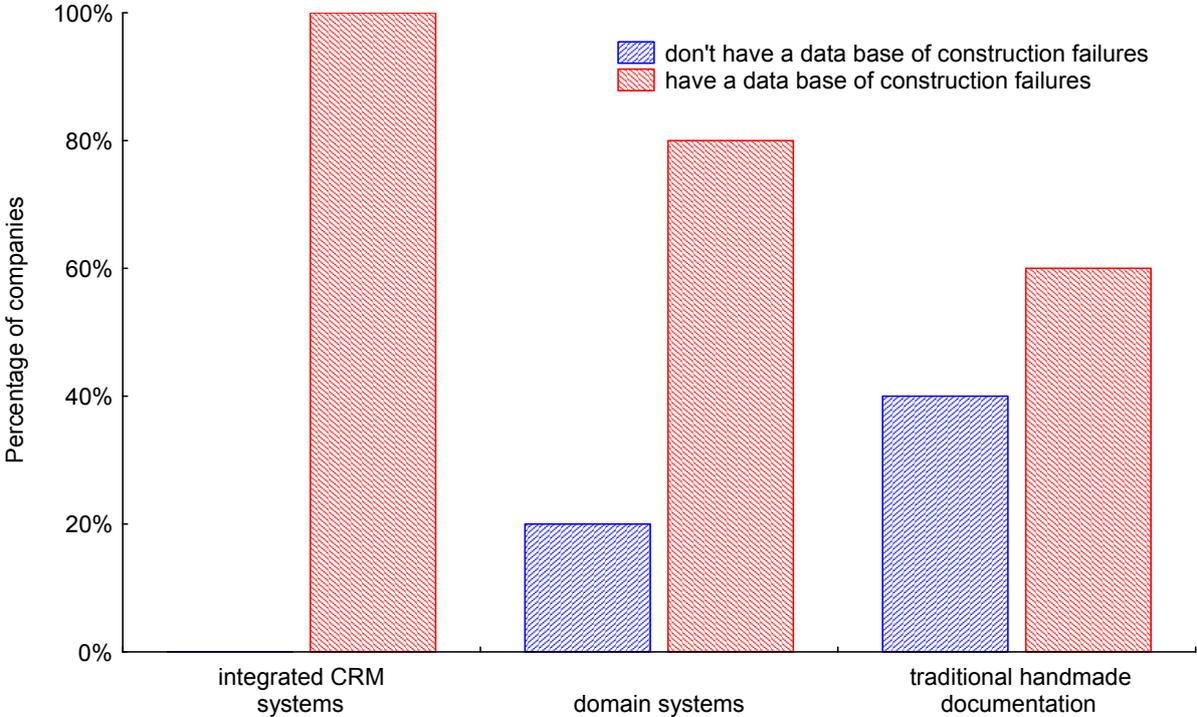


**Fig. 1** The cluster analysis results for variables describing the level of employment and the manner of collecting and processing the data about the designed products  
Source: Own elaboration based on performed empirical research

The first main group consists of big and medium companies which use integrated informatics systems in their activity as well as individual PC stations, often aided by traditional, handmade technical drawing documentation. In this group of organizations two subgroups can be distinguish, namely a subgroup of big organizations employing over 250 employees in which the processes of designing and manufacturing are based on the implemented integrated CRM systems, aided in some cases with handmade drawings and documentation. The second subgroup consists of medium enterprises using individual PC stations and special CAD computer systems in the process of furniture design. Individuals designing furniture in the described subgroup often apply also sketches and technical drawings made by themselves. Micro and small companies create in turn another separate main group of organizations in which creating new pieces of furniture is based mainly on handmade documentation or computer aided design systems. Also in this group of enterprises two subgroups can be distinguished. Since majority of micro companies applies traditional, paper form of making design drawings, these enterprises create one subgroup. Another subgroup consists of small enterprises applying the informatics solutions in a form of CAD systems. The cluster analysis results confirmed the grouping achieved as a result of performed correspondence analysis.

When describing the application of information on product quality and reliability in the process of furniture design it is also essential to consider the collection and elaboration of data on the most frequent failures occurring in the manufactured furniture constructions. Gathering and processing data concerning quality and reliability of the manufactured products is strictly connected with the organization of design process described above, company size and production scale. According to the results of the conducted investigations as much as 20% of companies do not have a data base of the failures occurring most frequently in the manufactured furniture constructions. The detailed analysis performed using the statistical grouping method, indicated that all of them employ less than 50 employees and produce furniture in small series or their production is made to order.

Furthermore, the obtained results show that all the companies using integrated CRM systems do have a data base of failures that is developed based on the data coming from customer complaints analyses (Fig 2). This information is used while designing new pieces of furniture. For companies, which store documentation about manufactured products using traditional, manual methods or domain systems meaning a single PC station equipped with an appropriate software, the procedure of collecting the data on construction failures is less frequent (60% and 80% respectively).



