



# Wood and Furniture Industry in Times of Change – New Trends and Challenges



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## **Wood and Furniture Industry in Times of Change – New Trends and Challenges**

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## FOREWORD

The Proceedings from the international conference titled “Wood and Furniture Industry in Times of Change - New trends and challenges, WoodEMA 2012” is published within the 5<sup>th</sup> year of this important international event that is organized at the University of Ss. Cyril and Methodius in Trnava, Slovak Republic in 2012. The conference will be held under the auspices of the Rector of the University and the Dean of the Faculty of Mass Media Communication. The conference is organized in the year of 15th anniversary of foundation of the University of Ss. Cyril and Methodius in Trnava.

Despite the fact that the conference specifically focuses on the timber industry, the papers of foreign and local experts deal with different areas of interest and research. For this reason, the papers were divided according to the following topics:

Management, marketing and communication, Economy and business and New trends and challenges in woodworking industry.

The main objective was to summarize the knowledge of authors from a professional and practical point of view and prepare a comprehensive material that may serve as an important basis of information about current trends and opportunities in wood processing industry, as one of the important sectors of national economies of countries from which the experts and authors of individual papers come.

Due to the fact that many organizations doing business in the global environment are exposed to different competitive pressures, the basic theme of published papers is highly topical and can be the basis to solve complex problems by sharing knowledge and skills on the level of the so-called best practice.

Renata Nováková  
editor

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**CHAPTER 1**

**MANAGEMENT, MARKETING AND COMMUNICATION**



# CERTIFICATION DOCUMENTATION FOR RESPONSIBLE FOREST MANAGEMENT IN PRACTICE

*Kristina Bičanić – Krešimir Greger – Tomislav Grladinović –  
Ivana Perić – Vanja Čošić*

## **Abstract:**

Due to increasing environmental awareness of consumers the idea of the use of products originating from forests managed in an economically responsible way was born. In response to global deforestation in 1993 in Bonn FSC<sup>®</sup> (Forest Stewardship Council) organization was founded. FSC certification includes five main requirements related to: quality system, input materials control, control and evidence production, usage of FSC trademark, supporting documentation. Products that carry the FSC mark can easily be proved the origin because the chain of custody requires traceability documentation from forest of origin to manufacture or delivery of the finished product to the customer, which means that all involved in the chain have to be FSC certificate holders. This paper presents an overview of requirements FSC certification and all necessary documentation which allows tracking traceability.

## **Key words:**

FSC<sup>®</sup>, chain of custody, certification documentation, requirements

## **1. Introduction**

FSC is non – profit, non – governmental organization that promotes environmentally appropriate, socially beneficial and economically responsible forest management. FSC certification is a voluntary, holding the certificate organization supports responsible forest management. The FSC label ensures that the product is from responsibly managed forests and origin is verified from forest through the whole supply chain.<sup>1</sup>

FSC organization was established in 1993 as response to global deforestation, after three years consultations involving various stakeholders in order to define generic standards for “good forest management”.

FSC is an international association of members consisting of a diverse group of representatives from environmental and social groups, the timber trade and the forestry profession, indigenous people's organizations, responsible corporations, community forestry groups and forest product certification organizations from around the world. FSC has a unique governance structure that is built upon the principles of participation, democracy and equity.

FSC is based on three levels of decision making: The General Assembly of FSC Members, The FSC Board of Directors and The Director General.

The General Assembly of FSC Members is the highest decision-making body in FSC and is made up of the three membership chambers: Environmental, Social and Economic, which are further split into sub-chambers North and South. The purpose of the chamber structure is to maintain the balance of voting power between different interests without having to limit the number of members.

The FSC Board of Directors is accountable to the FSC members. It is made up of nine individuals who are elected from each of the chambers for a three-year term.

The Director General, with the support of a multicultural professional team at the FSC International Center in Bonn, Germany, runs the FSC on a day-to-day basis.

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<sup>1</sup> \*\*\*www.fsc.com

The FSC Principles and Criteria (P&C) describe how the forests have to be managed to meet the social, economic, ecological, cultural and spiritual needs of present and future generations. The principles include managerial aspects as well as environmental and social requirements. FSC rules are the strictest and FSC's social and environmental requirements the highest. The FSC P&C form the basis for all FSC forest management standards. Based on these 10 principles, the FSC has developed further rules (called policies or standards) that define and explain specific requirements.

#### FSC Principles and Criteria:

- Principle 1 Compliance with all applicable laws and international treaties;
- Principle 2 Demonstrated and uncontested, clearly defined, long-term land tenure and use rights;
- Principle 3 Recognition and respect of indigenous peoples' rights;
- Principle 4 Maintenance or enhancement of long-term social and economic well-being of forest workers and local communities and respect of worker's rights in compliance with International Labour Organization (ILO) conventions;
- Principle 5 Equitable use and sharing of benefits derived from the forest;
- Principle 6 Reduction of environmental impact of logging activities and maintenance of the ecological functions and integrity of the forest;
- Principle 7 Appropriate and continuously updated management plan;
- Principle 8 Appropriate monitoring and assessment activities to assess the condition of the forest, management activities and their social and environmental impacts;
- Principle 9 Maintenance of High Conservation Value Forests (HCVFs) defined as environmental and social values that are considered to be of outstanding significance or critical importance;
- Principle 10 In addition to compliance with all of the above, plantations must contribute to reduce the pressures on and promote the restoration and conservation of natural forests.<sup>2</sup>

## **2. Certification process**

FSC does not issue certificates itself. The certification process is carried out by independent organizations called certification bodies that assess forest management and chain of custody operations against FSC standards. Only FSC accredited certification bodies are authorized to issue FSC certificates.

Certification process starts with application. Organization completes an application form, including types of products to be certified and locations. Signed certification agreement is beginning of certification process. Certification body provides information about the requirements for FSC certification. When organization is implemented applicable standards and prepared for certification, on-site visit by third party audit is conducted.<sup>3</sup> Third party audit is when auditor audits client facilities and reviews applicant's control systems and accordance with applicable requirements. After on-site visit, auditor is responsible for objective report of organization's compliance with applicable standards. Auditor's report is reviewed by Certification Body and on the basis that report certification decision is made. Certification body makes the final certification decision. Applicant is informed about audit report findings, including any requests for corrective action. FSC certification includes surveillance audits.

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<sup>2</sup> \*\*\*www.fsc.com

<sup>3</sup> \*\*\* Cabbage, F; Moore, S; McCarter, K: *Impacts of FSC and PEFC Forest Certification in North and South America*: (SOFEW), 2009, Chapel Hill, North Carolina

On-site audits are conducted once per year. After getting certificate, company is eligible for FSC logo usage. Certification body approves every on – product and off – product logo usage.

FSC certificates are valid for five years. The FSC accredited certification body will conduct annual surveillance audits to verify compliance with FSC certification requirements.

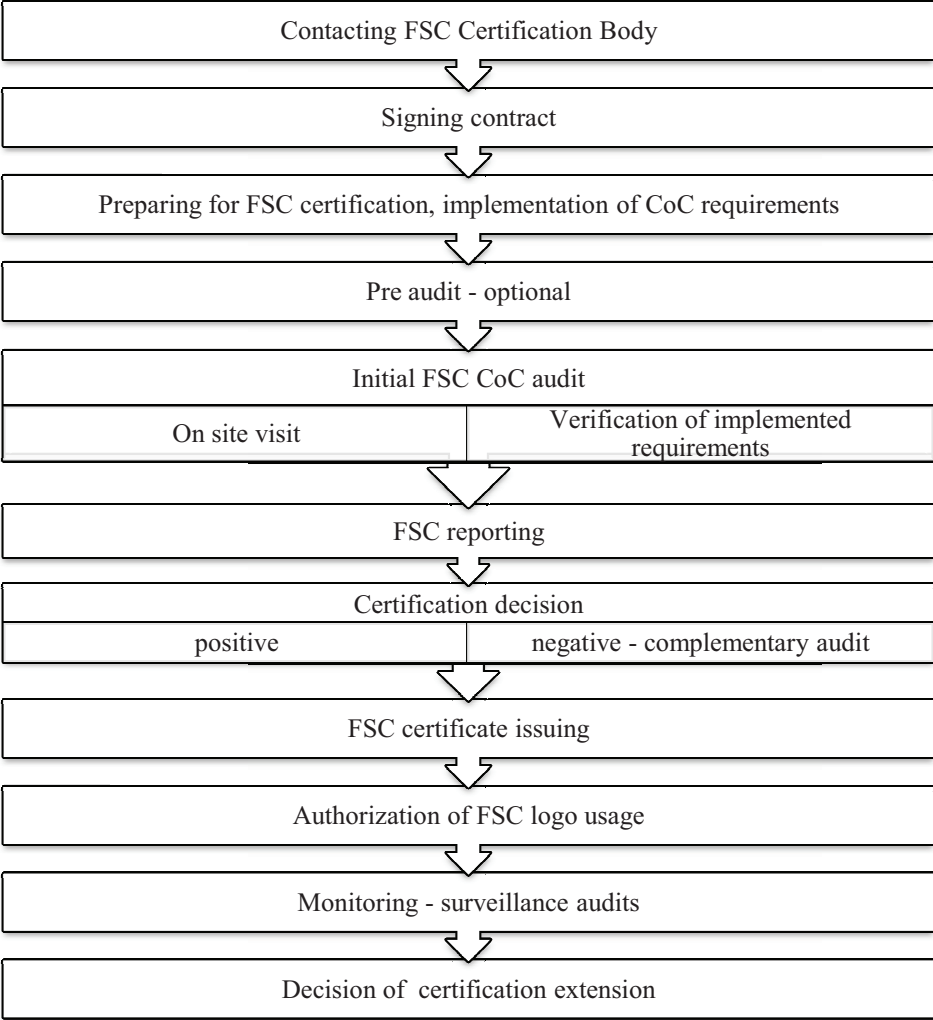


Figure 1 Certification process steps

### 3. Standard requirements

General standard for FSC CoC certification is FSC-STD-40-004 V2-1. This standard defines the basic elements of a Chain of Custody management system:

- Quality management: responsibilities, procedures and records;
- Product scope: definition of product groups and outsourcing arrangements;
- Material sourcing: material specifications;
- Material receipt and storage: identification and segregation;
- Production control: control of quantities and determination of FSC claims;
- Sales & delivery: invoicing and transport documentation;
- Labelling: application of FSC labels on-product and labelling thresholds.<sup>4</sup>

Chain of custody enables tracking particular forest product – log from forest of origin including every step from harvesting, processing, trading, storage to its final sale to the

consumer. Basic elements of CoC system are: information about quantities, critical point control and human resources management.<sup>3</sup>

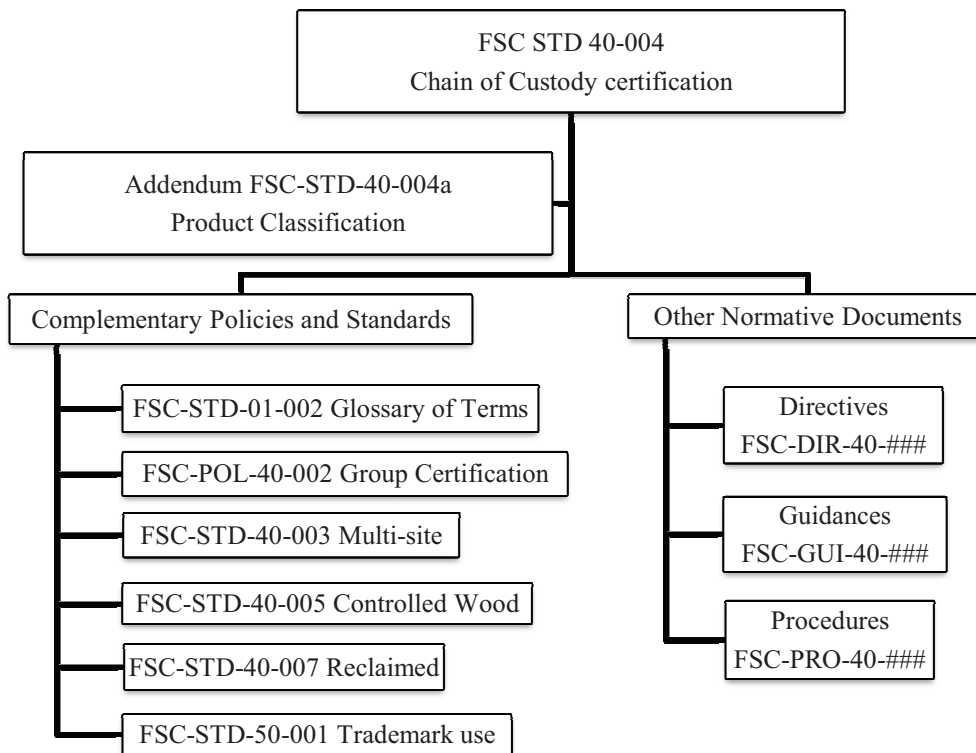


Figure 2 Policies, standards and directives (source: FSC-STD-40-004 V2-1)<sup>4</sup>

### 3.1. General requirements – quality management

**Responsibilities** - the organization shall appoint a management representative as having overall responsibility and authority for the organization’s compliance with all applicable requirements of this standard.

**Procedures** - the organization shall establish, implement and maintain procedures and/or work instructions covering all applicable requirements of this standard, according to its scale and complexity.

**Training** - the organization shall establish and implement a training plan according to the qualifications and/or training measures defined for each procedure.

**Records** - the organization shall maintain complete and up-to-date records covering all applicable requirements of general standard at least five years.

**Commitment to FSC Values** - the organization shall demonstrate its commitment to comply with the Values of FSC as defined in the “*Policy for the Association of Organizations with FSC*” (FSC-POL-01-004).<sup>5</sup>

**Occupational Health and Safety** - the organization shall demonstrate its commitment to occupational health and safety.

<sup>4</sup> FSC-STD-40-004 V2-1 Chain of Custody certification

<sup>5</sup> FSC-STD-40-004 V2-1 Chain of Custody certification

<sup>6</sup> FSC International Centre: *FSC Certification: Chain of Custody: a technical guide for manufacturers and suppliers*: 2010

Documented control regarding general requirements must be established and consist of:

- responsible person for CoC system and FSC logo usage appointment;
- training record and training plan;
- procures and/or work instructions for CoC system implementation;
- signed FSC-POL-01-004.<sup>6</sup>

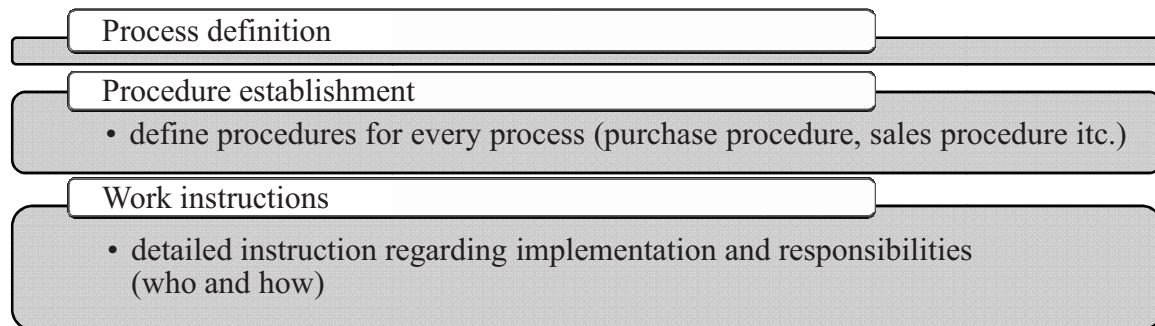


Figure 4. Connection between different levels of documents

### 3.2. Definition of scope of CoC system

The Organization must define product groups, scope of CoC system that will be produced and/or traded in accordance with FSC-STD-40-004a\_V2-0 FSC Product Classification. This standard is divided in three units: Wood Products, Pulp and Paper Products and Non-timber Forest Products (NTFPs). Product groups are divided into three levels, e.g. level W11: Wood for construction, level 2 – W11.5: Flooring, level 3 – W11.5.2: Parquet flooring and W11.5.3: Plank flooring.

Documentation for this requirement is FSC product group list and must have following information: product group specification (FSC 100%, FSC Mix, FSC Recycled or FSC Controlled Wood), product type(s) according to the FSC product classification and species including scientific and common names used as inputs to the product group.

### 3.3. Material sourcing, material receipt and storage

These requirements are in the first part, third and fourth clause of the standard FSC STD 40-004. It refers to material sourcing, supplier validation, purchase of non-certified material and material receipt and storage. Organization must keep record of FSC suppliers that includes supplied product type, supplied material category and supplier's FSC Chain of Custody or FSC Controlled Wood code. If controlled material is purchased requirements of „FSC-STD-40-005: Standard for Company Evaluation of FSC Controlled Wood“ must be applied. In case of purchasing non-certified reclaimed material, the organization shall comply with the provisions of “FSC-STD-40-007: FSC Standard for Sourcing Reclaimed Material for Use in FSC Product Groups or FSC-certified Projects”.<sup>7</sup>

When Organization is receiving certified products, invoices and transport or shipping documentation must be checked to ensure that supplied material is certified. Organization's CoC system must ensure that received certified inputs are identified, separated and clearly marked. Identification could be implemented through physical separation certified and non-certified production lines or temporal separation certified and non-certified production batches.<sup>5</sup>

<sup>7</sup> FSC standard for Chain of Custody certification FSC-STD-40-004 V2-1

### 3.4. Volume controls

Organization must specify conversion factor for each product group. Conversion factor is the ratio between material quantity entering and leaving a given transformation process employed by the organization. The conversion factor is calculated by dividing the output (volume or weight) by the input (volume or weight) and is applied to each individual component of a product group.<sup>7</sup>

Organization must keep records about quantities that confirm that inputs are compatible with outputs. That record is usually called material balances list in practice. Material balances list includes records for inputs and outputs: invoice references and quantities. Inputs need also include material category and, if applicable, percentage claim or credit claim and outputs FSC claim, information to identify the product item in invoices and applicable claim period or job order.

### 3.5. Sales and delivery documentation

Organization must ensure that all invoices and transport documentation include: description of the product, quantity of the products sold, the organization's FSC Chain of Custody or FSC Controlled Wood code and clear indication of the FSC claim for each product item or the total products.

## 4. Conclusion

Documentation for Chain of Custody certification must ensure that all key points are covered. General requirement is identification and separation of certified material. Through all stages of production must be possible to determine origin of material. Documented system shall enable tracking certified material through all stages from harvesting, processing and sale certified materials. Specific documentation along the whole chain of custody, including invoices, supplier accounts and record keeping are crucial to guarantee the traceability of all certified goods. Documented control must ensure Organization's compliance with all applicable and valid standards.

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# SUSTAINABILITY MODEL FOR WOOD PROCESSING INDUSTRY IN UNSTABLE BUSINESS ENVIRONMENT

*Artur Bobovnický*

## **Abstract:**

More than ever before, turbulent economic environment is looking for the answers to the question: why some companies are more successful than others. Why some companies are able to achieve sustainable growth over decades and why some stars are not able to cope with disruptive innovations and market changes? Our long term research shows some basic parameters which are influencing sustainable business development. Although the research has been done in the years preceeding the current unstable environment the model which has been developed is answering majority of questions managers are asking in these days. Wood processing industry is among those hardly hit by the world crisis. The IMP model has proved with specific project in Italy that is suitable for this sector and we draw recommendations based on this model for those who want to float over the hard times strengthened.

## **Key words:**

competitiveness, business model, success, strategy, differentiation

## **Introduction**

The reason why firms succeed or fail is perhaps the central question in strategy. It has preoccupied the strategy field since its inception five decades ago. It is inextricably bound up in questions such as why firms differ, how they behave, how they choose strategies, and how they are managed.

Any effort to understand success must rest on an underlying theory of the firm and an associated theory of strategy. While there has been considerable progress in developing frameworks that explain differing competitive success at any given point in time, any discussion of the determinants of firm success must begin with a clear definition of what success means. For purposes of this article, we will assume, in line with M.Porter<sup>1</sup>, that firm success is manifested in attaining a competitive position or series of competitive positions that lead to superior and sustainable financial performance. Competitive position is measured, in this context, relative to the world's best rivals.

To explain firm success, the early literature on strategy defined three essential conditions. The first is that a company develops and implements an internally consistent set of goals and functional policies that collectively defined its position in the market. Strategy is then seen as a way of integrating the activities of the diverse functional departments within a firm, including marketing, production, research and development, procurement, finance, and the like. The second condition for success is that this internally consistent set of goals and policies aligns the firm's strengths and weaknesses with the external (industry) opportunities and threats. Strategy is the act of aligning a company and its environment. That environment, as well as the firm's own capabilities, is subject to change. Thus, the task of strategy is to maintain a dynamic, not a static balance. The third condition for success is that a firm's

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<sup>1</sup> Porter, M.: On Competition. Harvard Business Press Books, 2008. ISBN-13: 978-1422126967

strategy be centrally concerned with the creation and exploitation of its so-called ‘distinctive competences’. These are the unique strengths a firm possesses, which are seen as central to competitive success. As a summary of this introduction, one can say that generic strategies are defined largely by their differences only in one dimension: the nature of competitive advantage sought.

## **Theoretical Framework for Developing Sustainable Strategy**

The future is often seen as a burden that we would only so gladly avoid under the pressure of the now. It is looked at as a date that will come regardless of what we do, or as a fleeting idea that loses its value in the next moment. So it comes as no surprise when managers retreat into the present. But the only companies that will emerge victorious are the ones that are able to recognize new patterns of success, package them in new business models and then bring them to light through strategic logic.

The first point is to generate a shared understanding why the traditional landmarks of strategic work (e.g. industry, products, functional excellence ...) lose their force – and what business logics contribute exactly to strategic management and leadership.

## **The competition of the future is a competition of business logic**

The results of the research<sup>2</sup> show that in coming years nearly all industries will experience dramatic downturns and that in 10 to 20 years only very few industries will still be functioning on the currently accepted fundamentals. Most managers have yet to focus sufficiently on this “inevitability” and have therefore not worked out any potential approaches to the coming changes. There is significant lack of forward thinking: 90 percent of managers choose not to reflect on and re-examine the future of their companies. Naturally, managers think about the future, but in 90 percent of the cases, the period with which they concern themselves includes only the next three to five years. At the same time, the questions they are trying to answer relate directly to their business and their competitors. An in-depth and systematic look at inter-industry developments or even at societal changes is seldom part of their “strategic” deliberations. Their thoughts of the future are a linear continuation of the past – nothing more and nothing less.

Over 80 percent of companies accept that successful strategy work requires a more in-depth look at the future. It is also obvious how difficult it is for companies to develop concrete visions of their own future, but 70 percent of companies lack a specific concept for building sustainable levels and types of expertise, therefore it is natural that 60 percent of companies doubt the sustainability of their own business logic. Differentiation is ultimately based on unique expertise and know-how within a company. A look at the future makes it clear that many companies do not possess a sustainable form of competence management. Only 35 percent of companies have a clear vision of their own potential to be different. Developing a unique, forward-thinking and coherent position in the market is a core element of successful strategy work. If a company is unclear about its potential for long-term differentiation, then no reasonable decisions can be made about product alignment, a system of adding value, sales and marketing, a revenue structure or innovation logic. Research results show that precisely this area is dramatically underdeveloped in the companies studied. 63 % of companies have no portfolio of innovation to ensure their uniqueness in the market.

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<sup>2</sup> IMP Expert Study. In preparation.

Uncertainties within companies regarding sustainable differentiation are also reflected in the value placed on product range sustainability. Only 40 % of companies are convinced by their long-term ability to add value. The backbone of any company is its ability to add value. Studies show that deficits in this area can seriously endanger a company's ability to compete over the long term, and 61 % of companies doubt the sustainability of their marketing logic. Marketing budgets have been on the rise in recent years for many companies, but many have realized that their successes in this area have been marginal at best. 70 % of companies cannot differentiate their own sales logic from the competition. Outstanding sales work takes on a particularly significant role in an increasingly difficult and overcrowded marketplace. Still, many companies have yet to set themselves apart in this area. In addition, great uncertainty prevails with regard to what makes a successful and sustainable sales structure. 53 % of companies run the risk of being unable to adjust their revenue models to the unique demands of the future. Looking at the figures, it becomes clear that many companies find themselves in unusually precarious positions. The market requires continuous quality improvements, but research shows that more than 80 percent of companies are not in a position to successfully raise their prices. In many cases, companies are being forced to drop their prices by a hefty 20 percent in order to compete. Looking more closely at the situation we see that many of these companies have not systematically adjusted their revenue models to reflect the changes of recent years. Overall, the research has shown that many companies find themselves in acutely precarious situations and that managers are finding it unusually difficult to align their companies for a sustainable future.

### **The Nature of Competitive Advantage – IMP Model.**

To find the way out of this situation IMP has carried out analysis of more than 2.100 companies from 10 nations which makes it clear that only very few organizations manage to achieve sustainable success<sup>3</sup>. Despite their differences, these companies all have one thing in common: they are able to continually create unique benefits in their markets. This unique quality is in turn the result of a specific ability to reinvent themselves from their core outwards and anticipate future trends in the market. Peter Brabeck-Letmathe, Chairman of Nestlé, speaking for all of the top performers who were analyzed in this project, sums up this central principle of sustainable success as follows: “It is not a matter of thinking about what made us successful up to now, but more importantly what we can do to be successful in the future.”

IMP has managed to clearly show the depth and interconnection of the central principles and elements of entrepreneurial success. As you can see, the set is describing the corporate success on 52%. Is it sufficient or not? 48% which are not described are factors like chance, intuition and last, but not least luck. So far, it is the most precise description with mathematical and statistical justification.

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<sup>3</sup> BAILOM, F. – MATZLER, K. – TSCHERNER, D.: Enduring Success. Palgrave MacMillan. New York, 2007. ISBN-13 978-0-230-55064-3

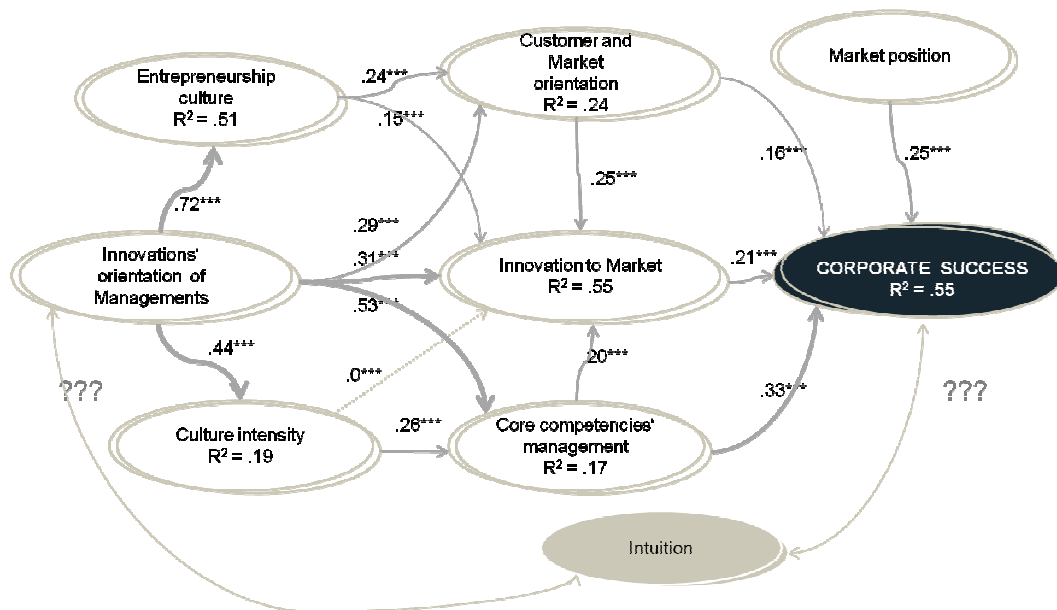


Fig. 1: IMP model of the nature of competitive advantage Source: Bailom et.al. <sup>3</sup>

The innovation orientation of the management is a key factor, closely followed by culture intensity and its type, core competence management and ability to bring the innovation to the market!

## Sources of Future Insights

Megatrends are the great forces in societal development that will very likely affect the future in all areas the next 10-15 years. Many companies and organizations use megatrends in their strategic work. Megatrends are great forces in societal development that will affect all areas - state, market and civil society - for many years to come. In megatrends such as, for example, prosperity and aging, lies a great deal of the knowledge we have about the future. We know that wealth will probably continue to increase by about 2% a year in the western world. We also know that there will be more elderly people and fewer youths in the near future. In other words, megatrends are our knowledge about the probable future. Megatrends are the forces that define our present and future worlds, and the interaction between them is as important as each individual megatrend. That is why futures researchers, companies and others use megatrends when they develop and work with scenarios. Megatrends can be a starting point for analyzing our world. Megatrends say something about the probable future, but there are other possible futures. Every megatrend can be set aside or can suddenly and fundamentally change direction. Wildcards - events that are unlikely, but that would have enormous consequences - can slow a megatrend's development or create counter-forces. For example, the events of September 11, 2001 temporarily stopped growth and slowed some aspects of globalization. Megatrends can be used as a methodology when you or your company works strategically with the future. You can, for example, use them as a base in development and innovation processes, and use them in combination with other trends in a more specific area. You can also use them if you create scenarios.

Many companies and organizations use megatrends in their strategic work with the future within all the central business areas, such as corporate strategy, market innovation, and business development, product development, marketing and HR. For implementation purposes the megatrends shaping with high probability our future, have to be transformed

into the lower level trends – macro trends industry focused and later onto industry focused micro trends.

## Case Study: Window and Doors Component Manufacturer, Italy

A leading producer of the components for doors and windows in Italy (Manufacturer) has approached us with the task to develop a long term strategy suitable to lead organization over the times of uncertainty and turbulences and help to gain new markets, grow the market share on key markets and inspire for new challenges. Our work has started with analysis of internal capabilities in term of IMP model during which several attributes have been identified which formed the basis for uniqueness of the Manufacturer. All relevant competitors and their approach to the market have been analyzed too.

