Quality management in polish industry of solid wood furniture – tools, systems, approach

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Abstract: Quality management in polish industry of solid wood furniture – tools, systems, approach. Quality management systems and tools used in the solid wood furniture industry in Poland were mapped in the scope of the research. The results show that companies leading in the solid wood furniture production are interested in optimizing cost of poor quality, by implementation of available systems and tools (ISO, Lean, Six sigma, 7 basic quality tools). However, the potential of the known methodology is not fully utilized due to certain reasons, such as production setup and raw material specificity.

Keywords: quality, lean, six sigma, seven basic quality tools, wooden furniture production

INTRODUCTION
In today’s world of innovation and growing global competition in business, more and more companies are aware of the value of customer. The Customer oriented approach to the business influence every area of their business: starting at range design, through production and service, finishing at organisation and culture (Begg 2000). The customers simply expect better products in lower prices. On the one hand it is about cost optimization during the production process (material yield, handling cost, processing time etc.), but on the other hand it is also about minimizing cost of poor quality (claims, rework, scrap). This is one of the main reasons why the representatives of wooden industry in Poland started to look for new working methods with quality in focus. Among available solutions Seven Basic Quality Tools should be mentioned. Flow Chart, Control Charts, Fishbone Diagram, Histogram, Scatter Chart, Pareto Diagram and Check Sheet, commonly called also “The Magnificent Seven”, are used for production problems solving, planning and technology development etc. (Węgrzyń, 2012). They also support the process of common requirements and standards implementation in the whole organisation. The Quality Management System according to ISO 9001 requires that company policy is oriented on continues fulfilling quality requirements for products and process. On the top of quality tools and systems Lean Manufacturing, often defined as “philosophy of management” can be introduced to the factories looking for working methods improvement and competitiveness development (Sobiś, 2007). Lean is a set of tools and working methods oriented on waste elimination in all aspects. One of the basic assumptions of lean is also continuous improvement. All of above are focused on data gathering, analysing and using them for right decision making. This lead to the cost reduction and customer satisfaction increase.

METHODOLOGY OF RESEARCH PROCEDURE
The research was carried out in 10 polish production companies leading on the solid wood furniture market. The surveys about quality systems and tools usage was performed. The main purpose of the study was to map how the small (employment below 50 co-workers, or turnover less than 7 MLN EURO/year), medium-sized (employment 50 - 250 co-workers
or/and turnover 7 – 40 MLN EURO/year) and large companies (more than 250 employees or/and turnover higher than 40 MLN EURO/year) ensure quality. Quality Department existed in each of the assessed enterprises. The number of co-workers belonging officially to quality department was defined as 2 – 26, without strict correlation to the company size.

RESULTS AND DISCUSSION
The results of analysis done as a part of quality management study in polish solid wood furniture production companies are visualised in the diagrams Fig. 1, Fig. 2, Fig. 3.

**Fig.1.** ISO 9001 certified companies – overview among polish producers of solid wood furniture

**Fig.2.** A graph showing the percentage of enterprises producing solid wood furniture in Poland working with Lean

**Fig.3.** A graph showing the percentage of enterprises producing solid wood furniture in Poland working with Six Sigma

The above diagrams show, that 75% of furniture factories taking part in the survey was not certified according to ISO 9001, lean management was not used at 30%, and six sigma was implemented only by 10% respectively.
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Quality inspection systems at production units were analysed additionally. The most common forms of quality inspections, including different production stage were included in the survey. The results are shown in the diagrams Fig. 4 and Fig. 5. The axis “x” shows the number of answers confirming the use of certain methodology.

Fig. 4. Forms of quality control in the factories producing solid wood furniture in Poland
It was concluded, that:
- none of solid wood furniture producers control critical to quality production parameters online;
- most manufacturers inspect quality on different production process stages (starting and incoming goods inspection, finishing on final control of ready products);
- none of surveyed factories do not have statistical process control implemented;
- quality control plans are usually based on producer’s experience.

The study of survey results additionally showed that other types of quality control are in use, e.g. mechanical tests of ready product from every production batch in internal laboratory, or interdepartmental control gates.

Information about Basic Quality Tools usage by furniture producers located in Poland was delivered by the research, simultaneously. The results are shown as diagram in Fig. 6.
All respondents confirmed the Customer oriented approach to the production process and the final product. The Customer feedback lead to the improvements of the furniture or/and production process, depending on the case.

In accordance to declared methods of working with quality, the most common tool used by assessed companies is Ishikava Diagram (Fishbone Diagram, Cause-and-effect diagram), Pareto Diagram and Flow chart. Nevertheless, some of the Basic Quality Tools is not used by leaders in solid wood furniture business, e.g. Control Charts, Scatter Diagram.

CONCLUSION
1. The potential of well known quality management systems and tools (ISO, Lean, Six Sigma) are not fully used among solid wood furniture producers in Poland. This can be defined as a lost potential for cost decrease.
2. The specificity of raw material and production process (coupled, multi-stage, production nests domination) are defined as a main obstacles for above systems direct implementation.
3. Basic Quality Tools are used by polish leaders in solid wood furniture production (Ishikava Diagram, Pareto Diagram, Flow Chart). However, the high potential of known solution is still not fully utilized.

REFERENCES

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