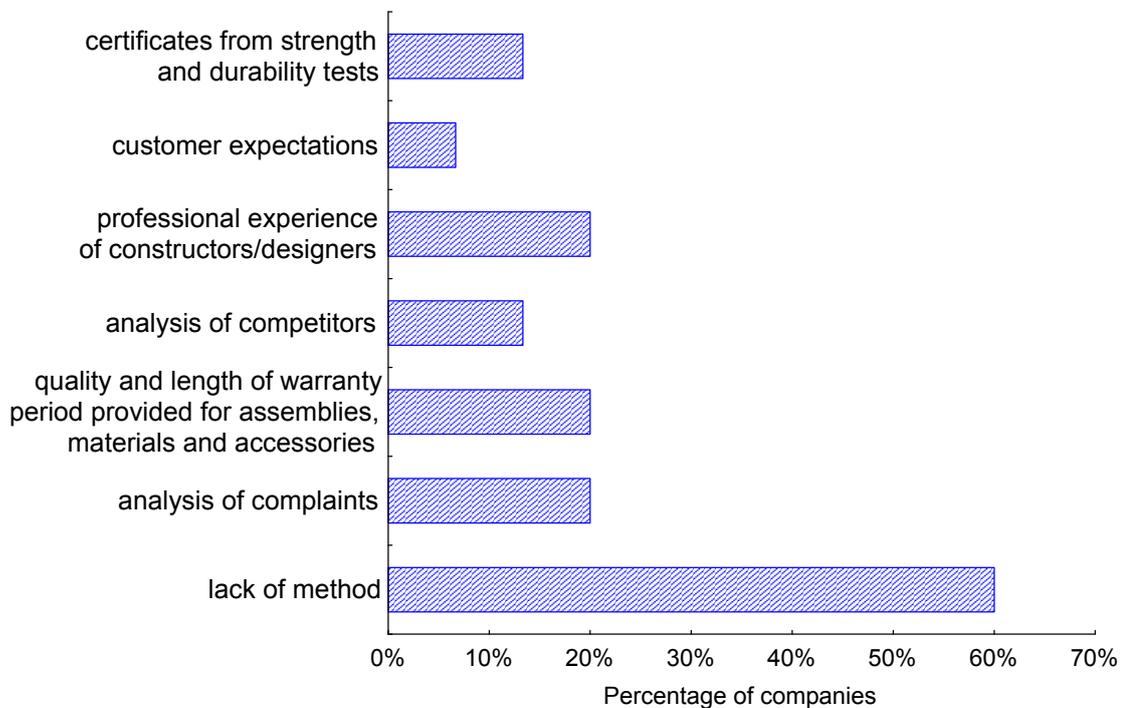
**Fig 2** Having a data base of the failures occurring most frequently in the manufactured furniture constructions depending on the manner of collecting and processing the data about designed products  
 Source: Own elaboration based on performed empirical research

In view of the increasing influence of non-price factors on the process of furniture purchase, that is among others those related to the quality and reliability of the product, surprising is the fact that only 53% of the studied companies use information on the length of the warranty period of its products in its advertising and marketing materials.

While analyzing reliability and warranty issues in the surveyed companies it was decided to examine also the length of the warranty period provided by manufacturers. It should be noted that the majority of the studied companies (86%) retains the statutory minimum warranty period, indicating time of manufacturer’s liability for the product defects as two years. Some of the surveyed companies (27%) offer an extension of this period

depending on the quality of assemblies used or employment for installation of furniture certified, by a given company, team of assemblers.

Another important problem that needs to be analyzed is the method of determining the warranty period for manufactured products. Results of the study show that for more than a half of the examined enterprises (60%) the length of the warranty period for furniture is not defined in any specific manner (Fig. 3), which is confirmed by employing the warranty period required by law.



**Fig. 3** The basis for estimation of warranty period provided for manufactured furniture  
Source: Own elaboration based on performed empirical research

Taking into account the companies that apply other criteria for determining time guarantee, professional experience of furniture constructors and designers (20%) as well as the conclusions drawn from the analysis of historical data on complaints submitted by consumers (20%) and the quality of materials and accessories used need to be listed. In addition, the following criteria were also taken into consideration: the analysis of warranty period provided by competitors (13%), certificates and documentation from strength and durability tests of furniture (13%) and consumer expectations (7%). It is worth noticing that companies were often indicating several methods helping them to estimate the warranty period. Thus the results presented in Fig. 3 are not summed up to 100%. It should be emphasized, however, that the percentage of companies taking into account the above factors is low. The mentioned characteristic is of crucial importance since it demonstrates that the awareness of the significance of the reliability based furniture design is insufficient in the examined furniture manufacturing enterprises.

## CONCLUSIONS

Taking into consideration the results obtained through direct interviews in furniture manufacturing companies the following conclusions can be drawn:

1. In the surveyed companies the degree of usage of information regarding the warranty period in marketing and advertising materials is low and amounts to 53%. Entrepreneurs do not recognize the importance of product reliability and also the

length of the warranty period as important factors that determine the purchase of furniture.

2. Just 40% of companies make attempts to estimate the length of the warranty period for the manufactured products. Companies do not have the appropriate tools enabling them to determine the warranty period in a professional and calculable manner.
3. It is arguable to develop guidelines for determining the length of the warranty period for the whole furniture construction allowing engineers and designers to adapt it to the capacities of the enterprise and to the product strategy applied for the given furniture collection.

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**Streszczenie:** *Analiza zagadnień gwarancji i niezawodności produktu w wybranych przedsiębiorstwach meblarskich.* Celem artykułu było przeprowadzenie badań nad znaczeniem niezawodnościowego projektowania mebli w 75 przedsiębiorstwach produkcyjnych zlokalizowanych na terenie Polski. Dane uzyskane w wyniku wywiadów bezpośrednich i badań ankietowych zostały poddane kompleksowej analizie statystycznej. W pracy zwrócono szczególną uwagę na sposób, w jaki analizowane firmy wykorzystują informacje dotyczące niezawodności i jakości wytwarzanych wyrobów, jak również długości okresu gwarancyjnego w procesie kreowania i wprowadzania na rynek nowych produktów.

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