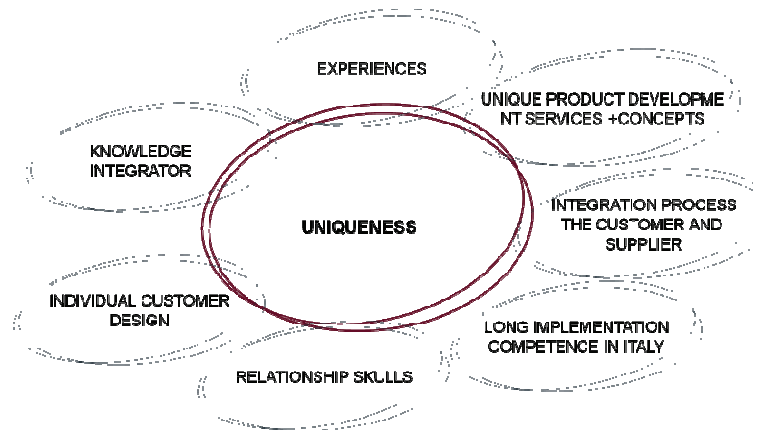


Fig.2: Analysis of uniqueness factors of Manufacturer. Source: IMP

The analysis then followed by thorough review of the forthcoming trends in construction industry in Italy. We went through the potential scenarios as seen on the following figure:

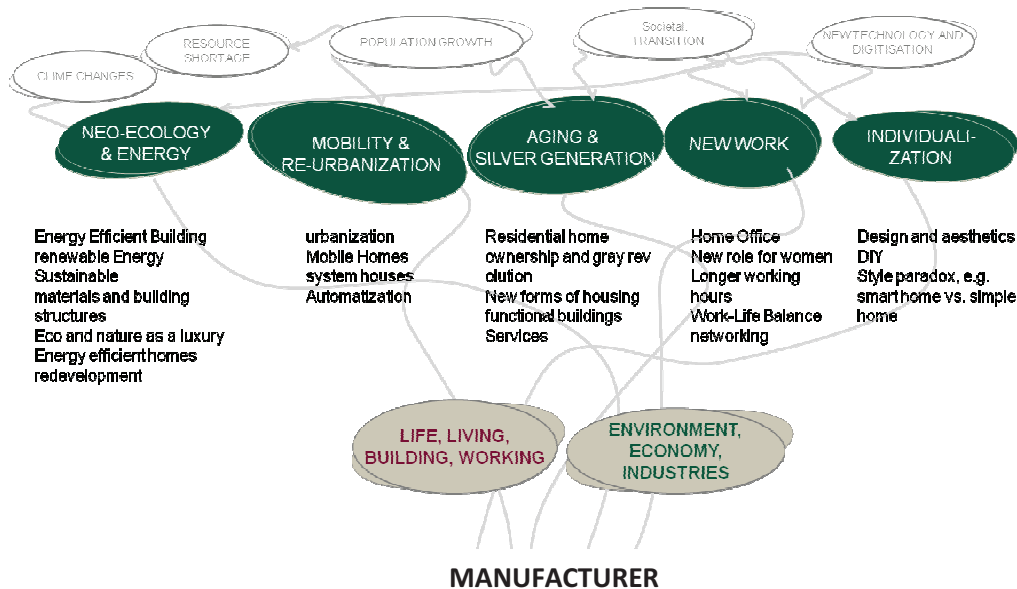


Fig.3: Megatrends and their implication for industry. Source: IMP internal documents.



This stage belonged to most difficult. Usually it is not very difficult to define uniqueness factors of a company; however it is much more difficult to identify, describe and justify the appropriate megatrends and their impact on the industry and then on the company. For this purpose in depth analysis of the Institute of Future have been used on the topic of the trends in construction industry, architecture, urbanization and social development.

This analysis has uncovered new situations and possibilities for Manufacturer on Italian market; we have forecasted that the whole industry will undergo a fierce competition which will end up with deep changes of the whole industry structure (Fig.4). Beside this rather expectable outcome, we have developed based on series of discussions and workshops with a Manufacturer a new positioning. This was based upon totally new competences which have been estimated as a needed for sustainable development of the company on changing and turbulent market. We have drawn the full road map needed to change from the system integrator to network integrator. That will require a change of the current business model from a system integrator version 1 with phased through system integrator ver.2 to network integrator as a required positioning for 2020 and further (Fig. 5).

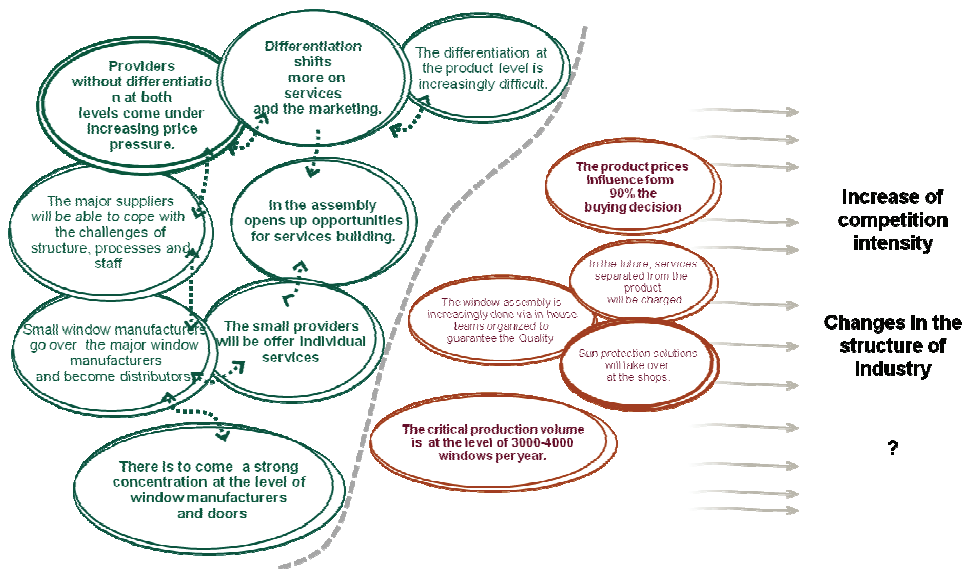


Fig. 4: Industry inner changes and development. Source: IMP internal documents.

As a network integrator we understand the entity capable to coordinate and integrate the series of rather independent professions and institutions – planner, architects, builders, window and door manufacturers, municipalities and public. This new role is needed based especially on the expected changes – requirements for new constructions, environmental requirements and shortage of energy supplies, legislative requirements regarding reconstructions and ownership structure.

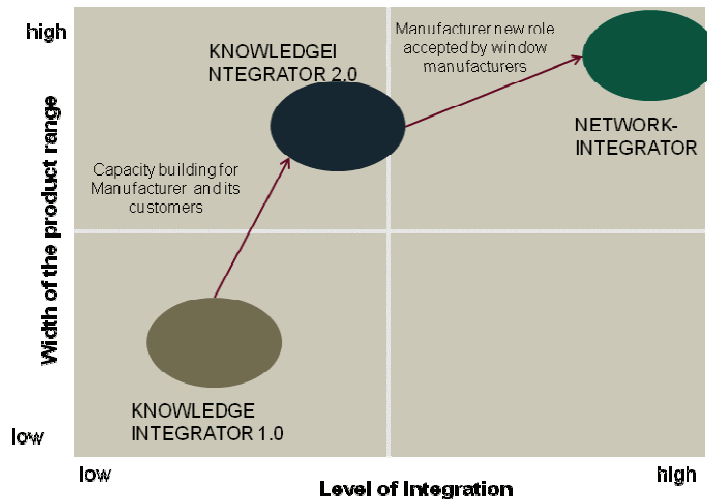


Fig. 5: The road map for Manufacturer positioning development. Source: IMP internal documents.

## Conclusion

This study demonstrates how it is possible to develop sustainable strategy which is based on thorough analysis of the highly probable scenarios for the particular industry and utilizing the data describing the environment (competitive scene), competitors (players), their power, strengths and weaknesses. We have demonstrated similar approach in our study for the Slovak tourist board in 2010, but in this case the analysis was even deeper and more detailed.

Economist Joseph Schumpeter discovered at the beginning of the 20th century that in order to generate value, a process of "creative destruction" must take place. Within that process lays the potential for innovation. This concept is not necessarily new. What is new is the increasing awareness that sustainability today depends more on the work we do to change a system than the work we do within a system. Despite this basic finding, many companies continue to focus their work on improvements and not on changes of an innovative or "creative destructive" nature. The case study presented herein shows creative destruction which is now undergoing within the Manufacturer and the approach how to develop basis for above mentioned creative destruction.

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# PROMOTION OF CROATIAN WOOD INDUSTRY BRANCH

*Denis Jelačić - Andreja Pirc Barčić - Vanja Čošić*

## **Abstract:**

Wood processing and furniture manufacturing is among the important industrial branches in Croatian industry. Its share in GDP is placing that industrial branch among those which should be part of the national strategy plans. But promotion of wood processing and furniture manufacturing in Croatia is far behind the promotion of other industrial branches. This paper will give the current situation in promotional activities of wood industry branch in Croatian media and it will present some ideas on improving that situation according to media share of other highly profiled industrial branches in Croatia.

## **Key words:**

wood processing and furniture manufacturing, promotion, media, media share, insertations

## **Introduction**

The Republic of Croatia is located in South East Europe with total area over 56 thousand km<sup>2</sup> and population of 4.5 mil people. In Croatia wood represents a significant raw material. The share of wood processing and furniture manufacturing in Croatian GDP was about 3 % in 2007. Domestic wood consumption in Croatia is over 3.4 mil m<sup>3</sup> annually and in the year 2007 the revenues were over 1 bil Euros with over 25 thousand employees<sup>1</sup>.

Industrial production indexes show significant decrease since 2007 until 2010. The same goes for wood processing and furniture manufacturing, since those are the first industrial branches which respond to any crisis, especially the global one. The main reason for that is the fact that wood processing and furniture manufacturing in Croatia are highly export oriented. So, any disturbances in global or European market have a significant influence on Croatian wood processing and furniture manufacturing<sup>2</sup>.

Situation in employment is almost the same. Total number of employees in wood processing and furniture manufacturing decrease from 25.000 in year 2007 (which was 9,8 % of all employees in industrial sector, and 1,67 % of all employees in Croatia) to 21.000 in year 2009 (9 % in industrial sector, i.e. 1,41 % of all employees)<sup>3</sup>.

Economic recession has strongly influenced the operation of companies in the last several years. We can notice its influence in all business fields, also in promotion activities of wood processing and furniture companies.

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<sup>1</sup> Motik, D., Jelačić, D. 1997. *The analysis of promotional activities in the furniture industry*. [In:] VII Interchair meeting of Organizers and Economists in Wood Industry, XII Economic Forum, State and development trends in wood industry, ISEODI '97, Stubičke Toplice, pgs. 93-98.

<sup>2</sup> Jelačić, D. 2011. *Motivation factors in times of normal business behavior and in times of economic crisis*. [In:] WoodEMA 2011 – Development trends in economic and management in wood processing and furniture manufacturing. International scientific conference. Kozina, Slovenia, pgs. 69-74.

<sup>3</sup> Šegotić, K., Motik, D., Moro, M., Ojurović, R., Pirc, A. 2008. *Analysis of business success of Croatian wood industry companies*. [In:] IUFRO Unit 4.05.00. International symposium, University of Ljubljana, Slovenia

## Research method

According to EFFIE index, in the world 400 billion USD per year is spent on advertizing and promotional activities. That amount is increasing each year by 5 % at least<sup>4</sup>. Large amount of that money is invested into advertizing and promotion activities on TV and printed media (newspapers, journals, magazines ...).

In Croatia most of the adverts are presented on TV, radio and in printed media, although other ways of promotion, such as billboards or brochures and flyers, cover significant share of market. At the moment the most successful promotions were those who cover several different ways of marketing, including social networks, such as Facebook.

This article will consider those promotion activities on TV and in printed media which were monitored by official agencies for monitoring the promotion covering in most exploited media in Croatia.

AGB Nielsen is an agency which monitors insertations of adverts on national TV channels (6 national TV channels) and Gross Rating Point (GRP) index on those same TV channels. Insertation is a number of emissions of particular advert on the TV channel, while GRP index is which can be expressed as follows:

$$\text{GRPs} = \text{Reach} \times \text{Frequency}$$

where *Reach* is the number or percent of different homes or persons exposed at least once to an advertising schedule over a specific period of time, and *Frequency* is the number of times that the average household or person is exposed to the schedule among those persons reached in the specific period of time. Because it is an average frequency, dispersion of frequency of exposure will differ between specific schedules and daypart mixes.

IPSOS is an agency which monitors adverts in printed media and on the radio. Since they just started to monitor radio stations, the data will cover only printed media. Given data will be presented in financial investment amounts to promotion in different printed media.

## Research results

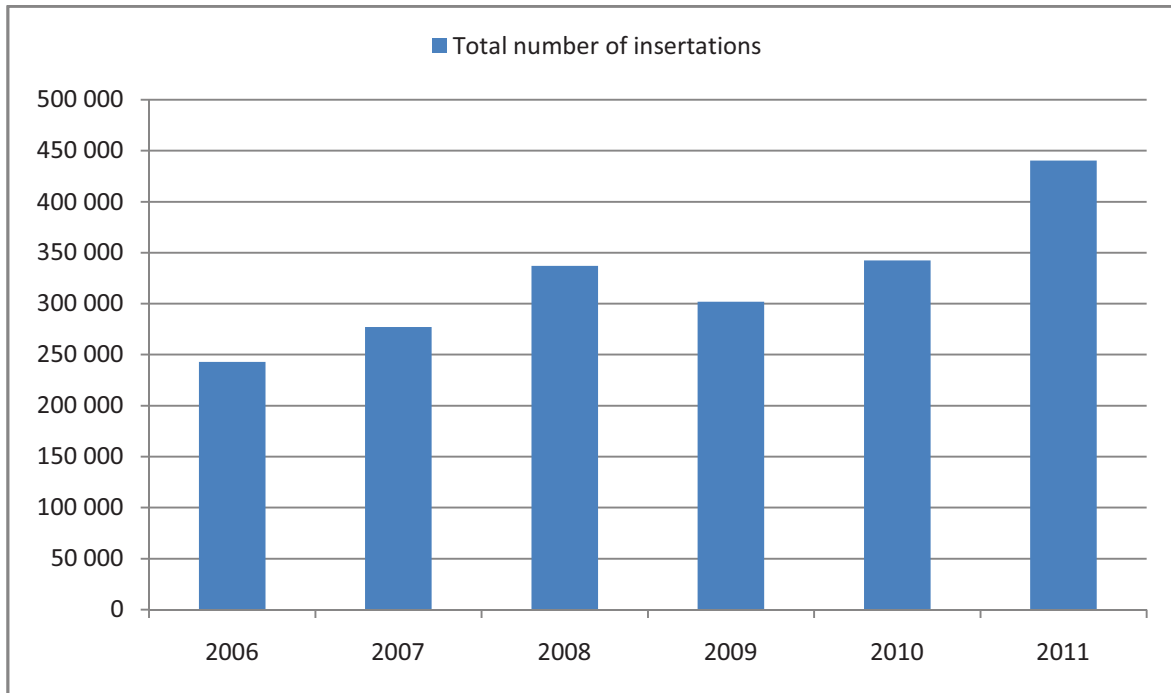
### Promotion activities on TV

Insertation is a number which shows how many times certain advert or group of adverts from a certain sector was broadcasted on a national TV channels. On the following figure the total numbers of insertations for the period 2006-2011 is presented (figure 1). The following figures show the share of several most TV exposed sectors and sector of furniture, household appliances and accessories (figure 2), and then furniture in particular (figure 3). As it can be seen, wood processing and furniture manufacturing covers very, very small share of promotion activities on the national TV channels.

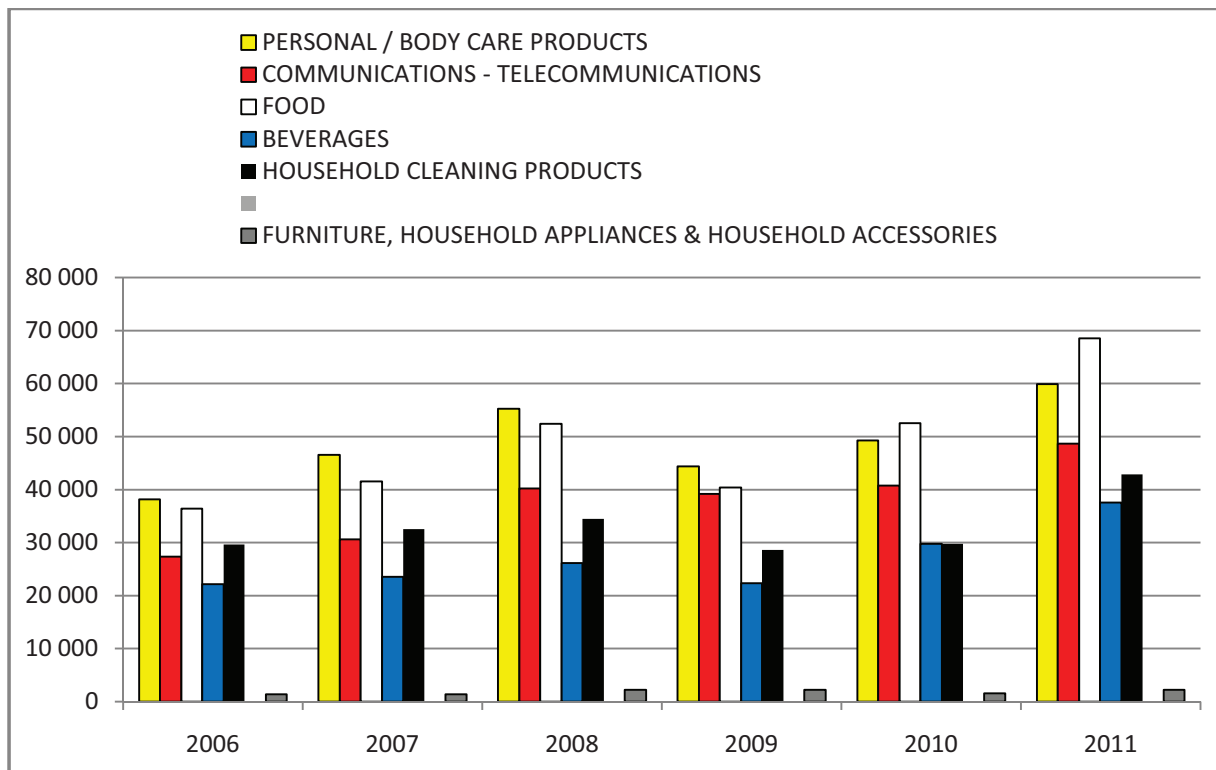
If we look at the GPR indexes the situation is similar to insertation numbers for particular sector as well as for particular elements in furniture, household appliances and household accessories. Figure 4 shows the GPR indexes for particular sectors monitored by AGB Nielsen agency.

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<sup>4</sup> Žujo, M. 2011. *Ključ za uspjeh reklame je Facebook*. [In:] Poslovni dnevnik, Večernji list, Zagreb, Croatia, pgs. 24-25.

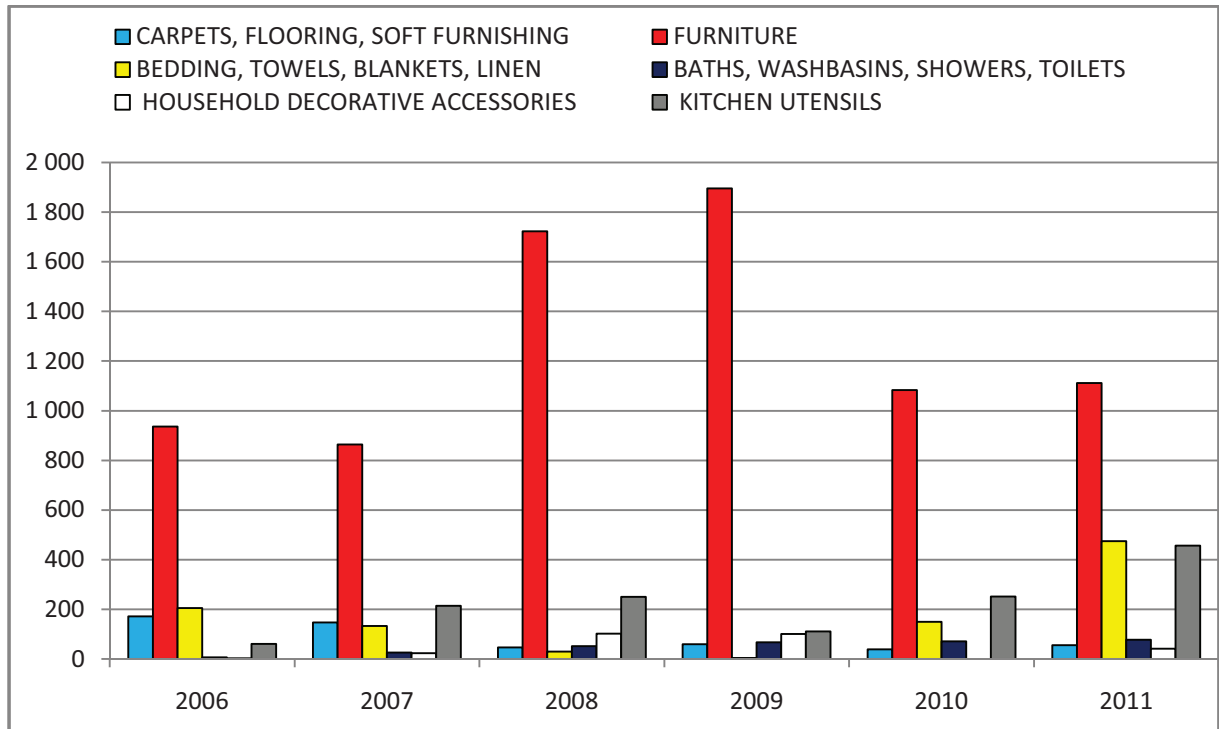


**Fig. 1. Total number of insertations for period 2006-2011**  
Source: AGB Nielsen

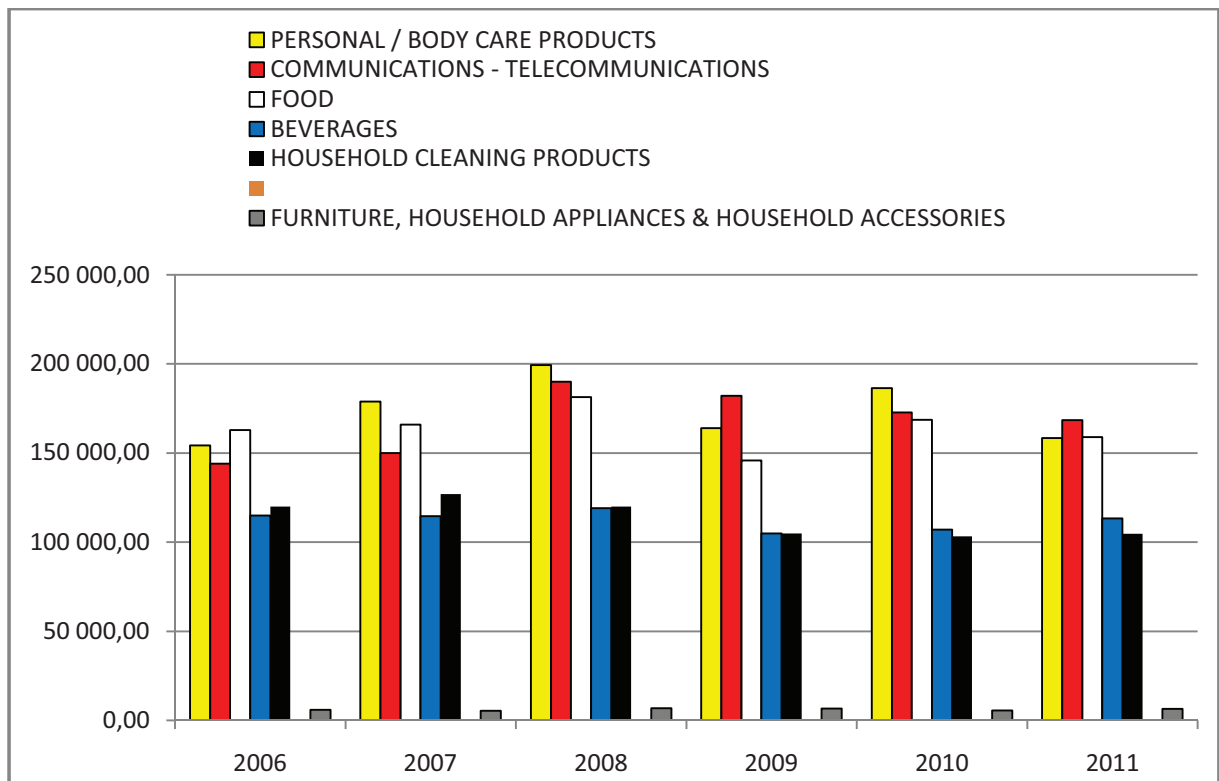


**Fig. 2. Number of insertations of particular sectors in 2006-2011**  
Source: AGB Nielsen





**Fig. 3. Number of insertations for furniture in period 2006-2011**  
Source: AGB Nielsen

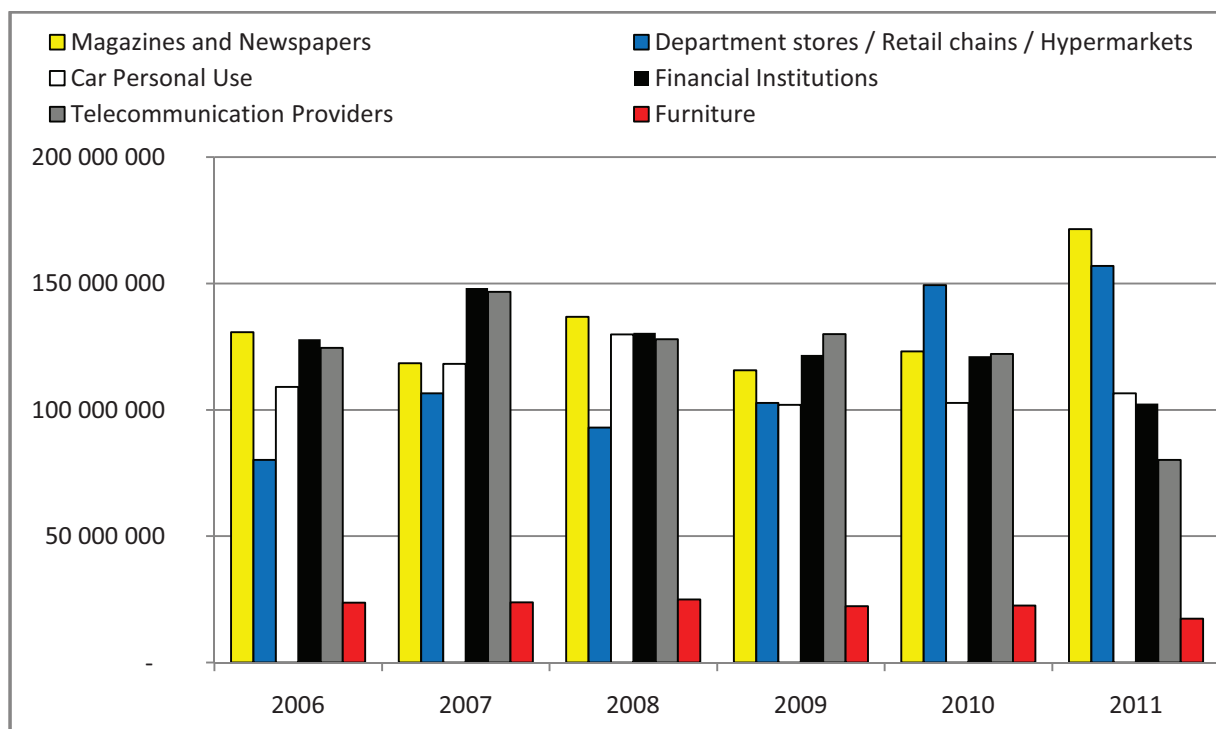


**Fig. 4. GRP indexes for sectors in period 2006-2011**  
Source: AGB Nielsen

## Promotion activities in printed media

IPSOS is monitoring the printed media promotion activities but not as number of adverts in all Croatian printed media, but as an amount of money invested in printed media for advertizing according to valuable price list in particular newspaper or journal.

Advertising is not monitored by sectors, as on TV, but according to group of products or production programs. Therefore the data for printed media is different than data for TV, but never the less the state of promotion activities of wood processing and furniture manufacturing branch in Croatia can be observed. Following figure 5 shows the share of financial assets invested to promotion in printed media by wood processing and furniture manufacturing and other branches.



**Fig. 5. Investments to promotion in printed media by products**

Source: IPSOS

As it can be observed from the figure 5, the share of wood processing and furniture manufacturing in the total investment to promotion in printed media is much higher than share of promotion on TV channels. For example, the share of promotion space on TV channels in the year 2011 (the smallest) was only 0,252 % for furniture, i.e. 0,503 for sector of furniture, household appliances and household accessories. The same share of promotion space on TV channels in the year 2009 (the highest) was 0,628 % for furniture and 0,741 % for the whole sector. In the same time, share of furniture adverts in printed media in the year 2011 (the smallest) was 1,129 % and for the whole sector it was 1,765 %, which is much higher than on TV. The highest share furniture had in the year 2006 and it was 1,803 %, and that share for the whole wood processing and furniture manufacturing sector it was 2,825 %.

Total amount of investments to promotion in printed media for the year 2006 was 1.315.215.437 HRK (cca. 179.062.687 €) and it was the smallest amount. In the year 2008 it was the highest and investments in promotion in printed media was 1.566.207.499 HRK (cca. 213.845.917 €).

## Conclusion

It is obvious that the industrial branch such as wood processing and furniture manufacturing deserves a better place in the promotion business of Croatia. Especially on TV channels, since there is a saying “if it is not on TV, it doesn’t exist”.

The main problem for promotion of wood products in Croatian media is lack of working capital, so wood processing and furniture manufacturing companies decide to invest it into something else instead of promotion activities. Second reason is lack of lobby which would promote wood processing and furniture manufacturing as an environmentally friendly industry. Wooden clusters could and should improve that by making joined actions in that direction. The battle between wooden clusters and PVC lobby regarding joinery (windows especially) is very hard and PVC is winning at the time. But that should be changed fast and soon. One more way to improve it is for companies to get together in cluster based on production program and not regionally, so they could act together in promotion activities. Especially, it would be good toward promotion on TV, since it is much more expensive than promotion in printed media.

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# USE OF ELEMENTS OF THE MARKETING COMMUNICATIONS MIX IN SLOVENIAN FURNITURE COMPANIES

*Matej Jošt – Leon Oblak – Anton Zupančič – Jure Kos*

## **Abstract:**

In this study we used the survey to evaluate, which components of marketing communications (promotional) mix the Slovenian furniture companies use in marketing of their products. From the results it appears that medium companies devote more resources to marketing communication and they mainly use two components of marketing communications mix - advertising and sales promotion. For marketing communication micro and small companies often choose personal selling and/or direct and electronic marketing.

## **Key words:**

Slovenia, furniture companies, marketing, marketing communications mix, survey

## 1 Introduction

Effective marketing communication is a critical factor in the success of the company's marketing strategy. Marketing communications includes all communication activities to inform and persuade the company customers in the target market about their products and services. That leads to facilitate the direct exchange of goods in the market.<sup>1</sup>

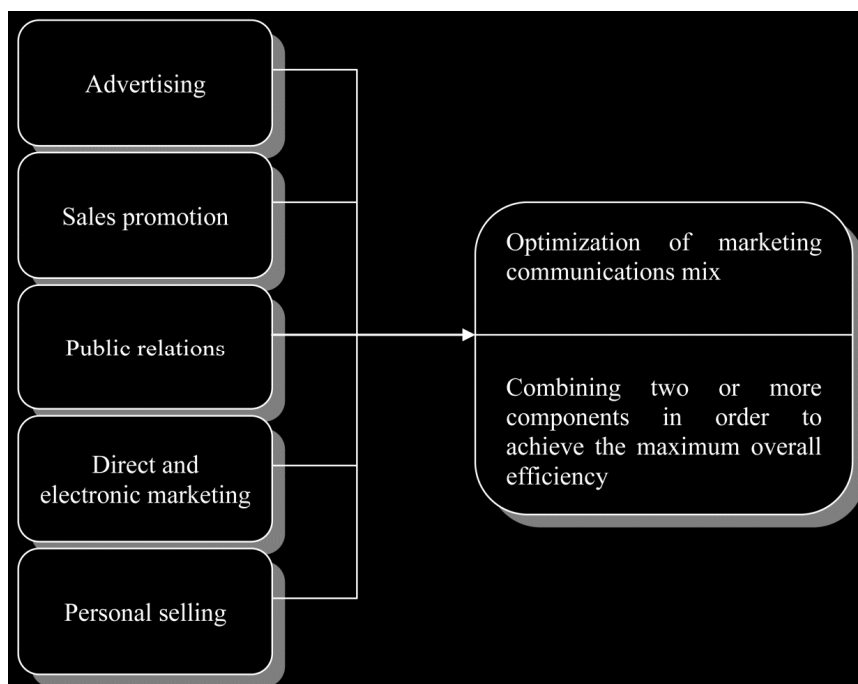


Figure 1 Components of marketing communications mix<sup>2</sup>

<sup>1</sup> HABJANIČ, D., UŠAJ, T.: Osnove trženja. Ljubljana : J & S Aladin, 1998. 129 pp. ISBN: 961-90643-0-5

<sup>2</sup> POTOČNIK, V.: Temelji trženja : s primeri iz prakse. Ljubljana : GV založba. 2005. 531 pp. ISBN: 86-7061-374-3

Marketing communication is crucial in creating awareness of the existence of products or services, creating a positive image about the brand and to promote the distribution. It also plays an important role in business to business communication. Between competing products and their prices there are no longer significant differences, therefore to make a product specific companies use: advertising, offers additional services and personal selling. The purpose of marketing communications is to create awareness and build a positive image of company as a whole, to improve understanding of the scope of company and to overcome bad attitudes towards company. This leads to sales success.<sup>3</sup>

In communicating with individuals, groups and other organizations the companies use different methods of communication. Marketing communications mix consists of five components: advertising, sales promotion, public relations, direct and electronic marketing and personal selling.<sup>4</sup> To achieve the maximum overall efficiency companies can use any communication activity itself or in combination of two or more components.<sup>5</sup>

## 2 Results

In our study we used a questionnaire. For the respondents we selected Slovenian companies which are engaged in the manufacture of furniture. We sent the survey via e-mail and fax. At some companies perform survey by personal call on the phone. 96 furniture companies has responded to our survey: 76% of micro companies (companies employing less than 10 persons and whose annual turnover or total assets not exceeding 2 million €), 15% of small companies (companies with 10 to 50 employees and whose annual turnover not exceeding 8,8 million € or total assets not exceeding 4,4 million €) and 9% of medium companies (companies employing 50 to 250 people and an annual turnover not exceeding 35 million € or total assets does not exceed 17,5 million €).

We wanted to know what kind of components of marketing communications mix the companies use. The results are shown in Figure 2.

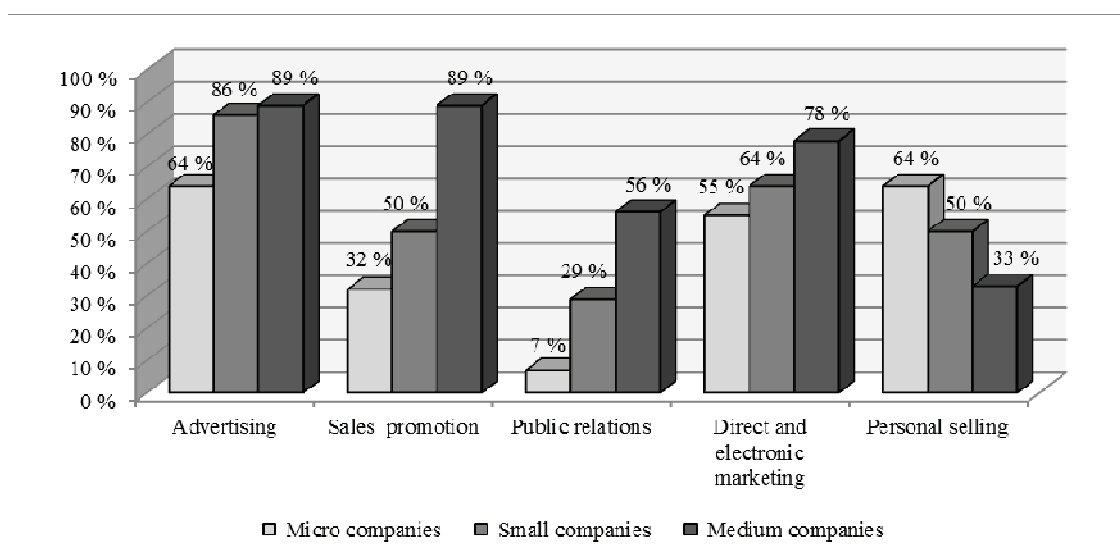


Figure 2 The use of marketing communications mix in Slovenian furniture companies

<sup>3</sup> STARMAN, D.: Tržno komuniciranje. Ljubljana : Ekonomska fakulteta: 1996. 87 pp.

<sup>4</sup> POTOČNIK, V.: Temelji trženja : s primeri iz prakse. Ljubljana : GV založba. 2005. 531 pp. ISBN: 86-7061-374-3

<sup>5</sup> KOTLER, P.: Marketing management - trženjsko upravljanje : analiza, načrtovanje, izvajanje in nadzor. Ljubljana : Slovenska knjiga, 1996. 832 pp. ISBN: 961-210-043-8

70% respondent companies use advertising: 64% of all micro companies, 86% small companies and 89% medium companies (figure 2). It should be noted that micro companies most often choose the cheapest medium for the advertising (print ads, posters, brochures, billboard, mobile billboard, local newspapers, local radio stations, online etc). Small companies as the most common advertising medium selected online (www) advertising (29%), followed by newspapers (23%). Medium companies put more attention to advertising in selected magazines (25%), newspapers (21%), followed by radio stations (15%) and rarely television ads (1%).

Sales promotion use only 40% of all companies. Just 32% of the all surveyed micro companies used sales promotion, it is because they do not produce in advance (stock) but they produce for final customer. 50% of small companies and 89% of medium companies used sales promotion. Larger companies create higher stocks and many of them has been cooperating with furniture retailer companies. They used the sales promotion in order to reduce stocks and increase cash flow. For sales promotion surveyed micro companies mostly choose lower prices (47%), followed by gifts (19%) and samples (14%). Small companies also often use the lower prices (44%), followed by gifts (22%) and free trials of products or services (11%). Similar to micro and small companies, medium companies for the sales promotion mostly choose lower prices (37%), followed by gifts (16%), samples (11%) and awards (11%).

Only 7% of micro companies have a part of public relations, small companies that used this component of marketing communications mix in 29%, while medium companies used it as much as 56%. The share at medium companies is higher since the micro and small companies usually does not have personnel who would deals with public relations, in addition, they usually cannot afford the cooperation with advertising agencies. Most surveyed companies as a way of public relations use donations (14%), followed by sponsorship of sporting events (13%) and sponsorship of cultural events (12%).

The results of survey show that 58% of included companies used direct marketing in the process of marketing communication: 55% of all micro companies, 64% of all small and 78% of all medium companies. The most commonly used forms of direct marketing are: phone, e-mail, mail and catalogue.

Personal selling is used by 59% of surveyed companies: 64% micro, 50% small and only 33% of medium companies. The reason, that share at micro companies in personal sales is greater than at small and medium companies, is certainly in the fact that micro companies are more focused to direct contact with the market (to the end costumer). Companies use personal selling primarily in three situations:

- selling a custom made, expensive and complex products,
- continuation of written or telephone communication or
- selling to customers who buy large quantities.

### **3 Discussion and conclusions**

In the study the marketing communication in the Slovenian furniture companies was analysed. We wanted to get the information what kind of components of marketing communications mix the companies use. The results revile the situation in the field of marketing in the Slovenian furniture sector. We found out that small businesses are still too little aware of the importance of marketing communication. Nowadays it is much more supply



than demand on the market, so the entrepreneur has to deal with the marketing communication to improve his results.<sup>6</sup>

From the results obtained in the study we found out that more than one third of micro companies do not advertise, even the advertising is surely is one of the most important component of marketing communications mix. The result for small and medium companies was slightly better. The reason that micro companies do not advertise are certainly small financial resources and belief that they have a permanent costumers. Among the possible forms of marketing communication an online advertising is the most often used by the companies.

A similar result is with sales promotions, where only a third of micro companies uses this form of marketing communication, while almost half of small companies used it. Medium companies are obviously well aware of how important it is to promote the sale of products, since the acceleration of sales is due to pressure of competitors and the current situation in the market very important component of marketing communications mix. In addition, medium furniture companies produce more final products for the stock compared with small companies. These stocks should be sold as quickly as possible, because they present expenses for the company, so they use the sales promotions. For sales promotions the most common used tools by the furniture companies are lower prices of products and gifts.

The medium companies are clearly the most aware of importance of public relations. The most common used forms of public relations at furniture companies are donations to various institutions or societies and sponsoring various events.

Similar to advertising the direct marketing is the most commonly used in medium furniture companies. The most popular is the electronic marketing, which is becoming increasingly popular and has many advantages over other direct marketing tools.

In the field of personal selling we can conclude that the use of this component reduces with the size of the company. Only 33% of surveyed medium companies are engaged in a personal selling, while the share at small companies is 50% and at micro companies 64%. Small companies have certain advantages in the field of personal selling as they can easier achieve direct contact with the customer and they are more flexible to fulfil the customer needs. Because of that they are more connected to their buyers.

#### **4 Summary**

In the current situation companies which want to be successful has to know and satisfy their target customers. Their offer has to be better from competitors. Companies use many different ways to communicate with the market and combine them in a mixture. The marketing communications mix includes: advertising, sales promotion, public relations, direct marketing and personal selling. With an optimal combination of those components the companies: presents their products, creates a positive image about their brand in public and gains new users of their products or services.

The results of the study shows that micro and small companies promote their products less than medium companies, primarily due to a lack of knowledge and small funds, so they primarily decide for advertising on websites, which is more affordable. Unlike the micro and

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<sup>6</sup> KOS, J.: Uporaba sestavin tržnocomunikacijskega spleta v slovenskih pohištvenih podjetjih. Undergraduate thesis. Ljubljana : Biotehniška fakulteta, 2011. 62 pp.

small companies the medium companies often choose the more expensive forms of marketing communication such as advertising, which is considered the most successful component of the marketing communications mix.

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# DEVELOPMENT OF COMPETENCY MODEL FOR WOOD INDUSTRY

*Jože Kropivšek - Leon Oblak - Petra Grošelj - Anton Zupančič*

## **Abstract:**

Globalization of business environment and general technological progress and development increase the demand for new knowledge and wider competences of employees. Companies can provide some of this knowledge by employing young, highly educated workforce. For the rest, they have to provide trainings and/or additional education for existing employees. The educational structure of employees in Slovenian wood-industry companies has slightly improved in last years, but it is still poor and relatively unfavorable for adaptation to new business requirements. The main goals of the research was to figure out which knowledge/skills are missing the most in Slovenian wood companies and to determine how companies treat various forms of education. Final objective of the research was to formulate the competency model for some work areas, as basis for possible configuration individual/collective programs of lifelong education/training of employees in wood industry.

## **Key words:**

competency model, knowledge catalog, lifelong education, wood industry

## **1. Introduction**

According to Lundvall, success of any individual, company or society as a whole, is provided by accessing new knowledge, as it is providing opportunities for acquiring new skills while also gaining new competences. Learning and training are activities that are needed at all stages of life, all levels of society and the economy, regardless of its technological development.<sup>1</sup> This also applies to the Slovenian wood industry, which belongs to the labour-intensive industries. Globalization of business environment and general technological progress and development are the cause of many (even very dramatic) changes within the past few years, which can present great obstacles for companies' existence, or on the other hand, great opportunities and possibilities for growth and development.<sup>2</sup> Demands for new skills are increasing by tracing the development, exploitation of business opportunities and increasing the operating efficiency of enterprises. Since the new value in companies is generated by employees, numerous authors realize that next to people's efficiency, also their creativity is becoming more and more important.<sup>3, 4</sup>

Knowledge is often not sufficient for successfully working, so companies are increasingly introduce competency models. Competences are defined as a set of knowledge, skills, abilities, aptitudes, personal suitability behavior and impact on performance at work.<sup>5, 6</sup> It is

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<sup>1</sup> LUNDVALL, B. A.: *The Globalising learning economy: Implications for innovation policy*. [online]. Luxembourg : Office for Official Publications of the European Communities, 1997. [cited 2012-04-02]. Available from: <ftp://ftp.cordis.lu/pub/tser/docs/globeco.doc>.

<sup>2</sup> DEKLEVA, S.: Globalizacija: ovire in prednosti. *Uporabna informatika*, 1999, Vol. 7, No. 2, 5-13 pp.

<sup>3</sup> PUČKO, D.: Ravnateljstvo znanja.- Zbornik referatov: *Analiziranje za potrebe strateškega odločanja ter dosežki analitske prakse in teorije*, Bernardin 24. – 25. september 1998. Ljubljana : Zveza ekonomistov Slovenije, Sekcija za poslovne analize, 1998, 53-69 pp.

<sup>4</sup> MIHELČIČ, M.: *Poslovne funkcije*. Ljubljana : Založba FE in FRI, 2008. 390 pp.

<sup>5</sup> SANGHI, S.: *The Handbook of Competency Mapping: Understanding, Designing and Implementing Competency Models in Organizations*. First Edition. SAGE Publications Pvt. Ltd, 2004. 142 pp.

very important how the competences are reflected in the behavior of people when they are faced with different tasks in different situations and circumstances. Competences, in substance, are divided into general and specific. While the general competences include skills and abilities that are important for the effective and efficient performance of the work, the specific competences are linked to its contents. The latter are, in practice, often supported by so-called knowledge catalogs, where technical and other skills, which are important to successfully working on the specific areas, are precisely defined. Competences are normally shown in competency model, what is a detailed, behaviorally specific description of the skills and traits that employees need to be effective in a job.<sup>7</sup>

As in other sectors, the wood industry companies are also experiencing the problem of lack of certain skills and competences, mainly due to two reasons: (1) due to inadequate qualification structure of employees and (2) due to out-of-date knowledge that is the result of rapid development and innovations on the specific areas of work (e. g. in the field of technology, materials, management, etc.). Certain part of this knowledge companies can gain by hiring of young, highly educated staff, while the rest must be provided by training and/or educating of existing employees.

The educational structure of employees in Slovenian wood-industry companies has improved in last years, mostly due to a larger share of employees with higher education, but still, almost half of the employees have an unfinished/finished primary school or lower vocational school. That makes educational structure in Slovenian wood-industry companies still relatively unfavorable for adaptation to new business requirements.<sup>8</sup> For additional education/training of employees, companies most often look for external education providers. Offer of education is often very inflexible, both in content and execution, so the choice for company is much harder. In most cases, the physical presence of trainees is required, which imposes costs due to absence of staff and travel costs. At the same time, inflexibility in the coordination of terms of education and the obligations of employees in the work and business process of companies is also present.

We have assumed that there is a difference between the importance of the knowledge for qualitative performance of tasks and the current level of knowledge in wood companies. In the research we first determine the statistical significance of these differences in general and expose knowledge where the biggest lack of knowledge and competences for working on different fields of work were found. We also checked the companies' attitude to the various forms of education (traditional education, distance learning, blended learning) and this was compared with an offer of lifelong learning in Slovenia. The ultimate aim of research was to develop a model/matrix of knowledge and competences for individual work areas, on which it is possible to create individual/group training and education programs in enterprises.

## 2. Working method

The research was made in consecutive separated stages. In the first stage the available data from previous years was checked. In the second stage the analysis of the situation was made, which was implemented in Slovenian wood-industry companies, and where the method of classic questionnaire with closed type of questions was used. Dichotomous questions,

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<sup>6</sup> SVETLIK, I.: O kompetencah. In: Pezdirc, M. S. (ed.), *Kompetence v kadrovski praksi*. Ljubljana : GV Izobraževanje, 2005. 165 pp.

<sup>7</sup> MANSFIELD, R. S.: Building Competency Models: Approaches for HR Professionals. *Human Resource Management*, 1996, Vol. 35, No. 1, 7-18 pp.

<sup>8</sup> KROPIVŠEK, J. et al.: *Prenos inovativnih praks vseživljenjskega učenja odraslih v slovenski lesnopredelovalni sektor : analiza stanja = Transfer of innovative practices in the vocational education and training to Slovenian wood sector*. Ljubljana : Oddelek za lesarstvo, 2009.

questions with multiple possible answers, questions with the grading scale and questions with ranking by importance were used. The questionnaire was composed of two parts: (A) questionnaire for the assessment of qualification structure and most appropriate form of trainings/education performance which were fulfilled by human resource managers or corporate executives, and (B) a questionnaire for determination of the level of knowledge to perform tasks which were fulfilled by employees with ISCED 3 or a higher level of education.

Both questionnaires were sent along with the instructions to 129 companies, members of the Slovenian Chamber of Commerce. There were 15 A and 145 B questionnaires returned. The research covered almost 17% of population employed in Slovenian wood industry (3210 employees) at questionnaire A. By questionnaire B about 10% of the population in studied companies was covered.

To determine the significance of differences between importance and the current level of knowledge, the Wilcoxon signed-rank test, which is a nonparametric test for paired data, was used.

### 3. Results

There is a bit more than 44 % of employees in researched wood industry companies with less than vocational education. Mainly there are learned workers with complete or incomplete primary education. Around a quarter of employees have vocational education (mainly carpenter), almost a fifth is technically educated staff. Tertiary education has a little less than 10 % of employees. The educational structure has improved in the recent years (compare Kropivšek et al, 2009<sup>9</sup>), but is still poor, especially in production. The result is a difficult transition to the production of products with higher added value, which is crucial for long-term success of the branch.

The majority (87%) of those responsible in the company believes that the education and training of employees is (very) important, only 13% of them consider that it is not important. This result is very encouraging for the enterprises development, but it also means the necessity of installing an appropriate system of additional education and training in the wood industry branch.

Less than half (47 %) of surveyed companies have an annual plan of education and training at the enterprise level, even fewer companies (only 27 %) have accurate annual education and training plans for individual employees or groups of employees, what reflects the uncontrolled and unplanned work in this area.

In the analysis dealing with the importance of knowledge to perform the tasks and the current level of knowledge in specific work areas, the following were determined:

- In the management area, some large differences, between the current level of knowledge and the importance of knowledge to perform those tasks, were assigned to specific tasks. These tasks are primarily "use of financial reports", "product development" and "participation in informatisation of business". As the most important, tasks in the field of management and strategic/tactical planning were assessed, for which, however, the current level of knowledge was quite high.
- In the supply area, conditions are literally critical for certain tasks, while for others may be acceptable. The biggest differences between the current level of knowledge and the importance of knowledge for these tasks were at "project management" and "participation in informatisation of business".

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<sup>9</sup> KROPIVŠEK, J. et al.: Qualification structure in Slovenian wood industry companies. In: Bičanić, K. (ed.). *Competitiveness of wood processing and furniture manufacturing - proceedings*. Zagreb : WOODEMA, i.a., 2009. 149-154 pp.



- According to the respondents, the knowledge at sales area is satisfactory and comparable to the importance of this knowledge. The largest deviations were at tasks assigned to "strategic and tactical planning", "product development", "monitoring of legislation" and "communication in foreign language". A "company/group management" and "marketing of products" were also highlighted.
- In the production preparation area, the biggest differences between the current level of knowledge and the importance of knowledge to perform tasks in this field were determined at activities "strategic and tactical planning", "study of work and working time", "monitoring of legislation" and "communication in foreign language", while at the task "preparing the operational and technological documentation", which was rated as the most important, the current level of knowledge is relatively high.
- In the production area there are practically no tasks for which it could be argued that the current level of knowledge of employees diverges significantly from what would be considered to be the necessary knowledge to successfully perform the tasks. The biggest differences were at tasks associated with team and projects management, tracking news in technology and materials development, and at participation in informatisation of business.
- In finance, there were relatively few tasks estimated as important. Among them there were the most important "monitoring of legislation" and "use of financial reports", which were found to have a relatively high level of current knowledge.
- In the development area, the situation is satisfactory at most of the tasks. The largest differences between the current level of knowledge and the importance of knowledge to perform these tasks, were at "product marketing", "project management", "monitoring novelties in materials development" and at "monitoring of legislation".

Wilcoxon signed-rank test showed that the difference between the importance of knowledge and current level of knowledge (Table 1) is statistically significant ( $z = 77.3$ ,  $p = 0.0000$ ). For all areas and all tasks the average difference between the importance of knowledge and current level of knowledge is 0.63.

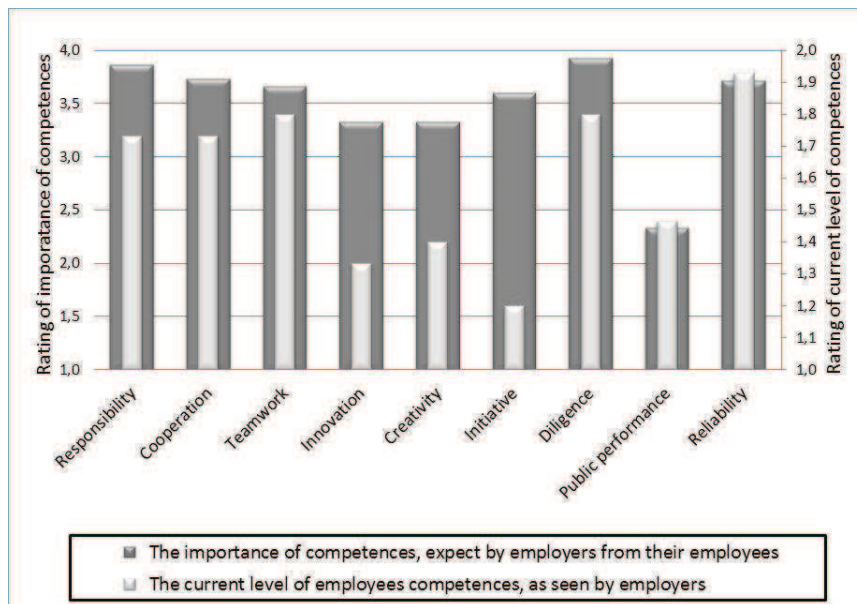
Table 1: Wilcoxon signed-rank test of differences between the importance of knowledge and the current level of knowledge at specific work areas.

Area	The average difference
Management	0,72
Supply	0,72
Sale	0,72
Production preparation	0,61
Production	0,49
Finance	1,27
Development	0,34
<b>Total average</b>	<b>0,63</b>

Among general competences, employers expect particularly diligence and responsibility of their employees, as they estimate the importance of them with average rating of 3.93 and 3.87 (Fig. 1). For the slightly less important were estimated participation (3.73), reliability (3.71) and teamwork (3.67). Among them, the best estimated in term of the presence, is reliability (1.92), while the current situation at innovation, creativity and initiative is unsatisfactory.

Based on this analysis, a model/matrix of key knowledge and specific competences for each work area were formed (Table 2). Within each group of the key knowledge,

competencies have been developed for different work areas. Some of them are very specific and important only for specific areas of work, while some are important for all areas of work.



Legend of relevance: irrelevant (1); little importance (2) important (3) very important (4)  
 Legend of the current situation: unsatisfactory (1), satisfactory (2)

Figure 1: The importance of general competences and current state of key competences of employees as they are seen by employers

Majority of surveyed companies believes that traditional lecture in the classroom is the most appropriate form of education, especially the possibility of training in the company's premises (59%) or in rented premises for the period of education for their employees (21%). This reflects the company's orientation to reduce the "missing from work" time of their employees due to education. Less than one percent of respondents would choose distance learning, while 1.67% would choose an interactive e-learning (Figure 2).

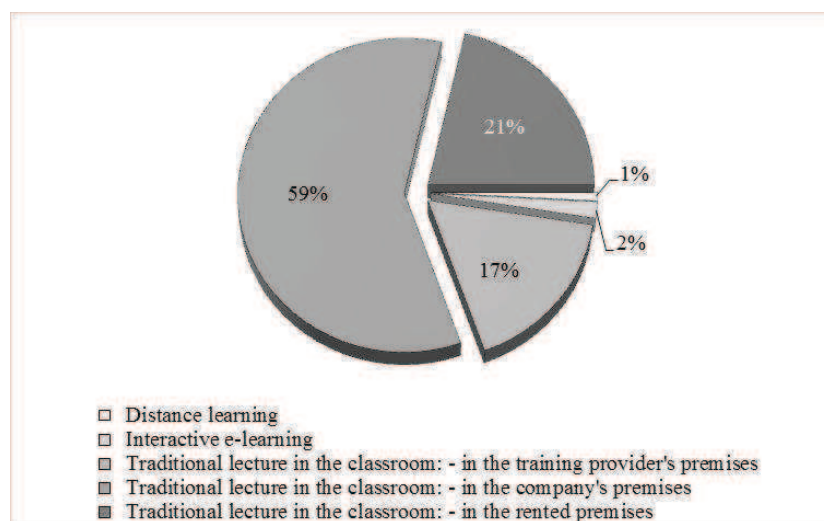


Figure 2: Appropriateness of media or educational performance methods



A similar situation is found in entire Slovenia. In 2010, 4615 different adult education programs were performed. Among education programs there were 1.8 % interactive e-learning and almost 91 % in the classroom as traditional lecture. The rest accounted for the other forms of education (practical work, workshop, guided self-study and other).<sup>10</sup>

Table 2: Model/matrix of specific competences (knowledge catalog) for different work areas

Knowledge	Competences	Work area						
		Management	Supply	Sale	Production preparation	Production	Finance	Development
Governance	plans and organizes his/her own work and the work of others to achieve business excellence							
	plans and organizes his/her own work and the work of others within the project approach							
	develops his/her own entrepreneurial qualities, skills and behaviors							
	plans and organizes his/her own work and the work of others and is able to use modern motivational approaches							
Communication skills	interacts and communicates with colleagues, thereby using modern communication media							
	interacts and communicates in a professional foreign language							
	interacts and communicates with colleagues, customers and the public; mastering the art of negotiation							
Strategic and tactical planning	plans and develops a business plan at the strategic and tactical level and monitors its implementation							
	prepares, coordinates and monitor the operational plan							
Marketing and product development	develops new products according to his/her own ideas or customer's ideas							
	knows and uses modern marketing methods in the frame of marketing mix							
Legislation, standards and tenders monitoring	knows the novelties and knows how to follow the development of legislation and regulations; ensures the quality and efficiency of the work in the working environment in accordance with the regulations							
	knows the novelties and knows how to follow the development of standards; ensures the quality and efficiency of the work in the working environment in accordance with standards							
	knows how to find information on tenders and how to declare							
Business Informatics and Computer Science	knows the methods of effective business process management and optimization							
	knows the novelties in business informatics and plans their implementation; applies modern ICT							
Financial reports	uses financial reports and understands their meaning; actively cooperates in the preparation of financial reports							
Production preparation	knows and applies modern approaches to technological and operational preparation of the production							
Modern	knows the news and monitors the development of the							

<sup>10</sup> BRENK, E.: *Pregled ponudbe izobraževanja odraslih v Sloveniji v letih 2010/2011 - poročilo in analiza*. [online]. Ljubljana : Andragoški center Slovenije, 2011. [cited 2012-04-02]. Available from: [http://pregled.acs.si/dokumenti/porocila/PregledIO\\_2010.pdf](http://pregled.acs.si/dokumenti/porocila/PregledIO_2010.pdf)

technologies and materials	profession at wood processing technology field							
	knows the novelties and monitors development of materials							
Environmental	rationally uses energy, materials and time, protects health and the environment							
Creative thinking	thinks creatively and is innovative							

*Legend: competence is important for work area marked with grey cell*

## 4. Conclusions

The formal educational structure in Slovenian wood industry companies has improved in recent years but is still poor. This is one of the obstacles in the transition to production of products with higher added value, which is crucial for long-term success of the branch. In the survey, a significant shortfall of individual knowledge and competences to perform the work at various work areas for employees with more than ISCED 3 level of education were determined. Rare are work areas and tasks for which it could be argued that employees are fully proficient for them. There are many of those, for which we claim a lack of knowledge and that additional education is required. Wilcoxon Signed-rank test proved that the difference between the importance of knowledge and current level of knowledge was statistically significant in all areas of work. Detailed analysis shows that the most critical knowledge are those associated with the products development and marketing, with management and business planning, with tracking novelties in development of materials, technology and legislation, with production preparation and with informatisation of business. In addition, employers believe that employees are missing some general competences, including sense for self-initiative, innovation and creativity.

On this basis, a model/matrix of specific competences (knowledge catalog) for different work areas was formed. It can be the basis for long-term human resources development planning in the wood industry companies, what is rarely present at the moment. In this model, the necessary competences to successfully perform the tasks for different work areas were formed. Companies can, based on this model, prepare an individual plan for education/training of their employees. The model can also be very important information for education providers. They have to keep in mind the content and education performance customized according to companies' wishes. This is quite an important factor in deployment of employees to education, because of its great influence to their absence from work. By this, the wide applicability of the model in practice is achieved.

We can conclude that level of knowledge in the wood companies, in general, is pretty unfavorable for the transition to a modern knowledge-based society, which require from companies creativity and fast adaptability of business. This situation is partly consequence of the poor formal educational structure and lack of knowledge/competences. In every work area, not matter of formal education of employees, are some tasks, for which employees mean that they do not have sufficient knowledge and/or competences for their quality performance. It is therefore essential for companies to enable to employees a systematic and continuous (lifelong) education/training.

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# APPLICATION OF THE METHODOLOGY OF MARKETING MIX OPTIMAL STRUCTURE FOR THE SELECTED PRODUCT FROM THE WOOD-PROCESSING INDUSTRY

*Alena Kusá*

## **Abstract:**

The decisions of a company when choosing the most appropriate marketing tools aim to create an integrated system of methods, forms and preferences to achieve the most effective results in sales promotion. The aim of the paper is to present the application of the methodology for marketing mix optimal structure of a selected product from the wood-processing industry, expenses and budget determination of marketing tools for optimal sales and profit maximization. The results of the research indicate the measures the company would use in sales, product pricing and setting the costs of marketing mix for a particular product in wood-processing company. This means that a company must be able to divide its funds appropriately and does not have to spend more useless money than it is actually necessary.

## **Key words:**

marketing mix, marketing mix optimization, profit maximization, profit and sales equation, marketing budget

## **1 Introduction**

Marketing is the part of the business activity of the company. The role of marketing is to create and maintain a balance between business objectives and opportunities, but also between supply and demand.

Traditional marketing at the strategic objectives realization is based on a marketing mix model called the "4P", which presents a set of activities aimed at the creation, appreciation, promotion and distribution of ideas, products and services, to make the exchange in the market to reach determined individual and corporate objectives.<sup>1</sup>

The formulation of the classical marketing mix identifies the tools that are operatively the most important when applying the determined marketing strategy set out by the company. In a particular marketing situation these marketing mix tools have different relative importance. Decisions about the marketing mix selection lead to creation of the integrated system of methods and tools to reach the most effective results in the desired time by their parallel using in the market.

The paper's aim is to apply the methodology of marketing mix optimal structure for the chosen product of the company operating in a wood processing industry, to determine the marketing mix expenses on marketing mix and the marketing tools budget for optimal sales and profit maximization. The paper presents only chosen parts of the research study - the solution methodology, including methods and partial results. There is not concretized the company's name and product in order to protect information that the company wanted. For this purpose, for the specific product of the wood processing industry we use the abbreviation "PS" and for the company we use the abbreviation "ST".

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<sup>1</sup> KOTLER, P.: *Marketing management – Analysis, Planning and Control*. New York: Prentice Hall, 1992, p. 385.

## 2 The methodology application for the “ST” company

In theory of marketing resources effective allocation according to Kotler<sup>2</sup> this issue is explained by the profit and sales equation, through which it is possible. By their concretization it is possible to reach maximum profit at the optimal sales and to find out the expenses for individual tools of marketing mix.

We can also determine the disposable budget of the company for individual tools of marketing mix.

We used regression analysis when realizing this intention – marketing mix tools’ influence on the demand, economical methods for expressing profit and sales response functions, mathematical-statistical methods to calculate these parameters and their verification by statistical tests - F-statistics.

Kotler’s model of efficient allocation theory of marketing resources was for the need of wood-processing industry of the Slovak republic adjusted to the conditions of a particular wood-processing company “ST”. It is the inclusion of factors that are actually used in the industry and used by the company. We had to regard the profit and sales equations and then to set the model for marketing mixes, from which we followed when giving input data into the regression analysis.

Implementation of the marketing resources effective allocation model was performed on selected “VS” product, which is one of the main products of the company and is inextricably connected with the company’s name.

The profit equation was adjusted to the “ST” company, where we considered the price list and fixed costs were allocated to the product line, which involves the “PS” product.

The profit equation for the “ST” company is:  $P = q * (p - VC) - FC - MC$ , where: P = profit from “PS” product, q = number of product sold, p = price list, VC = variable costs, FC = fixed costs of the product line, MC = marketing costs.

Factors that influence the sales volume “q” are given by the sales equation. Variables that may be influenced by our company and the company can influence the sales volumes through them are: list price “p”, variable costs “VC” and marketing costs “MC”.

The sales equation for the “ST” company is  $q = f(p, VC, MC)$ . We divide the marketing budget “MC” into marketing communication A, S and PR and S, distribution D and service s.

The sales equation has the modified format:  $q = f(p, VC, A, S, PR, D, s)$

These individual components contained in the sales equation represent marketing mix, which is applied in the “ST” company.

For the determination of profit maximization we designed a Table 1 that combines individual combinations of possible marketing mixes to ensure maximum profit. We extended it by variables really used by the “ST” company.

The next step is to estimate the probable sales, which corresponds to different marketing mixes. The estimate of probable sales was determined according to expert estimate of the “ST” company. Its employees know how to assess how the situation will develop following the determined components of the combination mix and their individual costs. The estimate is based on long-time operating in the industry and knowledge of market response to the stimuli that are created by the company

Regarding the profit equation and expenses specification on marketing tools that we have divided into separate components: A – advertising expenses, S – sales promotion expenses, PR – public relations expenses, D – distribution expenses and s – service expenses, we get the relationship:  $P = q * (p - VC) - FC - A - S - PR - D - s$

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<sup>2</sup> KOTLER, P.: *Marketing management – Analysis, Planning and Control*. New York: Prentice Hall, 1992, p. 390.

This equation meets the needs of the “ST” company to determine the product line profit by counting the components that are really involved in the profit making.

Table 1 Marketing mixes for profit pre maximization

Marketing mix Nr.	Price €/pcs	Advertising €/year	Sales Promotion €/year	Public relations €/year	Distribution €/year	Service €/year	Units sold pcs/year	Profit €/year
1.	p1	A1	S1	PR 1	D1	d1	Estimation	?
2.	p1	...	...	...	...	d2	Estimation	?
3.	p1	...	...	...	...	d3	Estimation	?
...	p1	...	...	...	...		Estimation	?
243.	p1	A3	S3	PR3	D3	d3	Estimation	?
244.	p2	A1	S1	PR1	D1	d1	Estimation	?
245.	p2	...	...	...	...	d2	Estimation	?
246.	p2	...	...	...	...	d3	Estimation	?
...	p2	...	...	...	...		Estimation	?
486.	p2	A3	S3	PR3	D3	d3	Estimation	?
487.	p3	A1	S1	PR1	D1	d1	Estimation	?
488.	p3	...	...	...	...	d2	Estimation	?
489.	p3	...	...	...	...	d3	Estimation	?
...	p3	...	...	...	...		Estimation	?
729	C3	A3	S3	PR3	D3	d3	Estimation	?

Source: VOLLMANN, M.: Optimization of marketing mix tools and economic evaluation by wood processing company. In: *PhD Thesis*, p. 75.

where:

p1, p2, p3 = low, median and high price level,

A1, A2, A3 = low, median and high level of expenses on advertising activities,

S1, S2, S3 low, median and high level of expenses on sales promotion activities,

PR1, PR2, PR3 = low, median and high level of expenses on PR activities,

D1, D2, D3 = low, median and high level of expenses on distribution activities,

s1, s2, s3 = low, median and high level of expenses on services.

We do not present all combinations of marketing mixes in general form because of their extent.

The sales volume q expressed by its individual components that influence it, result from the sales equation and its exponential form:  $q = b * p^p * A^A * S^S * PR^{PR} * D^D * s^s$ , where: b = extent coefficient, p = price elasticity, A = advertising elasticity, S = sales promotion elasticity, PR = PR elasticity, D = distribution elasticity, s = service elasticity.

The elasticity of individual marketing expenses components gives us the percentage changes in the value of the components in the case of 1 % expenses change of the marketing expenses component.

After completing the sales equation and its substitution into the profit equation we get such a profit equation that does not take into account the elasticity of the individual components of the marketing mix used in the “ST” company.

$$P = b * p^p * A^A * S^S * PR^{PR} * D^D * s^s * (p - VC) - FC - A - S - PR - D - s$$

After substitution of concrete numbers into the given equation we get marketing mix which will maximize the profit of the "VS" product the most of all.



Based on other procedures for concrete data from the company we used mathematical-statistical methods - first degree derivative, regression analysis and dependence verification of the individual components of the marketing mix by statistical test F-statistics.

### 3 Results

Among the most difficult marketing decisions that companies must make belongs decision about the expenses amount on marketing communication. We can find very high but also very low expenses in the industry.

Expenses on marketing communication in the “ST” company are appointed according to the method of objectives and tasks determining, where the specific goals are defined, the tasks for their achieving are determined and the amount of expenses for their realization is estimated. Subsequently the budget is set. It specifies amount and purpose of its usage. This method is then verified by the method of turnover percentage, where the amount of budget for marketing communication is determined on the base of a percentage of the expected sales volume. It controls the previous method, where it is found out if the budget is not underestimated or vice versa, overestimated.

Based on records from the “ST” company we know what the expenses structure on marketing communication looks like. After its analysis we can divide individual tools into advertising, sales promotion and PR.

Determining the expenses on marketing communication is important in estimating the marketing combination, from which we can calculate by the regression analysis the optimal expenses on marketing communication that will promote the sales at the appointed optimal sales price, advertising, sales promotion, distribution and service.

The amount spent on marketing activities for the company’s “ST” product is 37,233€/year. On the basis of economic cooperation department of the company and the subsequent division of expenses among individual marketing communication tools, we have come to the following division of marketing expenses for the “VS” product:

- Advertising activities – 15 000€/year.
- Sales promotion – 16 666€/year.
- Public relations – 2 000€/year.

For the profits optimization on the base of price combinations for further calculations it is important to know the variable costs of a product, sales price (which is the base for determination of medium, minimum and maximum prices into the combination mix in Table 2, following the expert estimate) and fixed costs.

Table 2 Price and costs from combination mix

Variable costs	18 333,3 €/pcs
Fixed costs on products group	700 000 €/year
Sales price	3 666 €/pcs
Minimum price	3 400 €/pcs
Maximum price	4 000 €/pcs

Source: Internal records of the “ST” company

The “ST” company uses the direct distribution channel. It means it sells its products directly to the final consumer without the inclusion of intermediaries. The sum spent on distribution is 907€/year.



Among expenses spent on service associated with the product in the “ST” company belong samples and surface treatment of individual contracts recording. These are kept for possible complaints or new customer orders. On-line counseling by internet, e-mail and telephone belongs to other service tools. The warranty period for the “ST” product is 5 years. This is considered to be a service that is connected with the service expenses. The amount spent on service activities is 2,660 €/year.

Probable sales must regard estimation, because it is a dependent value, which is influenced by other independent elements, e.g. price, expenses on marketing communication, distribution and service. This way is called the expert method.

These sales estimates are determined on the base of long-time periods of the managers’ experience (working in the company) and the issue knowledge, respectively knowledge of the influences operating in the industry. We followed the salability analysis of this product in previous years with regard to trends and forecasts for the future. These estimates are show in Table 3 with various combinations of the marketing mix components.

Table 3 The variable structure for the combination mix

	Price €/pcs	Advertising €/year	Sales promotion €/year	Public relations €/year	Distribution €/year	Service €/year	Probable sales pcs/year
Min.	3 400	3 833	4 166	500	666	666	88
Med.	3 666	15 000	16 666	2 000	2 666	2 666	75
Max.	4 000	17 333	19 166	2 333	3 166	3 166	67

Source: VOLLMANN, M.: Optimization of marketing mix tools and economic evaluation by wood processing company. In: *PhD Thesis*, p. 75.

Data on the marketing costs structure, price and estimated sales were used for individual combinations of marketing mixes, which were 729. They resulted from a theoretical model 3<sup>6</sup>. There are six combinations of marketing variables, three different prices and the expenses on marketing activities - medium, high and low level. These combinations can bring us maximum profit by other calculations.

Further procedures consisted in calculating the profit and sales equation for the “ST” company after their substituting by concrete numbers and making the logarithmic and regression analysis. The results of regression analysis give us the finding that the model is reliable and based on the F-statistics we found out that H<sub>0</sub> is rejected. We accepted H<sub>1</sub>: The regression model is statistically very significant.

After substituting the sales equation we get an exponential sales equation:

$$q = 6003565646 \cdot 1869200000 \cdot 000 * p^{-4,38495} * A^{0,15581} * S^{0,047538} * PR^{0,015253} * D^{0,003136} * s^{0,001205}$$

It results 6 statements from this equation:

- If the price increases by 1%, the quantity sold will decrease by 4.39 %.
- If the expenses on advertising increase by 1%, the quantity sold will increase by 0.16 %.
- If the expenses on sales promotion increase by 1 %, the quantity sold will increase by 0.05 %.
- If the expenses on PR increase by 1 %, the quantity sold will increase by 0.02 %.

- If the expenses on distribution increase by 1 %, the quantity sold will increase by 0.003 %,
- If the expenses on service increase by 1 %, the quantity sold will increase by 0.001 %.

After further mathematical modifications of the profit and sales equations we calculated optimal values of marketing mix that would maximize the profit - 224,104 €/year, with sales of 698 pieces of the “PS” product at the price 2,375 €/pcs, expenses on advertising – 58,971 €/year, expenses on sales promotion - 17,992 €/year, PR - 5,773 €/year, expenses on distribution - 1,186 €/year, expenses on service - 456 €/year.

The maximum budget for the marketing mix would be:  $A + S + PR + D + P$ , it means 84,378€/year.

The real company’s opportunities follow the specific restrictions on marketing expenses, based on the planned budget of the company, where the overall company’s working must be taken into account of the. It was calculated that if the company wants to achieve maximum profit, it will be necessary to spend 84,378 €/year on advertising, sales promotion, public relations, distribution and service. Actually, it invests only 37,233 €/year in these activities now.

It is the unreal for the “ST” company to invest such an amount only in the marketing mix.

In this model 698 units of product/year should be sold. Such amount is not possible to sell on the Slovak market because of limited capacity of the market, home building rate and consumer demand. So far, the quantities sold have moved at about 80 to 90 units per year.

Another factor is price. At the calculated price of 2,375 €/pcs the company achieves the maximum profit, provided the above-mentioned high sale, which is unrealistic. In the case of lower sale the company would not achieve any profit at the mentioned price and it makes a loss.

After consultation with the company, we concluded that the price should be set at 3,400 €/pcs, what is the minimum price, which entered into the regression analysis. The price maintains a luxurious nature of the product in the minds of consumers as well as it satisfies the business needs of cost-plus covering. The marketing communication budget of this product was also modified.

Expenses on marketing communication would present 43,704 €/year. After consultation with the “ST” company, we determined that this amount would be in the company’s financial options. By the financial resources modification we have found out that at the price of 3,400 €/pcs, and the expenses on advertising of 30,545 €/year, the sales promotion 9,319 €/year, PR 2,990 €/year, distribution 614 €/year, service 236 €/year, at the optimum sales, the company would sell 125 pcs of the “VS” product, which means the expected profit from the sales of 82,339 €/year.

## 4 Conclusion

Compared to results from the model, the “ST” company had to proceed to marketing expenses reduction almost by half, to use the minimum price of 3,400 €/pcs provided that the “VS” product increases the sales of nearly 68 % next year to achieve the expected profit.

It results that it depends on the marketing department employees’ effort how they find new customers –in the country and abroad.

The company must be able to divide their funds appropriately and it does not have to spend uselessly more money than it is actually necessary.

Despite these findings, it is important to state that the “ST” company should be more interested in pricing policy, because the price changes cause changes in demand. That means

if the price increases by 1 %, the quantity sold decreases by 4.39 %. Expenses on marketing communication cause only slight increase in sales. That is relative with the nature of the “VS” product. Further step is to make sales efforts more intensive in finding new customers and focusing not only on the segment of consumers, but also on business clients.

Finally, it is necessary to state that managers must search if the investment return from marketing budget is effective, to search competition and what price is the market able to accept.

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# THE ECONOMY OF PERFORMANCE OF THE UPPER CNC MILLING MACHINE FOR SMALL SLOVAK ENTERPRISE

*Monika Kvietková – Štefan Barčík*

## **Abstract**

This paper deals with the costs of operation and maintenance of the upper CNC milling machine under conditions of a small enterprise in context with the general calculation formula. It interprets the market research and characteristics of CNC machines utilization within SR. It points out the necessity of machines application in the medium-sized enterprises as well as in small forest-based enterprises.

## **Key words:**

costs, market research, CNC milling machine

## **Introduction**

The wood processing industry, comprising the timber, furniture and cellulose-paper industries, plays a specific role in the national economy. The recent increasing demand for a variety of new, more complex products has forced people to pay increased attention to developing such products, which is directly and inseparably related to the development of new manufacturing technologies. Both the timber and furniture industries have to adjust to this trend. The furniture industry generates demand for a high degree of finalization of wood. In order to secure competitiveness, the furniture industry requires machinery and technological innovation to achieve higher productivity and reduce the manufacturing costs.

## **Theoretical analysis of given problem**

Milling is a very widespread method of cutting operations done on wood and woody materials. The purpose of milling is to process a part (generating chips) to the desired dimension, shape and surface finish. According to Lisičan (1996), milling is a process of cutting wood with cutting edges along the perimeter of a rotating tool, while the part moves in a direction perpendicular, or approximately perpendicular to the axis of rotation of the tool, while the cutting depth (i.e., removal depth) is less than the thickness of the part and the diameter of the tool, with a cycloid indicated cutting movement and chip thickness within the interval  $0 < h < h_{\max}$  (Fig. 1).

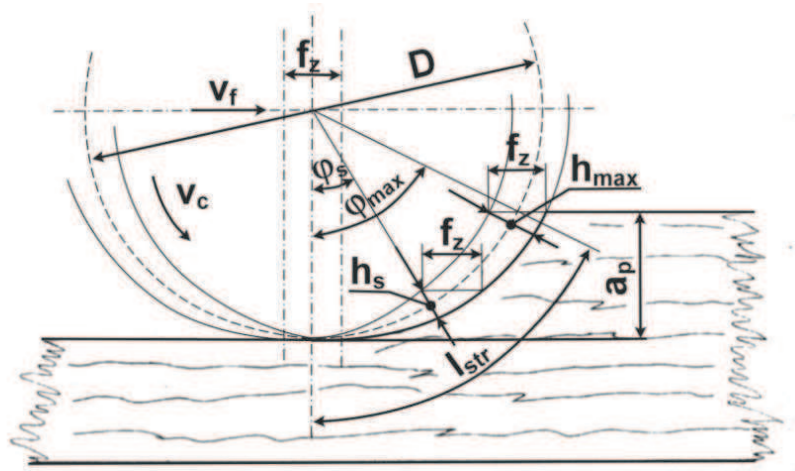


Fig. 1: Milling kinematics

### CNC routers

These belong among the basic CNC wood-cutting machines in furniture making. They mostly work on two-dimensional and three-dimensional (special benches) wooden pieces as well as plastics and lightweight metals. The machines are fitted with between 1 and 3 working spindles of a boom design, and a single or tandem work bench with automatic tool (fixture, working assembly) replacement.

### Cost calculation

The basis for calculating the total costs is an effort to assign all the company costs to the constituent operations. It is compiled based on a calculation formula and an applicable calculation method.

General calculation formula:

1. direct (unit) material,
2. direct (unit) wages,
3. other direct costs,
4. operating (production) overheads,
1. - 4. *Actual production (operation) costs,*
5. administrative overhead,
6. sales costs,
1. - 6. *Actual performance costs,*
7. profit (loss),
1. - 7. *Selling price.*

### Market research

Systematic collection of information is the foundation for marketing decision-making and definition of the marketing strategy. Market research is systematic scientific corporate market research or information collection. These are targeted and effectively chosen costs.

Market research follows the below process:

1. definition of the information need,
2. financing,
3. definition of research methods and timetable,
4. evaluation, analysis.



## Methodology

As a rule when calculating costs using the cost calculation methods, one only experiences difficulty defining the indirect costs per the calculation unit, because the consumption of costs corresponding to each calculation unit can be quantified accurately for direct costs. Based on the purpose of the research, market research can be described either as qualitative, direct (obtaining information directly from the market) and causal by nature, or it is used to determine factors that may affect the subject matter and their interrelations. Written inquiry is a method used for data collection in marketing research. Two modes were applied: a direct written mode and one using electronic mail. Inquiry is one of the most commonly employed information collection methods in marketing research. It consists in communication with the persons queried, known as respondents.

## Results and discussion

Cost savings and indirect improvements to operating reliability, quality and continuity of production become a company's advantage. Reducing the costs of spoilage, downtime and error is a priority indicator for the company managers. The task of the managers is to optimise these indicators in order to achieve a maximum efficiency of the comprehensive management system.

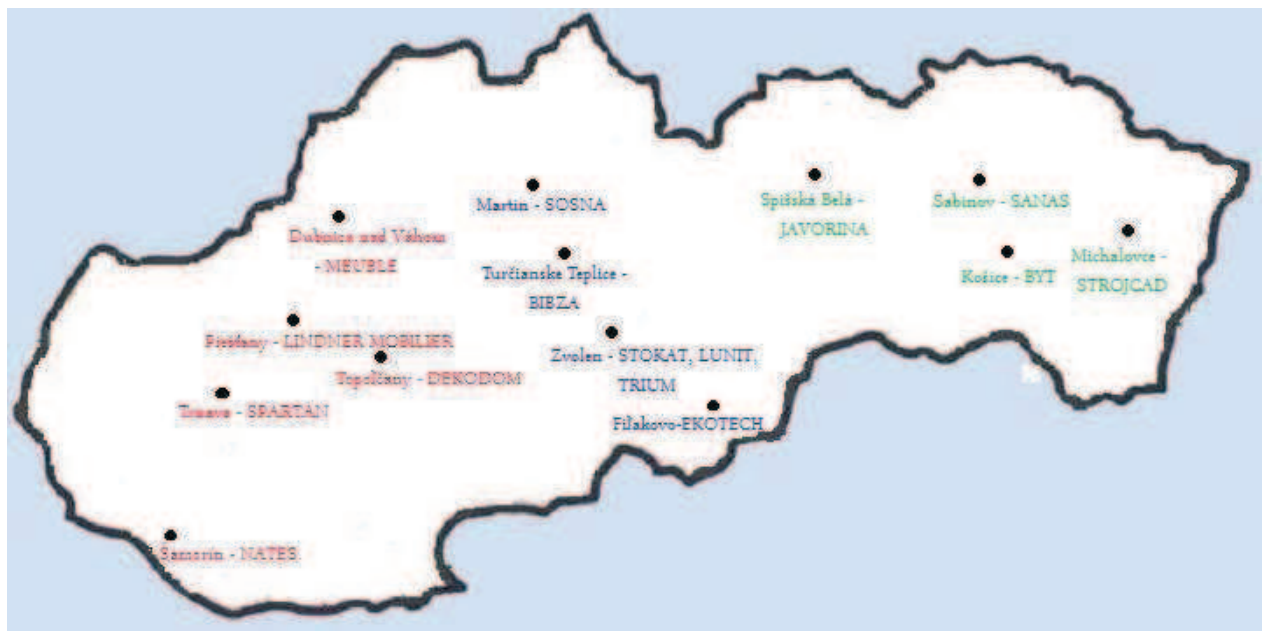


Fig. 2: Manufacturing facilities using CNC milling machines

The market research showed that manufacturing facilities using CNC routers mostly deal with manufacturing of various types of furniture. The companies SPARTAN, BIBZA, and SANAS focus on office furniture manufacturing; NATES, EKOTECH, MEUBLE, and DEKODOM manufacture home furniture. Home furniture is also the specialization of SOSNA, which produces exclusively pine furniture, and JAVORINA, which produces oak furniture. LINDNER MOBILIER deals with manufacturing custom-made furniture for hotels, restaurants and banks. Other companies, STOKAT and TRIUM, focus on manufacturing self-supporting staircases. LUNIT specialises on furniture doors. The specialisations of companies

using CNC machines are shown in Fig. 3, which indicates that CNC milling machines are mostly used in Slovakia in companies that manufacture home and office furniture.

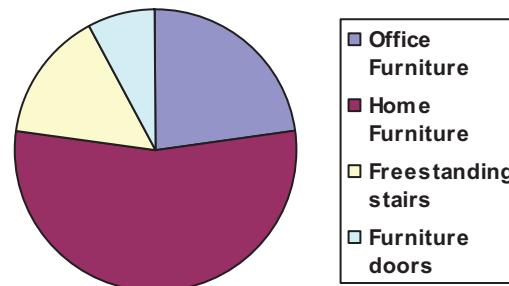


Fig. 3: Company production specialisations

## Conclusion

The compilation and correct arrangement of a calculation formula requires a thorough understanding of the job, the planned technology, work procedures, the requirement on work post utilization, number of staff, etc. The cost accountant should acquire these and other data from production preparation, because there is no room for a detailed project preparation at the time of calculating a quotation price, which is why the cost accountant should make use primarily of existing overhead cost standards at this stage when calculating the production overheads.

The wood processing industry is a strategic manufacturing industry in Slovakia, as attested by the large number of small and medium-sized private wood processing companies. To be able to succeed in competition against big companies producing massive quantities of products, the small company needs to be vastly more flexible in its production range. The versatility of CNC machinery is the ideal solution. After all, a CNC machine is ultimately cheaper than several single-purpose machines for which it can substitute.

The fact that this global trend has been spreading in Slovakia too is attested by the sales of CNC machines made by the Italian manufacturer Biesse S.p.A. Pesaro. ROVER computer-controlled machines are among the world leaders in the CNC category. These machines can be found in SPARTAN (Trnava), Lindner Mobilier (Piešťany), BIBZA (Turčianske Teplice), SANAS (Sabinov), etc. Italian CNC machining centres also include the SCM brand, distributed mainly by BOTO in Nové Zámky. Another world CNC machine tool manufacturer is the German company HOLZER, represented by EXCELLENT CD in Zvolen. The biggest distributors of CNC machines in Slovakia are BOTO (Nové Zámky), Kráľ (Žilina) and EXCELLENT CD (Zvolen).

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# THE IMPORTANCE OF MARKETING IN THE PROCESS OF INCREASING COMPETITIVENESS

*Jozef Matúš*

## **Abstract:**

In this paper the author addresses the increasing competitiveness through the implementation of new trends in marketing. How important success factors in this process is considered a marketing innovation. Stresses that in terms of innovation must be a comprehensive approach to the innovation process. In addition to the use of new trends in marketing, which will significantly enhance competitiveness, examines the competitive advantages a rising from the process used customer relationship management (CRM). Also deal with the increasing competitiveness in the transition from the source of the economy to a knowledge economy. In this context stresses the crucial role of increasing investment in human capital and the need to increase their educational level. It also points to the ever-growing role of educational institutions and especially universities in this process.

## **Key words:**

price competition, the value for the customer, innovations, competitiveness, competitive advantage, marketing, marketing strategy, marketing communication, new trends in marketing, non-price competition, customer relationship, management, social networks, the level of education, science and research, the customer, knowledge-based economy

If we want to highlight the importance and role of marketing in solving the problem of creating a competitive environment as a tool to increase competitiveness of both companies, but also regions or whole countries, we must remember the words of Peter Drucker - one of the leading thinkers of the 20th Century's management and business: "Business has two and only two basic functions - marketing and innovation. Marketing and innovation fruitful results, all the rest are costs. ". This also applies to the area of competitiveness. Marketing as well as the tools themselves become the instruments of competition, but also competitive advantages respectively. means to increase competitiveness. This can give the example of the analysis of competition in the supply and price competition, as a competitive tool by using the price battle, but also in terms of marketing value for customers and non-price competition, which is used as competitive tools such as the fight. marketing communications (advertising, sales promotion), as well as product characteristics (quality, design, packaging), but also extend the product - that is, additional services and benefits consumers (service, hire purchase, the guarantee). Based on the analysis of competitive advantages that competitive advantage based on the higher value for the consumer, which has a significant impact on the price of the product. The success and effectiveness of meeting the demand depends on the competitive advantages offered products. In this context it should be noted that successful companies have a common denominator, which is a comprehensive orientation to the customer's full satisfaction of his needs and desires, and it highlights the importance of marketing in the process of enhancing the competitiveness is the proper and effective use of marketing principles and tools. The next assumption of successful corporate management, brand building, but also consider increasing the competitiveness ability to differentiate themselves from competitors through innovation, which will focus not only on product but also the processes that take place in the company, for example. process of product marketing

activities - implementation of new forms of marketing strategies, but also organizational innovations - eg. changes in the division of labor respectively. in corporate governance.

Innovation is very effective in helping increase the competitiveness and also create appropriate conditions for their application in manufacturing processes in terms of new technologies and also increase the added value of goods and services.

Increasing competitiveness is imperative in the wood and furniture industry, which is characterized by that at all types of market sharpens competition, which ultimately leads necessarily to fight for every customer. When a company loses a customer and prospect of losing their development. It is therefore necessary that in a difficult competitive environment, companies but also other organizations realize the customer's needs and satisfy them (and more efficiently than its competitors in their activities have become a top priority). The first place must be given to solving customer problems rather than solving their own problems often non-essential. Taking into account the processes of globalization, advances in science and technology as well as rise, so to speak hyper environment, we must gradually modify and in some ways well established marketing approaches, methods and tools.

This requires:

- Ability to identify and properly evaluate market opportunities brought about by rapid development of science, engineering and technology and changes in their conditions, needs and desires of consumers;
- Based on the known values to formulate a market bid;
- Design value chain as a tool to determine the possibility of creating more value for customers, which provide the best expected value (based on competitive advantage) for the customer, but also for the company.

Although the specific conditions of market competition is a combination of price and non-price competition plays an important role just marketing tools, and category. Creating competitive advantage must be one of the fundamental objectives and marketing strategy.

In the process of building a competitive advantage, it is essential to identify what's really good company, what is its unique ability, the ability, which exceeds its competitors such. the quality, distribution, advertising and on the creation of competitive advantages that prove to be transformed and differentiated advantage with which it differs from that provided by the customer something unique, thereby increasing the quality level to meet the needs and desires.

An important tool of competitive struggle are the new trends in marketing, although so far to address this issue lacks a comprehensive approach and resonate particularly issues related to practical application.

We look for the appropriate answers to some current issues. Examples include solutions and answers to questions: These can be in the future marketing communications in a significant decline of traditional media and the dynamic growth of new media such as internet, mobile marketing, e-mail, social networks? What is the best and most effective especially in combination to increase the quality of the process of marketing communication. What and how will its innovative means of expression, but also whether to change its function and importance of each instrument. What will have to compete importance guerrilla marketing, its comparative advantage - low cost as a prerequisite for a good return on

investment. Similarly, the fuller use of viral marketing and the full impact of digital marketing.

To improve the competitiveness of companies or products. brands - increasing the role and importance and placement of paramount importance in this regard which is yet untapped potential of, a mobile marketing. There is increasing the importance of the implementation of marketing activities and social networks (especially Facebook and Twiter). It should, however, in this context to take into account that social networks are based on communication between users. When we want - and this is one of the basic conditions - social networks used in marketing, marketing communications, we must respect this fact. The importance of social networks have not yet seen in the field of building brand awareness, product advertising, sales promotion, but also in creating conditions for increasing the effectiveness of guerrilla and viral marketing.

Among the new trends in marketing, even when these values in terms of increasing competitiveness and thereby providing a competitive advantage to customers is customer relationship management (CRM). The concept of CRM is based on a thorough orientation to the customer if the fulfillment integrates all business processes and building a lasting relationship with customers by understanding and understanding the process whereby the customer creates for itself its own value and that value creation is a purposeful process in which customer meets its own goals, even if it's all about to create value to the company. From the perspective of customer relationship management in marketing is very important not only to satisfy their needs and desires, but also create them, able to anticipate their future needs. A very important feature of customer relationship management is the fact that this process takes place and a different perspective to improve the efficiency of market competition. While the traditional relationship between the customer and the company has its own way "hostile", given that companies try to sell as much as vice versa customers try to avoid buying or buy as many and as cheaply as possible.

In contrast, in the customer relationship management company customer perceives as his partner and the interaction between company and customers, as a process of mutual accommodation of interests and the interests of business customers that "power is transferred from the hands of manufacturers and retailers into the hands of consumers who now decide what products they want to receive, at what price, through the distribution channels, as well as marketing communication tools will be used. Can only emphasize that the concept of customer relationship management, based on the customer orientation and build profitable customer relationships, is also one of the basic resources to ensure more competitive company in terms *zostručej* the competition in the market. The level of CRM depends on external as well as internal factors. The external factors are important to mention the impact of Porter five competitive forces and to all firms that produce the same output, potential successors these and similar companies, the bargaining power of sellers, buyers' bargaining power and risk of substitution. The internal factors on the level and quality of the CRM are mainly knowledge potential of the company, top management support, but also the level of corporate culture. Customer relationship management is also under conditions of intense competition concept, respectively. tool that maximizes the relationship between customer and company especially through the understanding of individual needs and desires and using this process, while ensuring customer profitability for the company, which is an important factor in creating a form for the customer, and that this can adequately appreciate. It can be such. of exceptional quality, style, design, design and reliability associated with a lower price, respectively. lower cost. What is important is to exploit the ability to quantify the relationship value and competitive advantage. Although the analysis of existing knowledge about the process of

customer relationship management can clearly confirm that this process becomes a crucial factor in increasing the competitiveness of firms, while also increasing the efficiency of all marketing activities and marketing tools.

The growth rate of developed economies can be sustained only through the traditional factors of production. For this reason, in the current period to make a gradual transition from resource-based economy to a knowledge economy, based mainly on the materialization of scientific and technological knowledge. Expected to effectively support research and development, foresees the implementation of economic policies and promoting innovation and in particular requires the full support of human resource development.

The ability to absorb new knowledge and translate them into the production process and services depends not only on the ability of people, but also the quality of education. Prerequisite for building, but also the functioning knowledge economy is a highly skilled workforce as the result of education. The main goal of education is to increase knowledge, cultural, scientific, technical and related economic levels of society as a prerequisite for proper functioning of not only building a knowledge society and knowledge economy, but also complex socio-economic development of regions. In the globalized knowledge economy, universities are a source of knowledge, innovation and drive growth and contribute significantly to economic, social and cultural development of society.

One objective should be to strive to create a profile that would be able to prepare qualified professionals for not only economic system. Accepted then it becomes an educational institution which is a product of good management and also that in a difficult market environment, education must report marketing. Even in the management of educational institutions is desirable to apply the latest scientific knowledge in education management and marketing concept.

Universities are becoming a critical point of education experts with university education, an important workplace science, research and development. Integration of science and research, particularly in regional areas of applied research and also become the social and cultural centers of the regions. Their success and employability of graduates is somewhat dependent on cooperation with practice.

Increasing competitiveness is therefore imperative in the current period AJV wood and furniture industry and new trends in marketing should be applied in full in terms of companies have also given their importance in building a knowledge economy. It should be noted that the intensity of the competitive environment will only increase and that new trends in marketing, which will use sophisticated methods to help in this challenging competitive environment to identify a competitive advantage to adequately create the conditions for their further development. Inevitable in this period is defined as the need for new trends in marketing can be applied in the new economy - an economy based on knowledge and procedures and some basic marketing tools adapted to the requirements of the knowledge economy. When we approach or solution. we examine the factors of competitiveness (although this is difficult to measure a specific category), we must constantly be aware that in this process is the most important customer.

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# MODELS FOR FORECASTING THE IMPORTS AND EXPORTS OF FURNITURE

*Maja Moro – Darko Motik – Andreja Pirc Barčić – Leon Oblak*

## **Abstract:**

On the basis of established values in the period 2000.-2010., the paper discuss a possibility to predict future values of imports of furniture to Croatia, and the values of exports of Croatian furniture. The data of import and export values are gathered from Croatian Bureau of Statistics and include the main countries for the foreign trade activity with Croatia. The dynamic economic analysis of time series data was performed and two types of time series models were built: models based on average rates of change and linear trend models. Prediction is limited to year 2015. because of turbulences in this market and the length of analyzed time series.

## **Key words:**

furniture, import, export, time series models, forecasting

## **1. Introduction**

Furniture manufacturing, as a significant segment of Croatian wood industry, is characterized by numerous changes which carries a modern business world. Knowledge of the market situation directly affects on all companies in the sector, their development, growth and business success in the future.<sup>1</sup> Intense competition, which comes as a result of globalization and the imminent entry into the full membership of the European Union, leads us to the necessity of looking at the current market situation, in order to predict the situation in the future. The key to survival and growth in the market is in organization's ability to adapt its strategy to the rapidly changing environment.<sup>2</sup> According to Samuelson and Nordhaus, economic theories are dynamic by nature and now we are witnessing almost everyday changes that are caused by the penetration of IT and computer science revolution.<sup>3</sup> In this new and dynamic conditions it is necessary to strive for a new standards using economic theory for the qualitative and quantitative analysis of markets.

Interpreting economic data and forecasting the future economic values are under the influence of environment and government policies, starting from the basic economic theories that operate in the market.<sup>4</sup> Specific developments in some key macroeconomic variables, such as employment, production, imports, exports, the exchange rate of national currency, etc., characterize different turbulent periods of Croatian history.<sup>5</sup>

This paper discuss a possibility to predict future export and import values of Croatian furniture industry on the basis of established values in the period 2000.-2010. Because of turbulences in this market and the length of analyzed time series the prediction is limited to the year 2015.

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<sup>1</sup> MOTIK, D.: Tržište namještaja i ostalih drvnih proizvoda Republike Hrvatske do 2001. godine. Šumarski fakultet Sveučilišta u Zagrebu, Zagreb, 2002.

<sup>2</sup> KOTLER, P.: Upravljanje marketingom: analiza, planiranje, primjena i kontrola. Mate, Zagreb, 2001.

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## 2. Material and Methods

Analysis of Croatian furniture manufacturing follows the time course of two key macroeconomic variables, imports and exports for period 2000.-2010. The data were gathered from database of Croatian's State Bureau of Statistics (DSZ),<sup>6</sup> Ministry of Finance and Financial Agency (FINA).<sup>7</sup> The data are shown in Figures 1 and 2.

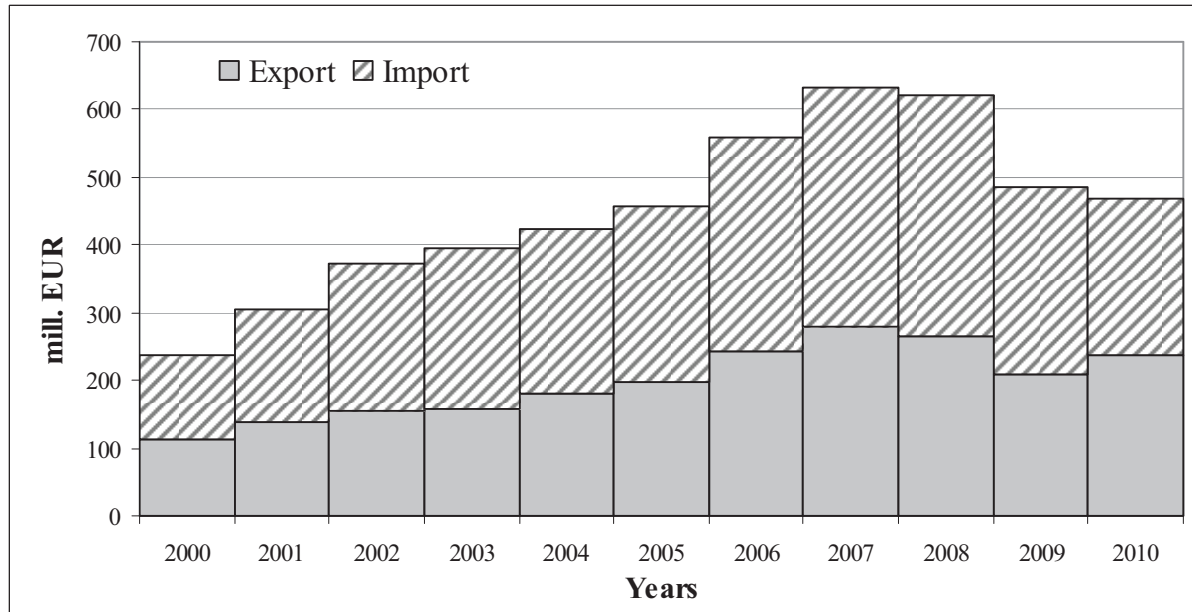


Figure 1. Export and import of furniture for period 2000.-2010.

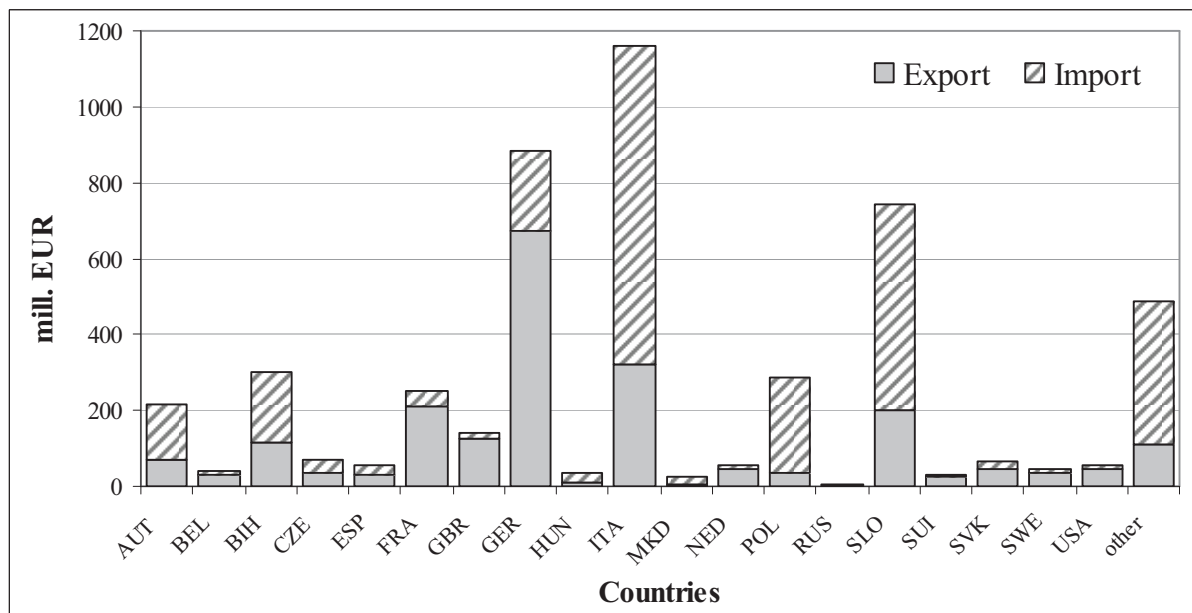


Figure 2. Share of furniture foreign trade for period 2000.-2010. according to countries

<sup>6</sup> DSZ: Statistički ljetopis. Državni zavod za statistiku, <http://www.dzs.hr>, different years.

<sup>7</sup> FINA: Financijska agencija Republike Hrvatske, <http://www.fina.hr>, different years.

The analysis involved only those countries that were included in both, export and import furniture trade with Croatia for all years in period 2000.-2010., and according to share of that trade in total amount.

For the purposes of forecasting future trends in the indicators of market conditions (export and import of furniture), the dynamic economic analysis of time series data was performed. Two types of time series models were built: models based on average rates of change (models A) and linear trend models (models B). According to Rozga and Grčić, by using models we got a picture of what happened in the (near) past, what is the current situation, and planned and future course of events, i.e. the movement of each indicator in the near future.<sup>8</sup>

### 3. Results and Discussion

Descriptive statistics (means and standard deviations in mill. €; coefficients of variations and average rates of change ( $\bar{S}$ ) in percentage) were determined for annual export and annual import of furniture for period 2000.-2010. Results are given in Table 1.

Table 1. Descriptive statistics for annual furniture foreign trade in period 2000.-2010.

Country	Code	Export				Import			
		Mean (mil. €)	Std. Dev. (mil. €)	Coef. Var. (%)	$\bar{S}$ (%)	Mean (mil. €)	Std. Dev. (mil. €)	Coef. Var. (%)	$\bar{S}$ (%)
Austria	AUT	6,5	2,4	36,5	11,2	13,2	8,0	60,6	15,7
Belgium	BEL	2,7	1,3	48,1	2,7	0,9	0,3	31,2	-6,6
Bosna and Herzegovina	BIH	10,5	1,9	17,8	-2,4	16,8	8,2	48,8	26,2
Czech Republic	CZE	3,3	2,6	77,5	30,3	3,0	2,0	65,4	13,2
Espana (Spain)	ESP	2,9	2,4	81,8	47,2	2,0	0,8	41,4	12,5
France	FRA	19,1	5,7	29,7	-4,9	3,7	1,9	51,0	16,5
Great Britain	GBR	11,4	3,5	31,1	-9,8	1,5	0,5	33,1	3,2
Germany	GER	61,2	28,5	46,5	15,2	19,0	6,9	36,1	10,4
Hungary	HUN	0,8	0,4	53,7	4,5	2,5	0,8	33,9	14,2
Italy	ITA	29,1	7,3	25,0	3,0	76,5	16,9	22,1	0,7
Macedonia	MKD	0,6	0,4	61,7	9,1	1,8	1,2	64,8	17,5
Netherlands	NED	3,9	0,9	22,7	7,7	1,2	0,6	53,1	15,6
Poland	POL	3,4	3,1	90,4	38,3	22,4	6,4	28,3	-0,8
Russian Federation	RUS	0,2	0,1	89,4	4,8	0,2	0,1	58,9	8,3
Slovenia	SLO	18,0	11,4	63,2	10,9	49,7	11,0	22,1	-2,0
Switzerland	SUI	2,1	0,8	40,5	11,3	0,6	0,3	52,2	12,2
Slovakia	SVK	4,2	7,3	173,1	84,7	1,8	0,4	23,1	2,6
Sweden	SWE	3,3	1,0	29,9	1,1	0,8	0,3	35,5	-9,4
United States	USA	4,1	2,5	61,0	-11,9	0,9	0,5	54,6	-3,2
Other countries	other	10,2	4,2	40,8	8,0	34,1	24,3	71,3	32,7
Total	$\Sigma$	197,6	54,1	27,4	7,7	252,6	71,7	28,4	6,4

<sup>8</sup> ROZGA, A. and GRČIĆ, B.: Poslovna statistika. Veleučilište u Splitu, Split, 2000.

According to the data shown in Figure 2 and the data in Table 1, in the analyzed period 2000.-2010. Germany is the most important export market for Croatian furniture which achieved 31% of total exports, followed by Italy (15%), France (10%), Slovenia (9%), Great Britain (6%), Bosnia and Herzegovina (5%) and other countries with less than 5% of total exports.

At the same time 30% of the total imports value of furniture in Croatia is generated from Italy, followed by Slovenia (20%), Poland (9%), Germany (8%), Bosnia and Herzegovina (7%), Austria (5%) and other countries with less than 5% of total imports.

Generally, 56,3% of total furniture foreign trade amount goes to three main export-import markets: Italy, Germany and Slovenia (54.8% of total furniture export value and 57,5% of total furniture import value). Results for these three most important markets are given in Table 2.

Table 2. The most important countries in furniture foreign trade for period 2000.-2010.

Country	Code	Export		Import		Total	
		mil. €	%	mil. €	%	mil. €	%
Italy	ITA	320,4	14,7	841,2	30,3	1161,5	23,5
Germany	GER	673,1	31,0	208,9	7,5	882,0	17,8
Slovenia	SLO	198,5	9,1	546,5	19,7	745,0	15,0
Other countries	other	981,7	45,2	1182,0	42,5	2163,7	43,7
Total	∑	2173,7	100,0	2778,5	100,0	4952,2	100,0

When the rates of change in successive time periods are approximately equal, and assuming that the average rate of change will not change, with the average rate of change can be predict variable values in future periods.<sup>9</sup> Based on the average rates of change for export (7,7%) and import (6,4%) of furniture in the observed period models A for prediction of future values of exports  $\hat{E}_A(t)$  and imports  $\hat{I}_A(t)$  were developed.

Correlation analysis to determine the degree of correlation between the values of export and import as dependent variables and time ( $t$ ) as independent variable was used. Pearson's linear correlation coefficient ( $r$ ) which describes the direction and strength of the correlation relationship was positive and high in both cases,  $r=0,8532$  for export and  $r=0,7205$  for import of furniture in the observed period, so we developed models B for prediction of future values of exports  $\hat{E}_B(t)$  and imports  $\hat{I}_B(t)$ .

Models A and models B for predicting the future values of exports and imports of furniture are as follows:

$$\hat{E}_A(t) = 112,7 \cdot \left(1 + \frac{7,7}{100}\right)^{t-1}, \quad \hat{I}_A(t) = 124,4 \cdot \left(1 + \frac{6,4}{100}\right)^{t-1};$$

$$\hat{E}_B(t) = 13,923 \cdot t + 114,1, \quad \hat{I}_B(t) = 15,565 \cdot t + 159,2.$$

Units for  $t$  in both kind of models is one year ( $t = 1$ , for year 2000.;  $t = 2$ , for year 2001.; etc.), and units for predict values of import and export are a million €.

<sup>9</sup> BLAŽEVIĆ, S.: Ekonometrija. Sveučilište Jurja Dobrile u Puli, Odjel za ekonomiju i turizam, Pula, <http://oliver.efpu.hr/~sblazev/Ekonometrija.pdf>, 2007.

According to the linear trend models (models B), the expected linear increase in the annual value of Croatian furniture export is 13,9 million € and expected linear increase in the annual value of imports of furniture for 15,6 million €. Empirical estimates of the regression coefficients in all models shown are higher than the critical value and the corresponding  $p$  values are negligibly greater than zero ( $p < 0.01$ ), so variable  $t$  (time) is not superfluous in the linear trend models for the export and import on Croatian furniture market.

The predicted values of exports of Croatian furniture using model A and model B, are graphically compared in Figure 3, and in Figure 4 are compared the predicted values of imports in the Croatian furniture market.

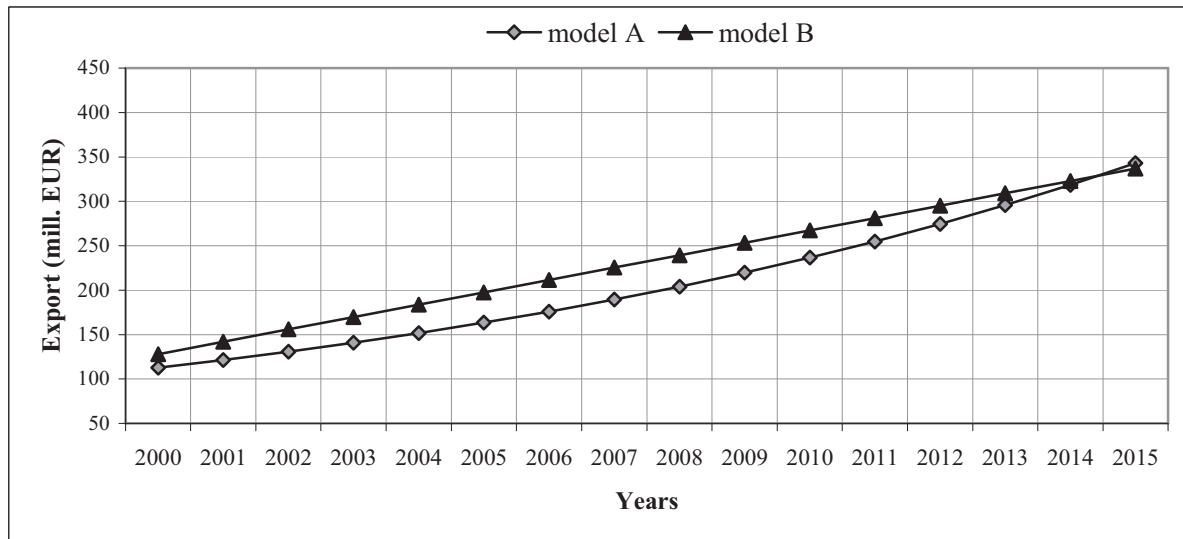


Figure 3. Comparison of the predicted values of furniture export

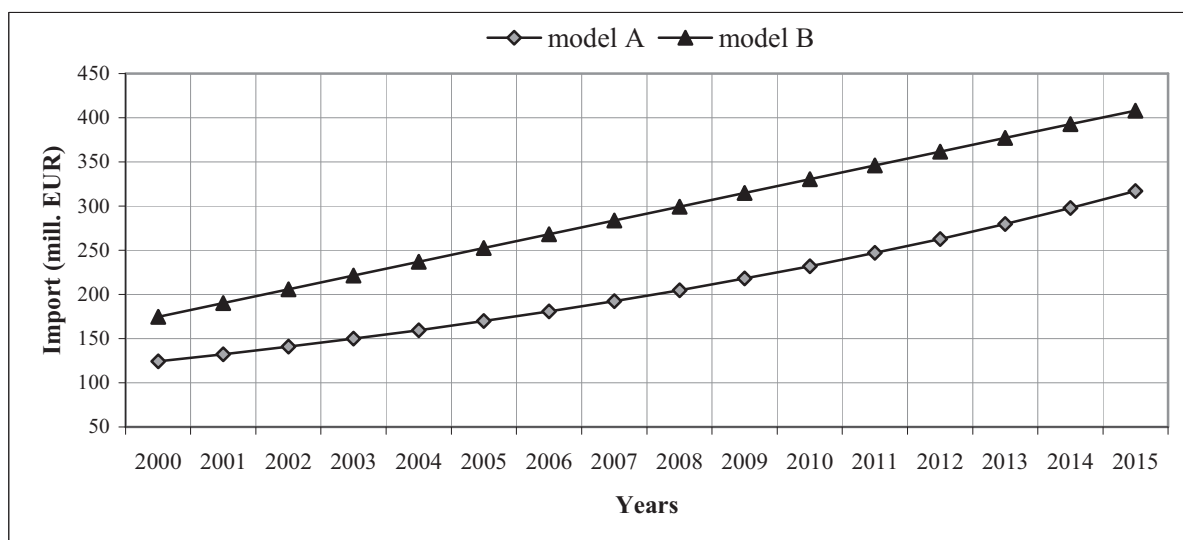


Figure 4. Comparison of the predicted values of furniture import

Testing the difference between model A and model B predicted values with actual values of imports and exports was left for further research.

## 4. Conclusion

Help at the strategic, tactical and / or operational level planning and decision making in managing the furniture industry, our companies can provide with the application of methods that have not been traditionally used. Using time series models companies in the furniture industry will be able to define the future business strategy, and the paper could also help to research institutions for decision-making and strategy development.

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# PROCESS-ORIENTED MARKETING ACTIVITIES IN WOODWORKING INDUSTRY

*Renata Nováková – Eva Habiňáková*

## **Abstract:**

Currently, a great importance is ascribed to the process orientation in quality management. A part of Juran's Quality Spiral involves also marketing, which represents the course of the main activities and supportive processes in the organization. Specific feature of marketing processes is that they focus on market analysis, marketing planning and development of marketing strategy within the organization, with the aim to promote sales of product and establish communication with customers. This paper intends to emphasize the importance of positive and negative aspects of process orientation in marketing and better performance of the company in competitive environment.

## **Key words:**

quality management, marketing, process orientation, Juran's Quality Spiral

## **Introduction**

The application of process approach is considered an efficient form of improving the management of economic organizations and building effective quality management systems. Process approach represents a form of the management of economic organization, which is much older than ISO standards for quality management systems, which appeared in the first decade of the previous century.

Regardless the formal approach predominating in most of the economic organizations, one of the reasons of insufficient application of the process approach in Slovakia is the fact that there are not enough publications available in Slovak language, which results in considerable simplification of the process approach application in the organisations' management.

Even worse is the situation in the process approach application in quality management systems. The systems were built in compliance with the standards of quality management systems and on the basis of functional approach, where groups of integrated actions were allotted to particular organizational structures of economic organisations, while the output of the sequence of actions was not unambiguously defined, or the outcome was the bare implementation of those actions regardless the final outcome. A purely formal approach to the application of process management is therefore quite frequent in the quality management systems in Slovakia. Such formal approach has been driven by the fact that though ISO quality management systems innovated in 2000 mention the necessity of introducing the process approach to quality management, yet the necessity is accentuated only verbally in the parts of the standards which are not actually binding. This was reflected in the fact that individual documents prepared for quality management systems according to the standards of 1994 based on a functional approach and quality management activities and describing the activities of quality management in the individual elements of this system, were only renamed as written procedures documenting the processes, while the elements of quality management were identified as processes. Practical transition to such a "process approach" thus affected neither organizational structure of, nor the way of quality management.



## Process-oriented management

Process-oriented management, usually identified with the concept of “process approach” in ISO standards, evokes a lot of loose ideas. The sources devoted to process management generally indicate three stages of the abovementioned process development:

- Stage 1 emerged in the first third of the previous century and is connected with Taylor’s theory of management. This approach was implemented in practice. Characteristic feature of that period of process management was the fact that no automation form of process management was used in the process of application;
- Stage 2 introduced a concept of “process management” denoted as the approach of “business process reengineering”, while processes being manually “reengineered”. The approach was also characterised by focusing mainly on the management of micro-processes, which is simultaneously a limitation of this approach;
- Stage 3 of process management is associated with the last decade and is characterised by its orientation rather on the complex economic organisation than on particular processes. Characteristic feature of the period is “change”. In this approach, the organisation capable of change is more valued than that being a market leader in the field, since change represents a perspective element in managing an organisation. If an organisation becomes a market leader, yet is not capable of change, it is supposed to lose its position in future. The period is simultaneously characterised by thorough automation of process management, however oriented on new or newly designed processes.

The abovementioned division of process management illustrates that so called process approach as a prerequisite of ISO standards for quality management systems practically concerns only Stage 1 of process management. In the application of process approach in quality management systems, neither implementation of automation in process management, nor changes of processes and organisational structures are common. In his publication *Management Challenges for the 21st Century*, Drucker defines two important requirements or aims:

- Development of a systematic and well-organised method for collecting the information on corporate activity in the field of market economy and competition;
- Integration of various procedures applied separately before, e.g. value analysis, process analysis, quality management and cost management in one general procedure.

## Hierarchy and structure of processes

Since process management has been in existence for nearly a century, there are numerous definitions of the process itself as well as process management and process approach. In order to deal with the process hierarchy and structure, it is therefore necessary to explain the key concept, i.e. process itself.

ISO standards 2000 define process as a “*sequence of procedures which uses resources to convert inputs into outputs*”. The output of process may be a product, service, information, etc. The ISO definition is not precise however, as it lacks a substantial aspect, i.e. meeting the customer’s expectations or requirements regarding the output. Only those process outputs bring profit to economic organisations, which satisfy the demands of a target customer. Output of a process must have certain value gained in the process of implementation. If customer appreciates the value, the process is effective; if not, the process represents a waste of effort.

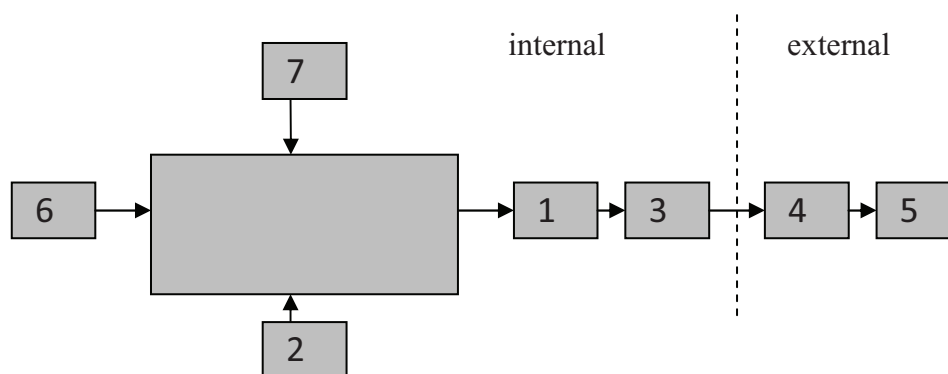
Process is frequently associated with wasting material, energy or human labour. This, however, cannot be a process objective; process objective must always be **meeting the customer requirements**.

Regarding the above-mentioned, process represents a sequence of interconnected and usually integrated activities converting inputs to outputs and bringing some value to customers, both internal and external. A closer definition is that of W. Robson and P. Ullah who defined process as a workflow routing from one person to another, and, in case of complex processes, from one worktray to another. Processes can be defined on any level, yet always with exact determination of the beginning, certain number of steps and clear determination of the end. This definition points at the fact that the activities involved in the process are interconnected, while the limits of activities, i.e. exact determination of the process' beginning and end should be clearly determined.

Following is the definition of M. Hammer (7), where process is “*set of activities requiring one or more input and output forms that are of a certain value to the customer*”. The advantage of this definition is the emphasis on the necessity of satisfying the customer needs via the activities forming the process. In practice, managers of individual organisational structures frequently focus on performing individual process activities, while ignoring the main aim of these activities, i.e. producing an output which will satisfy a customer, both internal and external. This is typical for functional approach.

As shown above, processes are workflows with determined beginnings and endings, i.e. limits. The limits are determined by the process inputs (tangible or information ones) and outputs. When defining the process, it is necessary to consider also the subjects entering the workflow. General definition of the process subjects is shown in Figure 1.

1. Primary customer
2. Secondary customer
3. Indirect customer
4. External customer
5. Consumer
6. Primary supplier
7. Secondary supplier



**Figure 1** Subjects of processes

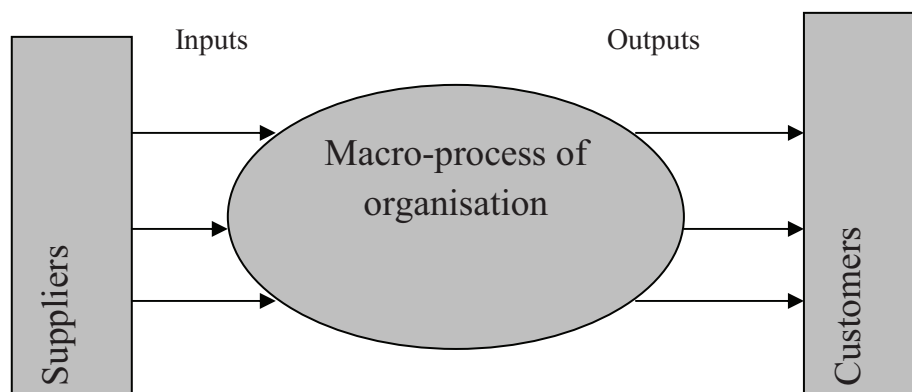
It obviously depends on the fact whether it concerns either internal relations i.e. meeting the needs of internal customer, or external relations.

Limits of each process are formed by primary inputs starting the whole process. As their name shows, primary inputs are delivered by primary suppliers, and they should satisfy a primary customer in the process end. As a certain process starts running, its course requires a sequence of secondary inputs necessary for the implementation of the given process (e.g. information, standards, drawings etc.). There are also secondary outputs, occurring as a by-product of given process (e.g. information again). It is worth to emphasise, however, that the only process aim in economic organisations is customer satisfaction. Generally, there are five kinds of customers, yet not all of them occur in the each process, as shown in Figure 1.

When assessing processes, it is necessary to consider their hierarchy and structure. While process hierarchy concerns the management level, process structure expresses the role of process and its function in the process of meeting the customer's needs.

When dealing with process hierarchy, I focus on the following kinds of processes:  
 macro-process,  
 process,  
 mini-process,  
 micro-process.

This hierarchy differs from the commonly used one using the concepts of process and sub-process. Process hierarchy is important from the aspect of defining the level of management, where the process takes place as well as responsibility for the process implementation. Macro-process is located on the top management level and represents a complex sequence of all processes running in the organisation, starting from acquiring the inputs from suppliers up to the providing outputs to buyers. Macro-process thus represents a whole organisation, and top management, in fact CEO, is therefore responsible for the implementation of a macro-process. Universal macro-process is shown in Figure 2.

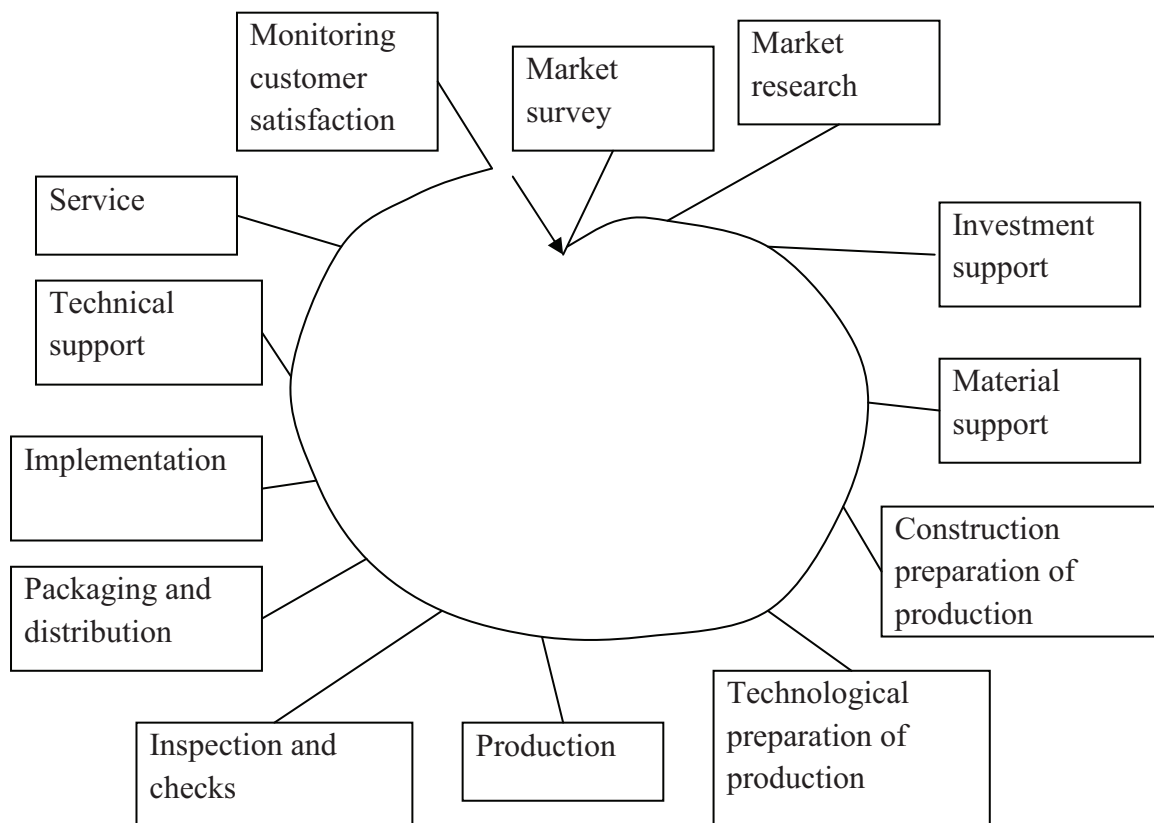


**Figure 2** Universal model of macro-process

As expressed in the title, model of macro-process is universal and applies to all economic organisations. In case of a production organisation, it buys supplies, material and energy from various suppliers, which is followed by a sequence of processes resulting in the outputs delivered to customers. The total of all these activities forms the macro-process of organisation. A universal model for service companies and even for the bodies of governmental and local administration can be similarly expressed.

Quality of output, either a product or service, means the compliance with customer requirements. In order to meet customer demands, the organisation must design and manage its macro-process so that the macro-process' outputs meet the customer requirements. Thus, in order to succeed in the market, manufacturers have to produce the products with the

properties required by customers. That requires the implementation of sequence of processes described and structured by Juran in his **quality spiral**.



**Figure 3** Juran's quality spiral

### Process orientation in marketing

Marketing processes are inseparable components of organisation processes. Typical for marketing are mainly the following ones:

- Decision-making on the basis of facts,
- Customer orientation,
- Beneficial relationships with suppliers.

I can state that marketing processes in organisation are generally focused on market analysis, marketing planning and development of marketing strategy within organisation, sales promotion and communication with customers.

The abovementioned processes also manage marketing research and survey, planning of marketing activities, management of marketing sources and utilisation of related communication tools. Marketing activities thus involve communication with customers in the stage of both, input (communication on requirements) and output (within sales promotion and communication with customers, monitoring customer satisfaction and feedback, i.e. the information flow into the processes connected with the improvement of marketing activities). The organisations classified as medium-sized and large split marketing activities into mini-processes and micro-processes.

Each process, including marketing, must be documented and described, comprising the following items:

Name of process

Identification of previous processes  
Identification of subsequent processes  
Determination of inputs  
Sequence of actions  
Resources (human, financial, information, material)  
Facilities and infrastructure  
Process monitoring and measurement  
Data analysis  
Process documentation, including input documentation  
Records on process improvement.

## **Conclusion**

Combination of process orientation in the field of marketing with the principles of quality management may represent a solid basis for business success. There is a big difference in the way the organisations apply modern marketing ideas; some actively implement marketing procedures and processes, while the others just start realising what marketing can offer within competitive environment. The differences also depend on which aspect of marketing is being preferred under given conditions. The above-mentioned factors generally define certain development phases which may lay the logical foundations for the development of marketing system in an organisation. Quality management is based on the effort to improve. Only intelligently managed marketing processes may bring benefit for organisation.

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# ECO CERTIFICATION OF WOOD FUELS AND ITS CONTRIBUTION TO THE CLIMATE CHANGE MITIGATION

*Slavica Petrovic*

## **Abstract:**

Results presented in this paper<sup>1</sup> are obtained from the analysis of the most important eco certification schemes for wood fuels which apply in Europe. Eco certificates confirm that by using, or combusting wood fuels no gas emissions occur that might have harmful effect on environment. Apart from fuels, the analysis included eco certification of wood fuels burning appliances as well, since their characteristics also impact combustion quality and composition of gas emissions generated in that process. By applying this type of certificates, consumers are enabled to have direct impact on environment protection and climate change mitigation by selecting eco products.

## **Key words:**

Eco certification, wood fuels, wood fuels burning appliances, quality standards

## **1. Introduction**

Over the past several decades, climate changes have become growingly intense, inciting various methods of awareness-raising aimed at the reduction of carbon-dioxide emissions and protection and preservation of the environment. One of the measures that can lead to the accomplishment of this goal is the application of product eco certification. Eco certified products offer better environmental performance than other products in the same category. Eco certification provides benefits both for consumers and the manufacturers as the eco-labels send a message to consumers suggesting them to opt for a product whose usage will not harm the environment, while the manufacturers who use this type of certification can emphasize the advantages of their products compared to the similar merchandise and thus ensure a better market positioning.

Eco-labeled products include wood fuels, more precisely – wood pellets, wood briquettes, and wood chips, whose burning generates significantly lower carbon-dioxide emissions than caused by the burning of solid fuels, especially fossil ones. This property of wood fuels is the most important element for the eco certification process. Namely, wood is considered a CO<sub>2</sub>-neutral material as the amount of carbon-dioxide resulting from the wood burning is used by other trees and absorbed through the process of photosynthesis.

In addition to wood fuels, eco certification covers the burning appliances fired by these fuels, since the usage of eco certified fuels and appliances leads to the lowest gas emission. Apart from the carbon-dioxide and nitrogen oxide emissions, the certification of wood fuel stoves and heating boilers also includes the examination of hydrocarbon and dust emissions.

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<sup>1</sup> The paper is financially supported by the Ministry of Science and Technological Development of the Republic Serbia within the project ref.43007: „Research of climate changes and their environmental impact – monitoring of impacts, adaptation and mitigation“.



## **2. Scope and objective of the paper**

Scope of research in the paper includes the European certifying schemes, i.e. eco-labels used for wood fuels. The analysis primarily covered wood pellets because the research has shown that the greatest number of eco certification schemes in Europe is developed for this type of wood fuel. Also, the research has indicated that there are no eco certification schemes for wood logs, and that the schemes for wood briquettes and wood chips are less frequent than the wood pellet schemes. Besides that, eco certification scheme for wood chips is not significant for the Serbian market as wood chips are not used for heating, while the only European certification scheme of wood briquettes is currently under revision.

The research also included several European quality standards to some extent, since the eco certification of wood pellets is performed in line with the requirements set by these standards. In addition, the analysis covered eco certification schemes for the wood fuels burning appliances, as well as the European standards for the quality of the appliances, as these standards are also necessary for this process.

The objective of the research is to make an overview of the requirements set by the major eco certification schemes for wood pellets used in Europe. Additionally, due to the underdeveloped national market, the biggest portion of Serbian wood pellet production is exported to the EU countries, which is way how our country indirectly contributes to the climate change mitigation.

## **3. Method of work**

The research performed for this paper relied on a special scientific method of analysis applied to the existing European certification schemes for wood fuels and related burning appliances. In that respect, the research covered web sites of European certifying authorities issuing licenses for the usage of eco-labels, state institutes for standardization, as well as the institutions examining the quality of analyzed products.

Apart from the analysis method, methods of synthesis and generalization as specific scientific methods were used. Among general scientific methods, the method of inductive-deductive reasoning was used.

## **4. European standards for eco-labeling**

Ecological (eco) labeling is a voluntary system of certifying the environmental performance of products and services. The awarded eco-label<sup>2</sup> is a symbol confirming that a certain product or service within a service or product category has better environmental performance than the rest of the products/services within the category. Namely, the eco-label identifies the products whose usage has either a less detrimental impact on environment or does not harm the environment at all. Therefore, these eco products are more acceptable for utilization than the other products from the same category lacking such environmental features. The main reasons for introducing eco-labels are the following:

- Promotion of export, production, advertising and utilization of products with less harmful environmental impact;
- Stimulating the production method where the saving of resources is maximized through recycling and

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<sup>2</sup> Eco-label may have the form of a statement, symbol or graphic sign on the product or packaging, user manual (technical documentation), technical report, advertisement or public ad (ISO 14020:2000).

- Provision of reliable data to consumers regarding the environmental impact of the product/service.<sup>3</sup>

The procedure for awarding eco-labels used in Europe and their characteristics are defined by a set of standards of the International Standards Organization – ISO. According to the ISO standardization, there are three types of eco-labels: Type I, Type II, and Type III.

Standard ISO 14024:1999 governs the attributes of Type I labels, standard ISO 14021:1999 governs Type II eco-labels, and standard 14025:2006 governs Type III labels.

Type I eco-label is awarded following the examination of the predefined product performance directly affecting the environment and natural resources. This is the only label type awarded by a certifying authority, which is why it is a very reliable indicator of a product's eco friendly quality.

Type II eco-label is a statement or confirmation of the producer, importer or distributor stating that a certain product has better environmental performance than the other products belonging to the same group. This type of eco-label is commonly used to indicate the following environmental properties of a product: compostable, degradable, designed for disassembly, extended lifespan of a product, recovered energy, recyclable, recycled content, reduced energy consumption, reduced resource use, reduced water consumption, reusable or refillable, waste reduction. According to the ISO 14021 requirements, the person providing the statement must substantiate it with appropriate facts and explanations.

Type III eco-label is used to specify the quantitative information about the product based on the analysis of its life cycle, in order to compare the product with other products having the same function. When this label is awarded, and depending on the product category, the following is examined:

- Product composition, i.e. the type of the material used for the production;
- Consumption of material used for the production, transport and during the product usage;
- Consumption of different types of energy during production, transport and product usage;
- Environmental impact of production, transport and product usage and
- Analysis of waste and emissions to air and water during production, transport and product usage.

## **5. European eco certification schemes for wood fuels**

There are three kinds of Type I eco-labels for wood fuels used in Europe: Nordic „SWAN“, German „Blue Angel“ and Austrian „UZ 38“. Nordic certification scheme is applied only for wood pellets, German scheme is used for wood pellets and wood chips, while the Austrian scheme is used for wood pellets and wood briquettes.

Eco certification of wood fuels is based on the assessment of their compliance with the requirements set by the European standard EN 14961 which refer to the fuel quality and forms of woody biomass utilized for the production of these fuels. In addition, each certification scheme has separate requirements the applicant must comply with in order for his product to be environmentally labeled.

### **5.1. European Eco Certification Schemes for Wood Pellets**

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<sup>3</sup> ISO 14020

All abovementioned eco schemes certify the highest quality of wood pellets intended for small scale burning appliances mostly used in households. The most important requirements of European eco certification schemes for wood pellets are given below.

#### 5.1.1. Nordic eco certification scheme

Nordic eco-label<sup>4</sup> is awarded for wood pellets produced from pure wood, i.e. from the following forms of the woody biomass (classification according to standard EN 14961-1):

- 1.2.1.1. Chemically untreated wood residues from wood processing industry, wood without bark, broadleaf and

- 1.1.2. Forest and plantation wood, stemwood (broadleaf, coniferous, short rotation coppice, bushes and blends and mixtures).

Nordic certification scheme prohibits the usage of wood processing residues that contain adhesive or similar substance in the production of pellets, as well as the chippings from municipal waste. If pellets are produced from virgin wood raw material, 70% of the resources in the annual production must come from certified forests. According to this certification scheme, the production of pellets must not include additives, with the following exceptions:

- Chemically untreated biomass is used;
- The quantity of additives does not exceed 2% w/w; and
- The levels of heavy metals and the halogen content in the pellets with additives are equivalent to those in pure wood.

Even though the certification is performed in line with the requirements of the European standard EN14961-2, the Nordic eco scheme defines special requirements for the wood pellets which are to a certain extent stricter than those specified in the standard. Wood pellets certified according to the Nordic eco scheme have the features as listed in Table 1.

Table 1: Physical Properties of Wood Pellets According to Nordic Eco-Label

Properties	Unit	Requirements
Size class I (EN D06)		
Length <sup>1</sup>	mm	max 5 × Ø
Diameter		≤ 6 ± 0.5
Size class II (EN D08)		
Length <sup>1</sup>	mm	max 5 × Ø
Diameter		≤ 8 ± 0.5
Bulk density	kg/m <sup>3</sup>	a) 630 < x ≤ 700 b) 700 < x ≤ 780
Fines content < 3,15 mm	% by weight	≤ 1
Mechanical durability	% by weight	≥ 97.5
Energy density	MJ/kg kWh/kg	≥ 17.1 ≥ 4.75
Moisture content	% by weight	≤ 10.0
Ash content of dry matter	% by weight	≤ 0.5
Ash melting behavior	°C	IT ≥ 1.300 HT ≥ 1.400
Sulphur content	% by weight	≤ 0.04
Chlorine content	% by weight	≤ 0.02
Nitrogen content	% by weight	≤ 0.3
<sup>1</sup> A maximum 20% (w/w) of pellets may have a length of 7,5 × Ø.		

<sup>4</sup> Nordic eco certification scheme was adopted in 1989, and it is awarded to the total of 63 groups of products and services, including wood fuels and wood fuel burning appliances. This certification scheme is mostly used in the Nordic countries, i.e. Norway, Sweden, Denmark, Finland and Iceland.

A producer of wood pellets applying for the Nordic eco-label must calculate the average annual consumption of energy for the production of one ton of pellets. According to the certification requirements, the maximum allowed energy consumption is 1.200 kWh per ton of produced pellets.<sup>5</sup> Apart from producers, exporters and resellers can apply for the certification.

Each delivery of certified wood pellets is accompanied by the documentation specifying the values of certain properties in accordance with the Nordic eco-label or if the pellets are packaged in bags, the properties are indicated on the packaging. When the eco-label is used on a certified product or the related documents, in addition to the green logo with the swan image, there is always a six-digit number of the license approving the usage of this label (Figure 1).

Certification scheme stipulates that the material used for the packaging of pellets must not contain chlorine-based plastic.

The current criteria used for the certification of wood pellets for the Nordic eco-label (version 2.0) were adopted in December 2007 and are valid until December 31, 2012. However, in 2011 the validity period of these criteria (Version 2.1) was extended until December 31, 2014. The licenses awarding the eco-label are valid as long as certain criteria are in force. After the validity period, the criteria may be extended or replaced by new ones. If the validity period of the criteria is extended, it is not necessary to issue a new license since the old license is automatically extended. But if the new requirements are laid down, a new license should be applied for.<sup>6</sup>


For the future version of criteria for the Nordic eco certification of wood pellets, the authorities are analyzing the possibility of reducing the maximum allowed values of the energy consumption per ton of produced wood pellets to 900kWh, as well as laying down new requirements regarding:

- The ratio of calorific value of the produced pellets to the energy utilized for the production;
- The emission of gases resulting from wood pellets burning;
- Introduction of water absorbers as parameters for quality assessment; and
- Expanding the certification system to include wood briquettes.

### 5.1.2. German Eco Certification Scheme

According to the German eco certification scheme<sup>7</sup> for the production of wood pellets, the following form of woody biomass may be used (classification in accordance with the standard DIN EN 14961-1):

**An ecolabelled product**



578007

Manufacturer: .....

Diameter:  6 mm       8 mm

Density:   $630 < X \leq 700 \text{ kg/m}^3$   
  $700 < X \leq 780 \text{ kg/m}^3$

Calorific value: ..... MJ/kg

Ash content of dry matter:  $\leq 5 \text{ weight } \%$

Moisture content:  $\leq 9 \text{ weight } \%$

Raw material information: .....

Carrier: .....

Figure 1: Information about Nordic eco certified wood pellets

<sup>5</sup> Total energy consumption includes the energy used for: barking, chipping, drying, grinding, boiling, pressing, cooling and screening and any intermediate stages such as electricity consumption for conveyor belts.

<sup>6</sup> Source: Regulations for the Nordic Eco-labelling of products, June 2011

<sup>7</sup> German eco certification scheme was introduced in 1978, and wood fuels and wood fuel burning appliances are among 120 categories of products it is awarded to. Licenses for the usage of German eco-label are issued by

- 1.1.1. Whole trees without root (except for Class 1.1.1.3. – short rotation coppice, if there is reason to believe that the soil has been contaminated, the cultivated area has been used for storing chemicals or if the woody biomass has been treated using sewage sludge as a fertilizer);
- 1.1.3. Stemwood;
- 1.1.4.3. Logging residues, dry, broadleaf; and
- 1.2.1. Chemically untreated wood residues.<sup>8</sup>

If forest trees are used for the production of wood pellets, the trees must come from the certified forest, which is confirmed in the application for certification by relevant certificates (FSC or PEFC). Wood pellets certified according to the German scheme have the properties in compliance with the requirements set by the standard DIN EN 14961-2 (Table 2).<sup>9</sup>

Table 2: Properties of Wood Pellets According to the German Certification Scheme

Properties	Unit	Requirements
Diameter, D <sup>a</sup> and Length L <sup>b</sup>	mm	D06, 6±1 mm; 3.15≤L≤40 D08, 8±1 mm; 3.15≤L≤40
Moisture	w-% wet basis	≤ 10
Ash	w-% dry	≤ 0.7
Mechanical durability	w-%	≥ 97.5
Fines content	w-%	≤ 1.0
Additives	w-% dry	≤ 2 (Type and amount to be stated)
Net calorific value	MJ/kg kWh/kg	16.5 ≤ Q ≤ 19 4.6 ≤ Q ≤ 5.3
Bulk density	kg/m <sup>3</sup>	≥ 600
Nitrogen	w-% dry	≤ 0.3
Sulphur	w-% dry	≤ 0.03
Chlorine	w-% dry	≤ 0.02
<sup>a</sup> Selected size of pellets to be stated.		
<sup>b</sup> Amount of pellets longer than 40 mm can be 1 w-%. Maximum length shall be < 45 mm.		

The German eco label can be awarded to the producers and distributors of wood pellets. According to the certification requirements, it is necessary to determine the CO<sub>2</sub> emission generated during the transport of resources for production of wood pellets if they are shipped from remote areas, as well as during the export of produced pellets to other countries. The calculation of CO<sub>2</sub> emission is performed according to the following formula:

$$\text{CO}_2 \text{ (kg CO}_2\text{e/t of cargo) = } \frac{(\text{EF CO}_2 \text{ truck} \times \text{km} + \text{EF CO}_2 \text{ railway} \times \text{km} + \text{EF CO}_2 \text{ oceangoing vessel or barge} \times \text{km})}{1000}$$

Where:

kg CO<sub>2</sub>e - kilograms of carbon-dioxide-equivalents: emissions based on the global warming potential of CO<sub>2</sub>;

EF – emission factor depending on the used transport and destination.<sup>10</sup>

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the agency RAL gGmbH which is the authorized body by Federal Environmental Agency for the award of the Blue Angel.

<sup>8</sup> Fof the certification process, the manufacturer of wood pellets must document the origin of chemically untreated wood residues.

<sup>9</sup> Source: Certification Scheme for Wood pellets for use in small furnaces in accordance with DIN EN 14961-2

<sup>10</sup> Source: RAL-UZ 153



According to the certification requirements, the raw material used for the production of wood pellets must be dried with heat energy produced from the renewable sources. In addition, it is required that the utilization of energy during the drying process is efficient, i.e. that the quotient of the used heat energy and the amount of water that evaporated is lower than or equal to  $2.5 \times 2.441 \text{ MJ/kg}$ .<sup>11</sup>

Certified wood pellets bear the logo of the German eco-label indicating that the usage of these products is beneficial for the climate (Figure 2).<sup>12</sup>



Figure 2: German eco-label for wood pellets

The documentation or packaging of the eco certified wood pellets must contain the following information:

- Minimal calorific value in kWh/kg and minimal bulk density in  $\text{kg/m}^3$  so that a consumer can calculate the total energy and determine the amount of pellets needed for heating;
- Information on  $\text{CO}_2$  emission resulting from the delivery of resources, or if the pellets are sold abroad, also the emission generated during their export to other countries; in addition, the place of wood pellets production must be indicated;
- Notification that the pellets have the properties of A1 class of the DIN EN 14961-2 standard;
- Information regarding suitable storage and appropriate burning appliances;
- Identification number of each delivery and the accompanying documentation must indicate the producer's headquarters, and if the producer and supplier are different entities, the documentation must contain the relevant data about the supplier (company name, driver, license plate number). This is not applicable for the pellets delivered in packages.

The criteria used for the issuance of German eco-label for wood pellets came into force in January 2011 and are valid until December 31, 2014. The right to use the label is awarded for a one-year period, with the possibility of extension. The annual fee for the usage of the label depends on the company's total annual sales of the respective Blue Angel-labelled products.

### 5.1.3. Austrian Eco Certification Scheme

Austrian eco-label<sup>13</sup> is awarded for the pellets made of pure wood where at least 70% of wood, wood fibers or wood chips used for the production of pellets must come from the forest managed in a sustainable manner. The production of pellets must not include the usage of particleboard and fiberboards, or the surface processed, impregnated or chemically treated wood. Additives are allowed if they are of bio-renewable origin and permanent chemical composition, and their quantity must be maximum 2% of the mass. The certification scheme does not allow the usage of plastic containing halogenated components for the packaging of wood pellets.



Figure 3: Austrian eco label on a package of wood pellets (www.rz-pellets.at)

By acquiring the eco certification, a manufacturer obtains

<sup>11</sup> Evaporation heat of water at  $25^\circ\text{C} = 2.441 \text{ MJ/kg}$  of water.

<sup>12</sup> German eco-label consists of three elements: the first one is the UN symbol in the form of a blue ring with the laurel wreath and a human figure in the middle, the second element is the text written around the center circle indicating the main environmental properties of the product bearing the label, the third element shows which part of nature the certified product affects (environment and health, climate, water or resources).

<sup>13</sup> Eco certification in Austria was introduced in 1990, and it is awarded for different types of products and services in tourism and education.



the right to put the Austrian eco-label on the package of wood pellets together with the number of the license granting the right to use the sign (Figure 3).

The examinations carried out for the purpose of awarding this sign are in compliance with the national standard for the quality of wood pellets - ÖNORM 7135.<sup>14</sup> For the end beneficiaries to receive highest quality pellets, in addition to meeting the requirements during the production process, the wood pellets must maintain the same quality during transport and storage. In that respect, the certification requires the application of national standards ÖNORM 7136 and ÖNORM 7137 that specify the requirements for pellet transport and storage.

## **6. European Eco Certification Schemes for Wood Fuel Burning Appliances**

Apart from the wood fuels, the Nordic, German and Austrian eco-labels are awarded for heating boilers and stoves fired by wood fuels. The Nordic eco-label is awarded for heating boilers fired by all types of wood fuels with an output of up to 300 kW, German eco-label is granted only to heating boilers using wood pellets and wood chips with an output of up to 50kW, while the Austrian label is granted to heating boilers using all types of wood fuels with an output of up to 400kW. In addition, the Nordic eco label is awarded to stoves fired by wood pellets and wood logs, the German label is granted only to wood pellet stoves with an output of up to 15kW, while the Austrian label is designated for the wood pellets and wood logs stoves, cookers and fireplaces.

During the process of eco certification of the wood fuel burning appliances, the examination is focused on the emission of burning-generated gases (the content of CO, NO<sub>x</sub>, CO<sub>2</sub> and dust), as well as the energy efficiency achieved by the appliances. Standards specifying the requirements for the production of wood fuel burning appliances (EN 303-5, EN14785, EN 13240) lay down high values of gas emissions, but low values of energy efficiency, which is why the eco certification schemes specify stricter requirements for the emission and efficiency.<sup>15</sup> The strictest requirements for eco certification are set by the German scheme.

In addition to the above, the Nordic certification scheme is based on the analysis of the materials used for the production of heating boilers and stoves, the products used for the surface processing, as well as the recycling capacity of the material used for packaging. According to the requirements of the Nordic eco-label, the products used for the surface processing of heating boilers and stoves must not contain lead, cadmium, chrome, and mercury-based pigments. Also, packaging material used for heating boilers must not be made of plastic containing chlorine and biocide treated wood.

All the certification schemes recommend that the eco certified stoves and heating boilers use eco certified wood fuels to facilitate minimum gas emission and maximum energy efficiency.

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<sup>14</sup> The Austrian eco certification scheme is under revision due to the replacement of the national standard for this type of fuel - ÖNORM 7135 with the new European standard EN 14961-2.

<sup>15</sup> The certification for all the abovementioned eco-labels requires that the heating boilers are produced in line with the requirements of the standard EN 303-5(1999): Heating boilers - Part 5: Heating boilers for solid fuels, hand and automatically stocked, nominal heat output of up to 300 kW, pellet stoves in line with the requirements of the standard EN 14785(2006): Residential space heating appliances fired by wood pellets, and wood logs stoves in accordance with the standard EN 13240(2001): Room heaters fired by solid fuel.

## 7. Conclusion

Ecological (eco) labeling is a voluntary system of certifying the environmental performance of products and services. Eco-labels on products send a message to consumers suggesting them to opt for a product whose usage does not have a harmful effect on the environment. According to ISO standardization, there are three types of eco-labels, but the most important eco-label for consumers is Type I environmental label awarded by the certifying authority, which is why it is a very reliable indicator of a product's environmental performance.

There are three eco certification schemes for wood fuels used in Europe - Nordic, German and Austrian. The analysis primarily covered wood pellets because the research has shown that the greatest number of eco certification schemes in Europe is developed for this type of fuel. Apart from wood fuels, the mentioned schemes are also used for eco certification of wood fuels burning appliances – stoves and heating boilers.

For the certification of wood pellets according to the above schemes the compliance of the pellet quality with the requirements of the European standard EN 14961-2 is examined. The main requirement of eco certification is that wood pellets are produced from pure wood, i.e. that they are not manufactured from the chemically treated wood containing adhesive material or certain products for surface processing. The certification process set out by the mentioned schemes is performed only for the top quality wood pellets (A1 quality class) as stipulated by the European standard EN14961-2.

In addition to the assessment of compliance with the above standard, certification schemes also set out certain requirements which refer to the examination of carbon-dioxide emission generated by the production of wood pellets, or by their transport for the export to other countries.

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# COMMUNICATION TOOLS IN MARKETING OF PUBLISHING HOUSE OF CORPORATE PERIODICAL

*Hana Pravdová*

## **Abstract:**

The aim of the study is to point out some aspects of using communication tools in marketing of a publishing house producing a corporate periodical in the field of woodworking industry and entrepreneurship in this environment. The author defines and analyzes the issue of a product which is characterized as a specific commodity on media market. In the focus of attention there is the implementation of communication tools and the production of promotional mix in marketing of the corporate periodical's publishing house.

## **Key words:**

publishing house, corporate periodical, product, title, issue, promotional mix, advertising

## **Introduction**

In terms of the target groups, corporate periodicals belong to well-proven and direct communication tools. They are, in fact, popular among readers and have a significant impact in shaping both in-house and public opinion. Throughout nearly two hundred years of their existence, they have undergone various changes and approaches by management, organization of editorial work and editorial system, as well as the review of content structure evaluation. The corporate periodicals have changed their roles as well – they have been no longer serving the management as its stage, but they have been trying to reach mutual communication between themselves and ordinary employees. The establishment of such agenda is their new message. This agenda should respond to readers, i.e. it should create positive feedback from the readers.

The corporate periodicals bring new information to workers, whereas indirectly benefiting from the inside of corporate operation. It is mostly the mediation of more secret and professional information. They evoke the binding sense of belonging in employees, loyalty to corporate entity and interest to participate in various activities.

This can have a positive impact on support of their more active approaches and solving some organizational, communication, as well as technological problems. This is the way how informing and dialogue can enhance the motivation, responsibility, outputs, creativity of workers, or facilitate their adaptation to some new conditions.

An effective, a two-way communication via business periodicals, creates good level of mutual relations by referring the message of top management to staff members. Its main idea sounds as follows: we do care about your information, we are interested in your ideas, attitudes, and work and therefore we want to communicate with you. This simple message has great importance for each employee's motivation - it refers her/him that the company respects her/him and is interested in her/his work and views.

## Product specifications - corporate periodicals published by company

There are four basic types of corporate periodicals in current practice, dealing with the issue of wood products and woodworking:

a) *Newsletter* is designed for some specific structures of workers, i.e. - machine technicians, woodworking professions, sales of commodities etc.

b) *Company news* is intended primarily for internal staff, as well as existing or potential business partners. In addition to some important information (e.g. upcoming decisions of top management), they also consist of short news services, mapping the current company events, as well as various attractions of corporate life of employees (organizational changes, changes in product strategy - processing technology and wood products).

c) *House journal* brings, in addition to some reposting units, some journalistic genres as well - comments, notes, analyses, reflections, surveys, glosses, reports, essays. It is usually coloured, having wider range, superior paper, more photos, and mainly finished wood products. In terms of current business practice, some magazines, designed for two target groups are published: for internal workers and for business partners - clients.

d) *Wall newspaper* is considered to be a very practical means of informing. It does require neither high costs, nor any organizationally demanding editorial work. In many cases, we can talk more about the newsletter (not based on regular basis); usually located in a small space, through which, the larger number of employees passes by (canteen, cafeteria, entrance hall etc.).

The large companies can afford several business periodicals to be issued at the same time to achieve the most effective communication - e.g. flyer, corporate newspaper for employees and corporate magazine designed for clients.

The issue of multiple titles depends on financial possibilities of a company. It is subject to some communication needs as well as some business and manufacturing or business priorities and goals. The business journals often contain the same information as regional or national press.

The corporate scene information prevails, because the employee is made aware mainly of some company events, changes at individual positions within the management hierarchy, about various decisions, regulations or future direction of company, its investment plans etc. The staff members have the opportunity to become familiar with people in various management positions; there are the profiles of their colleagues or their interviews, creating positive relationship not only to the company, but to the journal itself.

A very important factor, involved in the construction of some attitudes, high readership, creates a positive image of periodicals. It is perceived as trustworthy, information saturated source by the readers. It is the space for their views to be published as well. The positive image is an important factor, influencing the popularity, rating and view creating of some corporate periodicals. It is necessary to consider the image as an created idea and view, dealing with the whole journal - its content, graphics, authors, as well as the institution - the company it is funded, organized and published by.

The image of each periodical is created by each reader itself, by self evaluation and evaluation of immediate environments, based on several considerations and criteria:

From internal workers point of view, terms as follows - respectability, credibility, tradition, dynamic, flexibility, ambition, availability, quality, usefulness, sense of community and friendliness.

In terms of trading partners and wider public, we can talk more about such criteria as - design, socio-cultural orientation, macro-social utility, attractiveness, as well as some aesthetic, information, genre and professional quality.

As already indicated, the publishing product has some specific character. Typologically diverse newspapers and magazines is the product of publishing periodicals.

They can be defined as distinctive entities, having some specific material and contextual characteristics, bringing the same benefits for the target groups – new information, lesson, enjoyment of reading, fun etc. They are materialized to newspaper or magazine paper. This paper is used for mediation of various information, contents and messages by means of some journalistic and non-journalistic genres and formation of visual material as well.

People with some specific professions in various publishing department, mainly in the editorial department, are involved in its development and production.

M. Foret divides the product as follows: core product, own product and extended product.<sup>1</sup>

The core product is created by some exact, materialized product – what we buy and consume in various ways (e.g. newspapers, magazines for gardeners, hunters, movie lovers, popular music, company newspapers and magazines). Own product – involves five characteristic features: quality, realization, style and its parent design, brand and packaging (in terms of quality, it might be the selection of topics suitable for publication, its portrayal by means of some adequate journalistic genres, implementation is seen as the whole complex of activities - writing process, redaction, printing and distribution, design represents the choice and level of graphical strategy, choice and level are closely connected to graphics, focusing on front page - „newspaper showcasing, “ brand is meant by its public image, as well as the author’s base).

Extended product - offers another so called additional products, services, profiles, advantages for the customers to core product (might be some special enclosures - conditions for submissions of applications to individual universities etc., included film DVD, music CD, bonuses for subscribers, etc.).

J. Matúš, L. Čábyová and K. Ďurková mention parameters of division and characterisation of a product. According to them, in media marketing it is necessary to take into account the division of the market into consumer and advertising markets. From this aspect they distinguish two main views on understanding and defining the product. Under the term “product” they understand certain content and simultaneously advertising space.<sup>2</sup>

In publishing of the periodical press this concept has clear identification:

- Product as program – they distinguish three main levels of a product: a) basic layer says about the reason why target groups read certain magazine, certain newspaper; b) middle layer is set by the level, quality, design of the issue; c) outer layer mentions what advantages reception of content of a concrete issue of newspaper provides to the readers.

- Product as advertising space – the publisher may use more possibilities on promotion of their products, like e.g. advertising spot, sponsorship, product placement (installation of a wood product into a film scene etc.) advertising interview, PR article on ecology of wood products etc.

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<sup>1</sup> FORET, M.: Marketing communications. Brno: Computer Press, 2006. p.169.

<sup>2</sup> MATUŠ, J., ČÁBYOVÁ, L., ĎURKOVÁ, K.: Marketing - the foundations and tools. Trnava Faculty of Mass Media Communication, UCM, 2008. pp 239-240.



Characteristics and success of a corporate periodical depends also on other determinants and factors, like e.g. – philosophy of the periodical (I address internal employees, business clients, broader clientele – advertising partners, customers and so on); specification of target group of readers; quality of contents; authority; reputation or popularity of authorial basis; informational attractiveness – yield capacity, thematic orientation, concrete form of proof of a periodical, preferred style of writing, graphic design.

## **Specifics of promotional mix in publishing house**

The main aim of marketing communication of a publishing house of corporate periodical with the orientation on woodworking industry is to influence behaviour of target groups of readers (employees, business partners, clients). Methods to assert desires and expectations represent miscellaneous communication forms, implemented in the concept of promotional mix, leading to concrete promotional targets and effects. According to R. John „promotional mix, previously called by the term promotion, is a set of tools, which will get the name and image of organisation into awareness of customers. Promotional mix consists of advertising, sales promotion, public relations and direct marketing“ (JOHN 2008, p. 196). The task of such communication with both external and internal environments is to inform, to make target groups read the corporate periodical. An important role in this process is played by realization of the advantage, which results from being different. By creating image of the title which the publisher wants to promote among target groups there applies the principle of diversification from the competitors. Just out of this reason, promotional or advertising logo needs to become a motivation source at decision-making of customers about buying the title of certain periodical.

The assumption is suitable choice of slogans, comprehensible way of information providing and clear graphic symbols, which help to decipher the content and at the same time to promote both the company and the title. Therefore, marketing communication may be denoted as art to communicate, to create concepts and strategies with the aim to build trust and sympathy between publisher and their environments: readers, authors, services suppliers, distributors, banks, media, public institutions etc. Ľ. Čábyová strengthens that “authors of an effective promotional campaign have to know answers to basic questions regarding setting the targets, budget, expectations from the promotional mix, which target group should be addressed and what important should customer keep from the campaign.”<sup>3</sup>

In this context, R. John delimits basic questions, which need to be answered in order to make marketing campaign successful: what to say (content of message), whom to say it (target groups), how to say it (structure of message), how to encode it into symbols (format of message), how often to say it (amount of repetitions), who will say it (choice of media) and to know why we are saying it.

Creating positive image of publishing house, editorial staff and a title is an important factor, which conditions the way how readers perceive and evaluate publishing house, editorial staff, or product – corporate periodical. From this viewpoint, we may delimit fundamental tasks of marketing communication: a) forming opinions on publishing house, editorial staff and title by business partners and readers; b) arousing interest and building positive image; c) support in launching new title; d) change of image of the old title; e) defence of such titles, which face certain problems (mainly opinions of readers). Authors comply in the fact that especially advertising has an irreplaceable position, because it informs and influences – deliberately, casually, or by means of presentation of goods and services.

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<sup>3</sup> ČÁBYOVÁ, Ľ.: Benchmarkingové comparison of marketing communications. Trnava: Faculty of Mass Media Communication, 2009. p. 43.

„Advertising has the ability to influence origin and change of needs, demands, but also interests, customs, traditions. Its importance in society is approved by amount of annual expenditures, which continuously grow.“<sup>4</sup>

J. Matúš strengthens that also media institutions „are focused especially on profit, which is but dependent on satisfaction of customers and quality of media products, but also on advertising, due to the fact that all media business depends on advertising. For example costs on production of dailies are from 30 to 60 % on average.“<sup>5</sup>

In publishing practice there are distinguished four forms of advertising: advertising promoting publishing house, advertising promoting product/title, advertising focused on an event (combined with Public relations), and advertising focused on target groups, whose task is to gain mainly subscribers. Advantage of advertising is its speed; a marketer has control over the content of the message, choice of media and time of publishing. Disadvantage of advertising is especially its price in other media, mainly in electronic ones. Sales promotion consists of short-term special offers in the sales outlets, or providing services in the market. It involves consumer contests, games, lotteries, rewards and gifts, samples, various discount offers, bonuses, annual activities, copies provided in public areas, various forms of contests, courses.

A Public relations (PR) is the second important tool of promotional mix of the publishing house of a corporate periodical. Here we mean a set of programmes, designed to improve, to maintain and to protect publishing house. Here belong articles in the press, arranging seminars, conferences, media partnerships, lobbying, presentations in media, open journalistic letters, public festivals, events, celebrations. The aim of Public relations is to form public opinion and to gain, or to strengthen trust by means of keeping relationships with the public. The main roles of PR in a publishing house are as follows: creating identity of the publishing house, purpose-built campaigns, crisis communication, lobbying, information on products/titles, sponsorship.

An important role of PR in a campaign of the publishing house is played by creating publicity of a corporate periodical. „Even though there exists overlapping between publicity and PR, it is important to distinguish these activities. PR is communication endeavour of a strategic image building. Publicity is the main tactic means of implementation of this strategy“<sup>6</sup>.

To the most important communication tools of PR in the publishing house belong following ones:

- charity events, media partnerships, presentations at various cultural-social events,
- sponsorship or media promotion of miscellaneous cultural-social events,
- informational policy on own products in relation to media environment,
- lobbying in relation to external environment,
- building positive relationships with the general public by means of events, charity activities, media partnerships etc.
- arranging seminars, interviews with the authors, with important personalities of social, political, cultural and sports life,

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<sup>4</sup> LABSKÁ, H., TAJTÁKOVÁ, M., FORET, M.: Principles of marketing communications. Bratislava. Bratislava School of Law, 2009. p. 28.

<sup>5</sup> MATÚŠ, J.: Selected problems of contemporary marketing. Trnava Faculty of Mass Media Communication UCM, 2007. p. 5.

<sup>6</sup> LABSKÁ, H., TAJTÁKOVÁ, M., FORET, M.: Principles of marketing communications. Bratislava. Bratislava School of Law, 2009. p. 90.

- gaining prizes on the basis of reciprocity with entrepreneurial environment,
- projecting, arranging and realization of various types of readers' contests.

The publisher addresses a concrete individual through direct marketing by means of mail or new technologies (mailing, telemarketing and teleshopping, electronic purchasing, sending desired information into e-mail and fax, telephone interviews, letters of readers, newsmen). It enables the marketer in the publishing house to make more precise and more targeted selection of potential readers according to various criteria. „The result is higher attention towards materials of direct marketing, as they get to more interested potential customers. Using direct marketing in practice is always bound to individual functions and techniques of promotional mix, however, they may sometimes merge or overlap: advertising, mail order, mailing, maintaining good relationships with the customers, marketing polls, arranging contests and social activities and so on.“<sup>7</sup>

Publishing house may obtain a list of names of any target group. Communication message may then be adjusted – on the basis of concrete information on the selected target group – to its specific needs (for example addressing with a letter, in which publisher offers and explains to the reader the offer of the firm production, or possible services.)

## Conclusion

The importance of conception of promotional mix of a publishing house plays a key role in the creation of not only goodwill of a corporate periodical, but also of the company as such. Without exaggeration and hype we may state that whole editorial staff – from the editor-in-chief, through specialized editor, up to sub-editor may obtain such position, which will be symbolically comparable with individual positions of top-management. This – at first sight rather courageous statement – results from several generally known facts:

- Building positive image of a corporate periodical is a decisive factor at building trust of readers to mediated information. Building trust to the content is secondarily connected with its information holder – with the editor (but indirectly also with corporate board – in case of news about its decisions or by introducing profiles of new key managers). Individual journalistic units and their contents are personified in this way; it means they are identified with their authors. Thus, the author becomes opinion authority, as their name is connected with concrete ideas, facts, events, but also strategy, corporate philosophy, and various decisions of corporate managers.

Building positive relationships of readers to a corporate periodical also happens by means of other factors' influences:

1) On the basis of own judgement and interpretation of read information, its negative or positive responses („it is good news; I think it is good news for the company; it is nonsense; I have not gained anything; it is bad news; if only the editor was more concrete; I have got chaos out of it in my head“).

2) On the basis of contact with the author – editor, who has influence especially on emotions and feelings of readers („s/he is pleasant; s/he is not pleasant to me; s/he does not look trustworthy – s/he is ragged; smells after onion, alcohol, tobacco; s/he is trustworthy – s/he looks friendly; s/he is interested in me in an unobtrusive way; s/he is smartly dressed, shaved; she has inconspicuous, but interesting haircut; s/he does not have good verbal

<sup>7</sup> LABSKÁ, H., TAJTÁKOVÁ, M., FORET, M.: Principles of marketing communications. Bratislava. Bratislava School of Law, 2009. p.119.

performance; s/he is not polite; s/he behaves like „a king“; s/he is arrogant; with good verbal performance; s/he is polite, decent, quick, clever, etc.“)

3) Relation of readership to the corporate periodical is also created on the basis of identification of editors with the top management. For example, in the framework of marketing communication it happens by means of various charity activities, media partnerships, presentations at cultural-social events, sponsorship, lobbying in important institutions, arranging seminars, sports events, etc. These actions are usually very well popularised by means of corporate periodicals. Therefore, readers justly believe that there are common interests between editorial team and corporate board.

It results from the above mentioned that building positive image of a corporate periodical is not only a matter of production of quality content. It also reaches the sphere of communication with internal and external environments, whereas an important role is played by personification of information, i.e. its connection to the authors. These are perceived by readers as a component of managing structures in existing corporate hierarchies. Creation of newspaper texts, individual copies of corporate periodicals, their asserting on the market – these all are results of synergy of notions and skills from the sphere of journalistic production, as well as from marketing of a company and a publishing house.

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# PRODUCTION PLANNING AND ITS IMPORTANCE WITHIN THE WHOLE MANAGERIAL PROCESS

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## Abstract:

Transformation process is the most effective when it runs under optimal costs, under optimal amount of consumed inputs and by spending optimal time. It must be chosen suitable decision making, monitoring and calculating methods which allow to quantify and to compare particular alternatives and to choose the best one. All these above mentioned is very topical just now, in the time of financial and economic crisis.

## Key words:

production, decision making, process of planning, quantitative and qualitative tools

## Production as a process

Production can be characterised as a system with inputs and outputs. In the system, there are transformed inputs into outputs by the application of suitable technology, organizational and managerial processes. Feedback represents possible corrections in outputs, technology, managerial decisions and inputs choice. It is a reaction on customers complaints and demand and it must result in appropriate solutions and decisions made (Fig. 1).

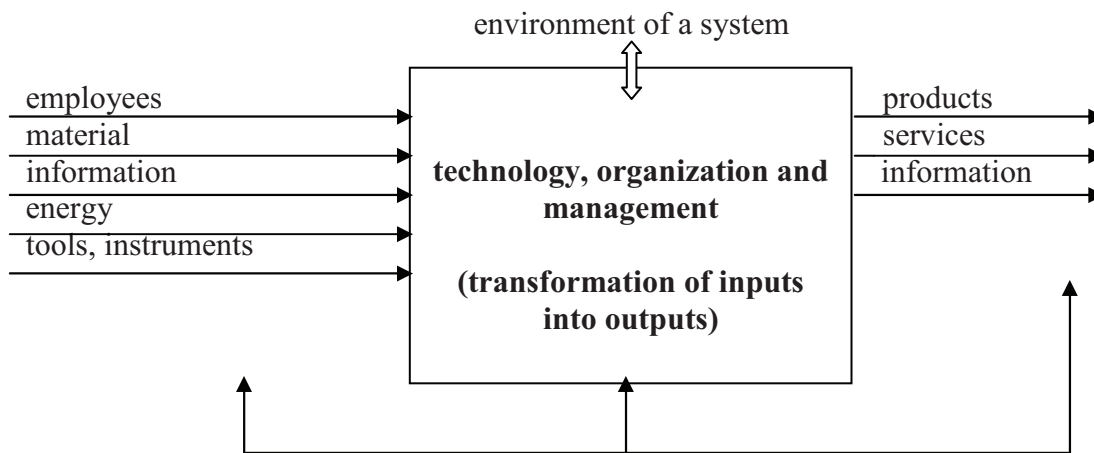


Fig. 1: Production as a system

A goal of production is not whatever product or service but only such one which will be successfully realised in the market, which satisfies customer's demands and which brings adequate (optimal) profit and market share. Transformation process should be the most effective as it runs under optimal costs and under optimal consumption of inputs. Each component must be precisely specified and characterised in order to choose the most suitable for particular type of production and for determined goals.

### ***What impacts production?***

There are several criterions which have decisive impact on each production process.

For the specification of production type it is necessary to evaluate:

- universal character of machinery
- amount of producing products for particular time period
- number of products types
- demands for employees' qualification
- time of production cycle (process)
- character of labour division etc.

### **Planning as a managerial activity**

Planning can be considered as one of the oldest human activities and mentioned as one of the basic and the most important managerial activity which allows to define company's goals and activities leading to meet these goals.

According to company's departments we can speak about: production planning (or plans), personal planning, investment planning, R&D planning, marketing planning, financial planning etc. Fig. 2 describes basic functions of management by classics – Taylor and Fayol.

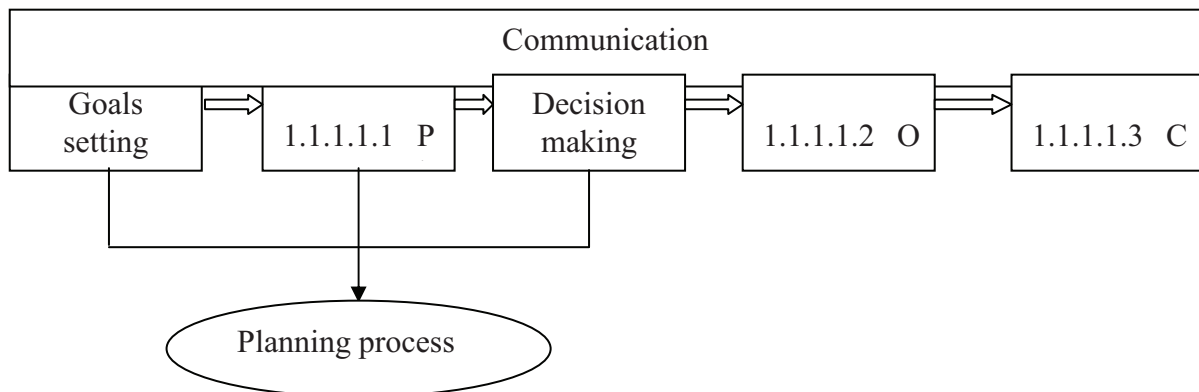


Fig. 2: Managerial functions and specification of planning process

The planning includes goals definition and determining appropriate methods to achieve specified goals. The necessity of planning follows from the nature of organizations as goal-seeking subjects. When we want to create plans we need various information from the environment, from the market and also from the inside of particular company. More detailed and latest information mean more accurate plans and goals.

Some interesting ideas about planning:

- planning is not a description of that what will happen but that what we want to happen
- those who do not plan never will know where they failed
- probability of accidental events is higher when planning process is only general and not concrete, but at the same time...
- ...when the planning is too detailed and exact, impact of accidental events is less expected
- planning process should be only such detailed as it is necessary and not as it is possible.



Content of planning process relates not only on departments where the planning is done but also on specified goals which must be met. Each activity, each process should run under optimal costs, it should be finished on demanded time and desired quality must be reached. So, plans should follow some particular managerial objectives:

1. customer satisfaction: profits and growth depend on meeting customer's demands. Product must be built according to customers specification, taking into account qualitative standards, it must be delivered to him at promised time and in agreed price.
2. continual material flow: costs and time of production rise if planned production schedules are interrupted for lack of materials, employees or for any other reason.
3. optimum inventory levels: the minimum inventory levels to assure continuous material flow may not be the most economic levels. When purchased order quantities increase (demand factors and lead times remaining unchanged), ordering costs are decreased but inventory cost are increased. When ordering costs decrease more than inventory costs increase, optimum inventory level will rise.
4. increased productivity: working process must be so planned and controlled that production time and costs will be held at or below predetermined limits (levels). Productivity can be increased by shortening production times or by increased volumes of semi-products.

### **8 steps of planning process**

Generally and very briefly we can say that planning process estimates - what should be done, in what sequence and under which costs. Depth and details of planning depend on concrete planned situation, on its complexity and scale. But each planning process should contain 8 basic steps:

#### **1<sup>st</sup> step – what is a goal of planning process?; what, why and how should be reached?**

- Precisely defined goals and strategy leading to its reaching are two basic steps which determine success of each planning process. If responsible managers or employees do not find relevant and adequate answers on the above mentioned questions (what, why, how?) it is necessary to reevaluate assessed goals and strategy.

#### **2<sup>nd</sup> step – what must be done?**

- In this step must be identified and specified (characterized) all activities (for example by brainstorming method). Then these activities must be arranged in logical sequence – e.g. according to technology line or material flow. Last but not least, it must be taken into account relationship among activities.

#### **3<sup>rd</sup> step – who will perform (realise) given activities?**

- This step contains planning and definition of functions, description of job tasks for particular employees. Each activity must be bound with an employee (or technology device) who will be responsible for its performance.

#### **4<sup>th</sup> step – who and for what will be responsible?**

- Each employee should be competent and responsible for his/her performance. These competences and responsibilities can be transparently presented in so called matrix of responsibility.

### **5<sup>th</sup> step – when will particular activities be realized?**

- In this phase of planning process all activities should be arranged according to logic sequence and relationships. It is also assigned time required for its performance and then it is elaborated time plan.

### **6<sup>th</sup> step – which costs and resources are demanded?**

- For each activity it should be planned appropriate costs and resources. Amounts of costs and resources can come from past periods, could be forecasted by various analysis or calculation methods. Resources and working time can be estimated and planned from standards of consumed materials and standards of consumed work performance.

### **7<sup>th</sup> step – how to control?**

- It must be assessed how often and by what method will be activities monitored and controlled. In this phase it is also necessary to specify communication channels (meetings, e-mail) for effective information gathering, transfer and evaluation.

### **8<sup>th</sup> step – what will happen if...?**

- Planning process should take into account also possible alternatives of consequences arised by accepted decisions. Therefore it is necessary to analyse external and internal environment in order to prevent negative impacts. This final step can be considered as a feedback within the planning process.

## **Production planning and managerial tools**

It should be recognized that in any individual company, the functions and responsibilities of Production Planning may be divided between various departments or individuals and will not necessarily be organized into a Production Planning division. Centralization of the planning function into a Production Planning division improves and facilitates a co-ordinated and properly executed planning.

The functional duties of Production Planning will generally include:

1. Sales forecasting or active participation in sales forecasting
2. The determination of production requirements (specification and quantification of raw materials, other inputs, machinery in order to effectively utilize capacities in a company and to meet sales forecast)
3. Inventory management (both input and output stock optimization)
4. Labour requirements (criteria for the choice of most suitable employees and necessary amount of employees)

Every day, managers must make decisions without knowing precisely what will happen in the future. Decision making requires making forecasts about the future, so managers must often rely on their subjective feelings and best forecasts as they plan. The more accurate these feelings, the better prepared managers will be. Experience tends to improve managers' judgments and ability to forecast events. Several quantitative methods are available to help managers forecast events. The best managers combine intuition and quantitative tools.

Basic quantitative tools:

- Break - even analysis
- Time series analysis

- Causal modeling (regression analysis)

Qualitative tools of forecasting help to generate information, ideas and judgements that managers need for planning and decision making. Whereas quantitative techniques are focused on selecting the most desirable from a set of options, qualitative tools focus most heavily on identifying options. The following is a list of some qualitative tools:

- Decision tree
- Decision matrix
- Brainstorming
- Delphi technique
- Nominal group technique

## **Discussion**

In the following Fig. 3 it is presented sequence of planning and decision making process through the application of decision tree within the logistics supply chain. It is an effective, dynamic and visual tool which presents possible solution of particular decision making alternatives. It should be desirable to quantify all given alternatives from the point of view of costs, amount, time and quality.

The following steps should contain such tools as Gantt chart, PERT and histogram. These enable to evaluate production process from the view of time and capacity and to decompose it into operations.

All the above mentioned parameters must be optimized in order to meet customers' demands and company's optimal utilization of all resources.

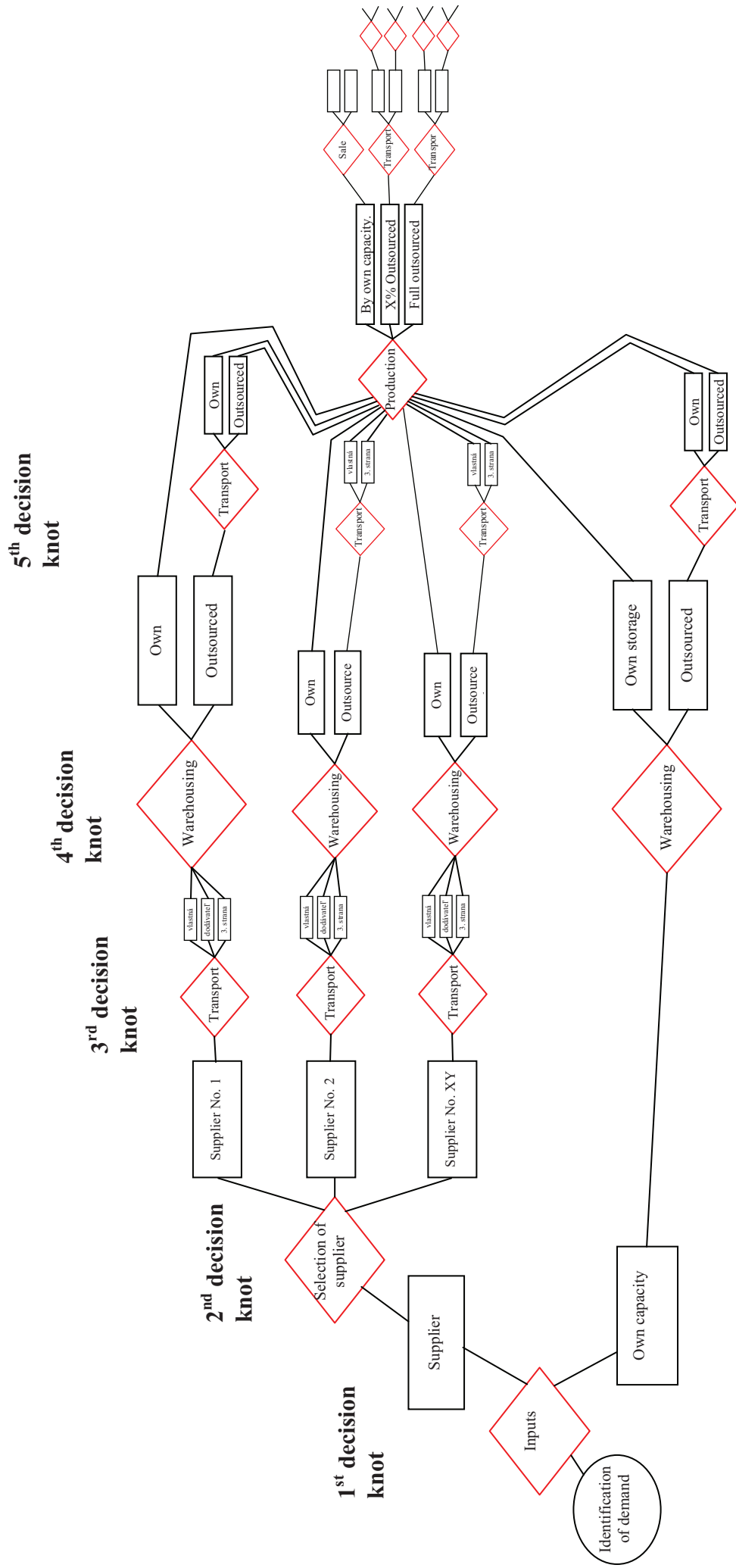


Fig. 3: Possible decision making situations within the material flow

## Conclusions

Production planning has a great impact on the company's flexibility to meet the market demands. And it is not only planning and forecasting of final products but also to deal with production capacities and technology assemblies. All production factors must be spent in the supply chain under optimal costs and time and this is the task of planning. It is dynamic process which must highly take into account economic cycles.

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# CLUSTER AS AN ELEMENT SUPPORTING PASSIVE WOODEN BUILDING DEVELOPMENT

*Renata Stasiak-Betlejewska – Stanisław Borkowski*

## **Abstract:**

Cluster is effective element which can support innovative activity realized on analyzed region. Cluster is also an example of promoting different companies' network acting for sharing knowledge among enterprises acting in the same branch. An article shows cluster's idea concerning wooden and passive building realized in polish conditions.

## **Key words:**

region, cluster, competition, enterprise

## **1 Introduction**

The processes taking place in today's economy, social life and political conditions, cause that regions have increasingly importance in the socio-economic development of countries. The region, usually defined as an area of outstanding national characteristics such as geographical, cultural and physical, and often begins to be treated as economic space, which is distinguished by specific competitive.<sup>1</sup> Thus, the economic region should be treated as a system:<sup>2</sup>

- organized intentionally, that is appointed to carry out specific economic and social objectives and consciously fill functions and tasks resulting from it;
- structured and hierarchical, due to internal control subsystem, which controls the whole system of the region;
- relatively isolated from the environment and open in relation to surrounding social environment, economic the natural environment leading to this exchange of people, goods, funds and information;
- with an asset of exogenous and endogenous factors, necessary to undertake certain activities and usually interconnected by way of feedback;
- is able to self-determination and the selection and modification of goals, and to increase the degree of its efficiency and the degree of organize.

In the region, there are individual elements of the economic system, which should include, among others businesses and households. These entities constitute the real, as distinct from the sphere regulations (state bodies, local authorities, institutions, associations, etc.), which performs regulatory functions.

The region development is affected by a number of determinants, which should be considered in the spatial dimension, socio-cultural, environmental, technical, economic and planning.

Theories of regional development, an attempt to clarify the processes of economic area development, indicate often a variety of different increase mechanisms. There is no universal theory of spatial development. However, contemporary regional development factors can be identified, which include:

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<sup>1</sup> KOPALIŃSKI, W.: Słownik wyrazów obcych i zwrotów obcojęzycznych: Wiedza Powszechna, 1968, p. 214.

<sup>2</sup> KOSIEDOWSKI, W.: Zarządzanie rozwojem regionalnym i lokalnym. Problemy teorii i praktyki.: TNOiK, Toruń 2001, p. 34.

- geographical position and value and state of the natural environment,
- labor resources and the flexibility of the human factor,
- infrastructure, particularly transport infrastructure and telecommunications level,
- social infrastructure shaping the social infrastructure,
- existing economic potential, including the cost of obtaining local production factors (such as land price, labor costs),
- infrastructure business environment and financial structure,
- the local market and foreign markets,
- the level of science and technology,
- modern technologies and innovations,
- the legal system governing relations between the state and the economy,
- international relations and bilateral cooperation.

It is worth to note, that there is growing importance of entrepreneurship and innovation in the development of competitiveness and development of regions. Modern technology and innovative capacity are also considered as the primary factors determining the competitiveness and economic development of regions. The functioning of innovative companies that transfer technology from science and employ highly qualified specialists, is called ‘driving force’ of the region development.

Formation of mentioned factors by means of an effective policy, which leads to increased innovation of the region, depends on the business climate which prevails in the region.

## **2 Theory of cluster**

The key to success is the level of countries competitiveness and their companies, because it becomes an axiom of the modern regional areas development throughout the world. It is the more important that the clusters are considered as a separate economic system, which affects the dynamics of growth of both entities - actors, cluster initiatives, as well as regional, national and global economy. It is the prospect of success built on a high-quality competition brings together universities, entrepreneurs and local and mobilizing for action towards the clusters formation. Clusters are factor influencing on obtaining high rates of economic development.

The cluster should be understood as the spatial concentration of enterprises, institutions and organizations, an extensive network of interlocking relationships of formal and informal nature based on a common trajectory development (e.g. technology, common target markets, etc.) simultaneously competing and cooperating in certain aspects of the action.<sup>3</sup> The cluster in the literature is sometimes also referred to as clusters, industrial beam and local production systems.

According to the UNIDO, regional clusters and territorial concentration of companies producing and selling similar or complementary products, and thus forced to overcome similar problems and challenges. As a result, it can cause the formation of specialized suppliers machinery and raw materials and cause the development of specialist competencies and skills, as well as faster development of specialized and personalized services.<sup>4</sup>

Definition of cluster was put in Polish regulation of Ministry of Economy dated on 11 of December 2006, which stated that a cluster means spatial and sector concentration of

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<sup>3</sup> PORTER M.E.: Porter o konkurencji. Polskie Wydawnictwo ekonomiczne, Warszawa, 2001, p. 15.

<sup>4</sup> UNIDO: SME Cluster and Network Development in Developing Countries: The experience of UNIDO, Private Sector Development Branch, Working Paper no 2, 1999.

organizations dedicated to economic development or innovation, and organization of at least 10 companies carrying out business activity in one or several neighboring provinces, competing and cooperating in the same or related industries and an extensive network of relationships associated with formal and informal nature, where at least half of the entities within the cluster are entrepreneurs.<sup>5</sup>

In the literature, there is a number of clusters classification. Due to the organizational structure, there are groups similar to the Italian districts (with the dominance of small and medium enterprises), in a type of a hub-and-spoke (based on the cooperation of large local corporations affiliated with the SME's group) and satellite clusters (based on the SME sector, which is dependent on external companies). In accordance to Organization for Economic Co-operation and Development (OECD) following types of clusters can be identified:<sup>6</sup>

1. Clusters based on the knowledge (specific to the companies belonging to sectors with high R&D intensity and the intensity of patenting). Usually they arise around a strong public sector research institutions.
2. Clusters based on economies of scale (typical for companies having own research on a very small scale, focusing on production systems on a large scale. It is characteristic for food processing and other materials processing mass).
3. Clusters depend on the supplier (companies importing technology, mainly in the form of capital goods and intermediates, their innovative activity depends on a large extent on their ability to interact with suppliers and after-sales services. Found in agriculture, forestry and traditional processing industry).
4. Clusters of specialized suppliers (based on firms with high R&D intensity, with emphasis on product innovation and relationship with the user. Typical of the companies producing complex production systems, such as equipment and computer software).
5. Intensive clusters in information (specific to companies managing complex information processing systems to provide services and goods to meet customer needs. Typical for financial services, wholesale trade, publishers, travel companies, etc.).

The creation of a cluster is usually due to a grassroots initiative of the companies that are beginning to recognize the benefits of cooperation, such as: higher efficiency, the flow of knowledge or access to suppliers. Creating of cluster linking is often a priority direction in a number of development strategies, and therefore public authorities sometimes try to animate a top-down cluster compounds by promoting the idea of clustering, support for projects to educate and strengthen the relationship between SMEs and research and development.

Clusters role in supporting regional development and raising innovation is indisputable.

The general aim of policy based on clusters should be constant increasing local, regional and national economy competitiveness level. Policy based on clusters should lead to enterprises innovativeness increase. Consequently, the clusters are the basis of next European Commission initiative, namely the development of 'regions of knowledge and innovation "(Regions of Knowledge), which is a continuation of the regional innovation strategies building process. The idea of regional knowledge and innovation is based on the concept of "learning regions". It assumes that the factors of enterprises competitiveness, that allow them to operate in global markets (innovation, flexibility, network strategies, entrepreneurship), formed in conditions of local development.

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<sup>5</sup> KOWALAK, B.: Znaczenie klastrów dla rozwoju gospodarki, Ministerstwo Gospodarki, Departament Instrumentów Wsparcia, Warszawa 2007, p. 34

<sup>6</sup> WOJNICKA E., KLIMCZAK P., WOJNICKA M., DĄBKOWSKI J.: Perspektywy rozwoju małych i średnich przedsiębiorstw wysokich technologii w Polsce do 2020 roku, PARP, Warszawa, 2006, p. 75

However, entrepreneurs can benefit from creative resources in the region and have provided an effective and fast access to knowledge and innovation, essential is functioning of the research cluster. The research cluster is understood as a cluster of cooperating research entities, companies, regional authorities and centers of supporting entrepreneurship and innovation, working to a particular sector of science, technology and economy. Arguments that support promoting the research clusters development are as follows:

- a) innovation economy depends not only on the results achieved by companies and research institutions, but above all on how to interact with each other and the public authorities;
- b) innovation is the result of frequent interaction between people, enterprises and organizations, which resulted in creating a new knowledge and know-how;
- c) proximity of actors promotes the creation, absorption and use of knowledge and the formation of regional innovation systems.

### **3 Clusters in Poland**

In 2007-2013, Poland can spend over 100 million to support initiatives aimed at creating local production systems, called clusters. Clusters can be supported under the EU Operational Program 'Innovative Economy'. The funding can be applied by a joint venture group businesses, generating projects:

- advice and training,
- investment in creating the organizational structure and management,
- operational for the preparation of joint development plans,
- infrastructure,
- investment necessary for the operation and development,
- investment for marketing activities and build cooperative relations.

This budget and the wide range of opportunities that can be taken by institutions managing clusters, will result in a very large increase in the number of cluster initiatives and its dynamic development. Perspective of EU funds that are available to participants in the framework of the cluster and cluster managers, the above described activities may be useful in economic conditions adaptation in Poland. Comparing abilities of Polish enterprises with other European enterprises shows lower level of knowledge and competitive skills. These capabilities could be enhanced by co-operation which let for achieving results that are impossible for single players (especially SMEs). Several studies indicate that the propensity for cooperation between Polish companies between themselves and with the science sector and the business environment is poor.

Development of cooperative relations between enterprises and scientific institutions have been initiated in 2004. Supporting and developing cooperative relations in Poland was emphasized in the strategic document - "Strategy for Increasing the Innovativeness of the Economy for 2007-2013".

In mentioned document part called 'Infrastructure for innovation' it was emphasized, that efforts should focus on the following areas:

- increasing the awareness of entrepreneurs regarding the benefits of cooperation with the units organizations and other businesses,
- to establish effective public-private partnership,
- ensuring conditions for networking,
- support the development of clusters
- support development of technology platforms in high tech sectors,

- support for joint activities by entrepreneurs and the science sector, aimed at implementing innovative projects.

Survey concerning the cluster initiatives in Poland shows, that they are usually assumed by associations (41%). Another units which manage with cluster initiatives are: universities (23.5%), science and technology parks (17.6%), commercial companies (11.8%) and transformations agencies, development agencies (5%). This is because of the fact that the EU funds can be used by non-profit organizations, which constitutes majority of institutions appears in the result of realization of a project co-financed by the European Union. Other kinds of institutions which initiative clusters are connected with universities, foundations, innovation centre, local municipality units and centre of European information.

The most important reason of creating clusters is linked with co-financing by the European Union projects and constant building initiatives in the form of enterprises and research centre cooperation.

Cluster initiative may also be based on success factors, such as:

- the presence of the existing networks, partnerships and linkages,
  - a strong innovation base with supporting R & D, where it is appropriate,
  - the existence of a strong base of skills
- and the factors supporting the success of the cluster:
- appropriate technical infrastructure,
  - the presence of large companies,
  - a strong corporate culture,
  - an access to finance.

### **3.1 Clusters funding**

The study shows that the initiatives in Poland, formed either by the government (including the European projects) or joint initiatives of government and industry. Four of the analyzed initiatives were created thanks to the initiative came directly from the budget of companies. Both initiating and funding clusters in Poland are linked mainly with companies that create cluster initiative (79.3%). The most often pointed finance sources come from European structure funds e.g. ZPORR, INTERREG, EQUAL Initiative and research-scientific grants. The largest funding for appointment of cluster initiatives in period 2000-2006, managing authorities may have received from the Integrated Regional Operational Program. There are new funds based on the structural funds programs not only support the development of clusters, but also cooperative relations (for period 2007 – 2013).

The research results also concern actions for which the initiative received European grants. The most often granted actions were: investment and cluster development, training of personnel, development of services for company and construction of infrastructure (Fig. 1).



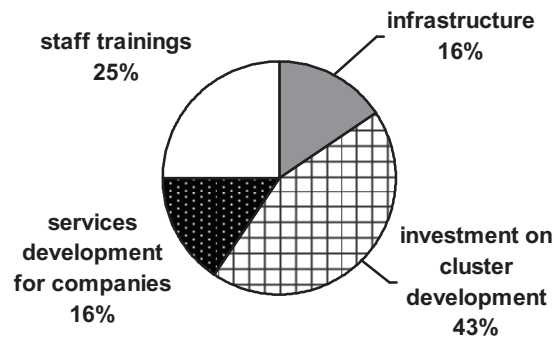


Fig. 1. Initiatives of clusters which were financed by European Funds.

Source: *www.stat.gov.pl* (Polish Central Statistical Office).

Investments on the clusters development (43%) are mainly associated with expanding activity areas, particularly in R&D area, where demand for the development of laboratory services increases (16% of expenses). This involves the need to ensure adequate research infrastructure in the newly established laboratories (16% of expenses).

#### 4. Region attractiveness building by clustering – chosen cluster cases

The most popular cluster in the world is located in Silicon Valley in California in USA. Silicon Valley it being marked by technological bond very much with high mobility of the staff (average working time of workers in the company it two, three years, what happens by that they are coming back to the same enterprise again). Next example of cluster, Telecom City, situated in the southern region of Sweden, Blekinge (the biggest Karlskrona city) is the leading telecommunications cluster in the international scale concentrating the most important world companies of the ICT sector.

In Poland there are also clusters about the different size and being at the different stage of the development. Polish enterprises, which are an example of activeness in clustering in that article, represents group of European enterprises which generate the majority of profits and work places in gross national income. The SME's sector in Poland represents 99.9% of all enterprises acting in Western Pomerania. In the group 29 478 of all enterprises [Polish Central Statistical Office, 2011], only 174 companies are large, employing over 250 employees.

In the sector of micro, small and medium enterprises micro enterprises dominate. The importance of SMEs in the regional labour market is high - they employ more than 60% employees in enterprises. At the same time, there is a high labor productivity in small enterprises. The share of SMEs in investment spending is also low, although investment activity per one worker was one of the highest in Poland in 2011. It should be stressed, that SME sector in the chosen region of Poland (Western Pomerania) takes the first position in terms of entrepreneurship rate, i.e. the participation of micro, small and medium businesses per 1,000 inhabitants. One of the most important sectors of the region includes wood and furniture industry, where highly-developed forest region exists.

Western Pomerania has a low percentage of innovative companies in the SME sector in Poland, which makes the province is classified as a group of four of the weakest regions. For companies operating in the region the most significant barrier to development and innovation activity is a difficult access to finance. In addition, companies cannot cope with the acquisition of EU aid, a major problem is the high cost of innovation. They also complain about the lack of qualified or too theoretical knowledge. Lack of qualified staff is certainly the result of



emigration of young educated people to Western European countries, mainly Ireland and the UK. The problem is poor communication between economic actors, the lack of mutual trust, weak interest in innovation support services on the one hand and improper alignment of the offer to the other. It was also diagnosed, that there is poor cooperation between science and practice, and thus a weak transfer of new technologies and know-how to the economy.

As previously it was mentioned, the region is characterized by a dense forestation, which favors the development of furniture industry. Relatively low production costs, high level products and the growing domestic and foreign demand make production growth of the sector is high and constantly growing surplus of exports over imports. It is the main reason for development of wood and furniture cluster since 2007. A strategy for the furniture industry in analyzed region has been prepared under the project "Stimulating innovation in the economy by supporting the cluster development - pilot activities" carried out in Action 2.6 ZPORR co-financed by European Social Fund. In accordance to that strategy:

- potential participants of the cluster are not integrated, and thus are ready to formalize the collaboration;
- cooperation (if any exists) takes place informally and occurs mainly in the line of enterprise-enterprise;
- potential participants of the cluster cannot see in their cluster group animator, nor do they see out the possibility of a new partner integrating its collaboration.

There were several reasons which constitute basis of the cluster appointment such as: low innovativeness, problems with suppliers and clients, low level of marketing management, staff problems, problems with financial position, lack of administrative units support and appropriate law regulations. Therefore, the proposed furniture cluster development strategy is mainly aimed at overcoming these barriers, which it will be possible by strengthening the cooperative relations between the actors in the industry. Strategic goals covers areas, that were identified as problematic for the industry with furniture and include:

- increasing the availability of raw materials and collaboration with suppliers,
- development of the necessary human resources for the furniture industry,
- new markets development by streamlining operations promotion and distribution, optimizing the performance of companies in the context of financial management,
- improvement of relations with the environment and the active development of administrative legal environment,
- development of own design.

Institution, which has assumed the duties of the maker of cooperative relations in wood and furniture industry is the Szczecin University of Technology. Its efforts, supported the activities carried out within RSI (Regional Innovativeness Strategy) project may contribute to the further strengthening of cooperation between enterprises, and in turn move from pre-industrial wood and furniture cluster to the cluster seed.

The furniture industry is considered from the early 90s as one of the most important driving forces of the Polish economy and exports. The share of the furniture industry in 2011, the GDP is 3.2%, more than two times higher than in other European Union countries. The furniture industry for many years has a very high dynamics of production, much higher than the average in the industry.

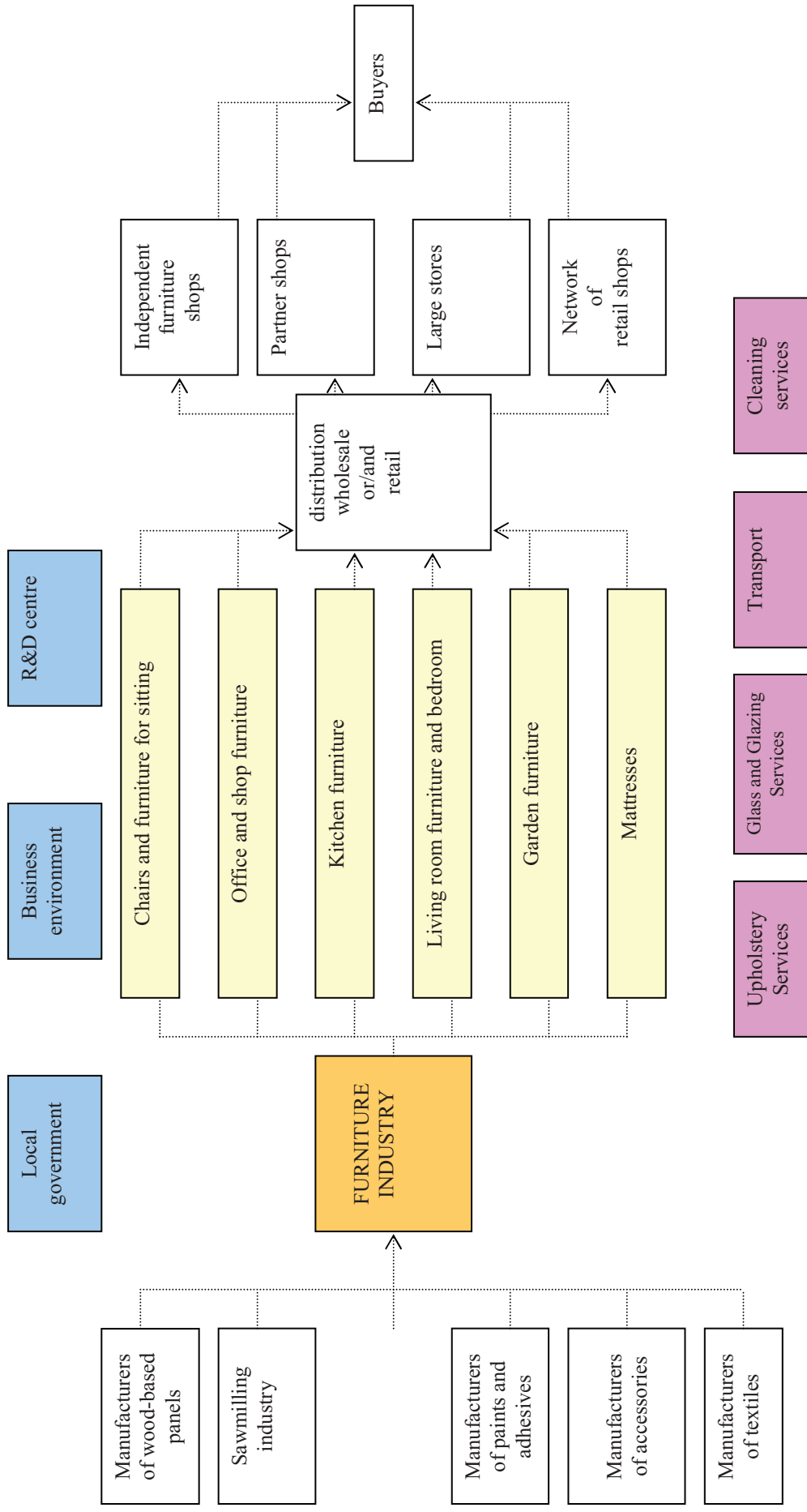
Warmia and Mazury region, considered as the most attractive places in Poland in terms of companies location connected with the furniture industry, promotes the development of this industry due to the large resource base, a strong tradition, the presence of large companies from

the wood and furniture, and proximity to regions with a relatively large raw materials. The sector of small and medium enterprises of furniture industry in the analyzed province is underdeveloped and highly fragmented. In the region, there are several large companies that dominate because of the employment structure and they are the engine of smaller businesses growth. A characteristic feature of the furniture industry in the Warmia and Mazury region is a high level of employment (much larger than the foreign "regions of the furniture") and low efficiency. Furniture industry companies with the result of 3 567 million PLN (9% share) taking third place in terms of total net sales in the region.

Among the factors determining the competitiveness of companies, innovations play particularly importance. The value of expenditures on innovation activities in general in the Warmia and Mazury region is one of the lowest in the country. In the region there is no fixed process of technology transfer. Low level of expenditure is due to the fact that the economy of Warmia and Mazury is dominated by low technology industries. It is worth to note, however, that the innovation activity of enterprises located in the Warmia and Mazury is one of the highest in the country (share of companies with innovation activities is higher than the national average). Companies producing furniture were spent on innovation in 2000-2011 averaged just over 16% of total expenditure, taking fourth place in the province.

Despite this, the furniture industry enterprises of Warmia and Mazury region awareness of the innovation importance in the modern economy is negligible. In furniture companies of the region, a source of innovation in the embryonic stage include internal R&D departments. There is little discernible cooperation with various R&D institutions, but the importance of this cooperation is rated low. Similarly, the relatively low level of assessment is noted in the case of cooperation with units of local government and consulting firms. Low spending on R&D result from such lack of strong research and development center in the region. In terms of innovative activity, the furniture industry companies appreciate the cooperation with customers and subcontractors.

Fig. 2. Scheme of the furniture cluster in the Warmia and Mazury region.



Vision of the Warmia and Mazury furniture cluster states, that furniture products from Warmia and Mazury region are associated with high quality and recognizable brand. The quality increase and original design will be an effective tool for promoting both the region and business cluster. Furniture cluster will focus on the different actors of the production profile, whose business revolves around the production of a wide assortment of furniture, accessories, furniture and other items necessary to ensure their proper functioning, safety and aesthetic, modern look. The cluster initiative will bring together entrepreneurs who do business in an ethical manner, respecting the standards and laws: customers, employees, local communities and the environment, which will help to create a compact of the local community.

Areas of activity analyzed cluster development strategy are following:

1. Creating a common brand companies forming cluster initiative, which aims to sales increase of individual firms, and to develop regulations for granting rights to the brand.
2. Activities supporting certification of furniture confirming the high quality of products manufactured within the cluster.
3. Marketing and promotional efforts to increase awareness of the furniture companies in the region in the country and in foreign markets.
4. Integration of the furniture industry for project aims to develop innovative new products and manufacturing process improvement.
5. Activities focused on adequate training of employees in relation to the needs of the furniture industry (professional development programs along with extensive practice) to improve the image and attractiveness of the profession.
6. Creating and development of own design.
7. Lobbying local government and national level, within which the industry will promote a solution favorable to its development.

Other examples of furniture and wood clusters in Poland are located in provinces such as Wielkopolska and Łódzki. Association of Elbląg Furniture Cluster was registered in 2007 and it is an initiative of the local municipal council, which includes Elbląg and its surroundings. That cluster cooperate with Institute of the wood technology in Poznan in the aim to support knowledge level increase and competitiveness of furniture companies in the region. Cooperation result is opening Centre of Wood Technology in the frame of Elbląg Technological Park in 2011. That centre deals with technology transfer, laboratory research made for companies and promoting knowledge on wood technology solutions. The object of project realized by cluster is related to European funds spent by enterprises on: modern production lines purchase, cooperation relations development, new technology solutions development.

## **5. Conclusion**

The most important profit resulting from clustering is connected with an access to newest technological solutions worked out owing collaboration of universities and companies through knowledge and technology transfer. It is goal achieved by cluster partners in long perspective and joint R&D project as well. The other profits coming from joint marketing and branding and acting in a group. Clustering is an idea which not only collect organizations interested in realization of the same goals but is based on knowledge transfer what create new possibilities for partners of that kind of network.

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# EFFECTS OF PASSIVE HOUSE PROMOTING IN EUROPE

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## **Abstract:**

Passive wooden houses became more popular in Europe in last two decades in the effect of European Sustainable policy. An article presents idea of passive house building and its promotional activities. Research including in that article shows chosen ways of that industry' promotion and its recognition.

## **Key words:**

sustainability, passive house, European policy, promotion

## **1 Sustainable development and passive wooden building**

International calls emphasizing the importance of capacity building for sustainable development have been numerous and a great deal of attention has been drawn to the specific capacity building needs in developing countries and countries with economies in transition.<sup>1</sup> Capacity building has been embedded in the objectives and programs of work of many international organizations and they offer a wide range of capacity building activities.<sup>2</sup>

The definition of capacity building as a means to promoting sustainable development is broad and can encompass a multitude of activities. In its publication "Capacity Building for Sustainable Development"<sup>3</sup> UNEP described capacity building as building abilities, relationships and values that will enable organizations, groups and individuals to improve their performance and achieve their development objectives. Capacity building was also described as initiating and sustaining a process of individual and organizational change that can equally refer to change within a state, civil society or the private sector, as well as a change in processes that enhance cooperation between different groups of society. This definition puts emphasis on three aspects: (a) capacity building as the catalyst and constant fuel for a process of change, (b) the importance of building institutional capacity, and the (c) involvement of a wide range of different groups in society.<sup>4</sup>

The definition of sustainable development - development that allows for the fulfillment of present needs without compromising the capacity to meet the needs of future generations - refers to many areas of human activity, including the construction industry.

Sustainable building means not only building new houses, offices and factories in accordance to sustainable idea. It is also using of sustainable materials, safe building practices and new technologies taken into account, such as risk assessment of engineering and damage

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<sup>1</sup> relating to the work of UNEP-ETB, please see: Agenda 21 (Paragraph 8.12); Rio+5 Resolution (Decision 8/6, paragraph 29); World Summit on Sustainable Development Plan of Implementation, (Paragraph 91d and Paragraph 137); WTO Ministerial Declaration from Doha (Paragraph 33); UNEP Governing Council (GC) 21/14.

<sup>2</sup> Examples include: the Capacity Development Program of the United Nations University, the UNEP- NCTAD Capacity Building Task Force for Trade, Environment and Development, the Bali Strategic Plan for Capacity Building and Technology Support of UNEP, the Capacity 2015 initiative of UNDP, etc.

<sup>3</sup> Capacity Building for Sustainable Development: An Overview of UNEP Environmental Capacity Development Activities, UNEP 2002, p. 11.

<sup>4</sup> *Ways to Increase the Effectiveness of Capacity Building for Sustainable Development*. United Nations Environment Program. Concurrent Session 18.1 The Marrakech Action Plan and Follow-up. 2006 IAIA Annual Conference. Stavanger. Norway.



caused by climate change and air pollution. This goal is included in realization of project such as SHE project which is a series of projects to check the feasibility of sustainable housing - 714 cost-effective, energy-efficient and innovatively designed homes in eight cities - for all social groups. After completion of the project in 2008, the planning and development of best practices has become available for developers, citizens and policy makers.

Due to the growing awareness of the problem of excessive energy consumption including greenhouse gases into the atmosphere was a wide range of EU documents related to the energy (and therefore ecological) aspects of sustainable development in construction. In the frame of the climate change, it is necessary therefore to amend the design, construction, operation and demolition of buildings. This applies in particular to: reduce the demand for heat, cooling and electricity, the use of non-conventional and renewable energy sources, increase the efficiency of equipment and systems used for heating, ventilation and air conditioning of buildings, changes to user behavior, changes in the approach to system design or optimizing the architecture of the buildings. The most important EU regulations are connected with energy characteristics of house what includes energy efficiency and kind of used materials.

Passive buildings are connected with the sustainable energy idea, which constitutes strategy for the European concept of supporting energy efficiency.

The passivhaus standard is a specific construction standard for buildings with good comfort conditions projected with regard to climate conditions, without traditional space heating systems and without active cooling. Typically it includes optimized insulation levels with minimal thermal bridges, very low air-leakage through the building, utilization of passive solar and internal gains and good indoor air quality maintained by a mechanical ventilation system with highly efficient heat recovery. Renewable energy sources are used as much as possible to meet the resulting energy demand (PEP, 2006), including that required for the provision of domestic hot water (DHW).<sup>5</sup>

Irish definition stated that, a passive house is an energy-efficient building with year-round comfort and good indoor environmental conditions without the use of active space heating or cooling systems.<sup>6</sup>

In Canadian definition, the passive house approach to construction is an ambitious response to global climate change and energy security issues. Despite increasing media attention the majority of Canadians are likely unaware of the potential scale and severity of climate change, nor the social implications of energy resource depletion.<sup>7</sup>

Passive house standard became a quality standard, but it doesn't focused to any particular construction methods. Architects can design passive houses according to their and clients preferences whether it could be a solid or wood construction. Realization of the sustainable development is connected with applying renewable natural resources. There are several reasons why sustainable and passive buildings use wood in the constructions:

- Timber is a natural product and a multi-layered material. Its two most important components are cellulose and lignin. Cellulose gives timber its high tensile strength, while lignin binds the cellulose fibres.
- Timber is lasting. Different types of timber have different resistances to wood-destroying organisms. Within a lumber cross-section there are also differences in natural durability.

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<sup>6</sup> *Retrofitted Passive Homes. Guidelines for upgrading existing dwellings in Ireland to the passivhouse standard*. Sustainable Energy Ireland. 2009.

<sup>7</sup> Canadian Passive House Institute

- The versatility of timber. Different types of timber offer various fields of application, both technically and visually. Because of its high strength-to-weight ratio, its versatility and its easy ability to be combined with other materials, timber is a universal building material, which can meet the needs of various design wishes.
- Prefabrication regardless of weather conditions.
- Particularly short construction period. The high level of pre-fabrication of buildings, due to the technology used and team's excellent know-how, significantly reduces the construction period.
- Gain in net-useful area. In comparison with a stone house and given the same thermal insulation, the 'slim' construction of a timber house results in a considerable gain in useful interior area. For example, given the same floor space, a timber house has around 10% more useable area, and, in an average single-family house, this equates to an additional room.
- The pleasant indoor climate owing to the small difference in temperature between wall surfaces and indoor air prevents inconvenient, disruptive draughts.
- The ecology. Growing wood absorbs the greenhouse gas CO<sub>2</sub> from the air and permanently stores it (therefore preventing it from being emitted into the atmosphere). Timber components can be processed after their serviceable life without any problems, thereby effectively protecting the environment. The processing of timber needs only a little energy in comparison with other building materials.

## 2 Sustainable building in European Union actions

International activity on passive idea was moved to European background in the form of several EU documents, regulations and projects proposals. Every activity idea results from general policy of European Union which covers going toward energy efficiency. Some of essential European sustainable policy actions were presented below.

EU Sustainable Energy Week (EUSEW) is a core activity of the Sustainable Energy Europe Campaign. Every year hundreds of organizations and individuals participate in the EUSEW by hosting Energy Day events and activities that promote energy efficiency and renewable energy sources. An Energy Day is defined as a not-for-profit event, activity, project, exhibition or display that promotes energy efficiency or renewable energy.

The combined results of EUSEW efforts are helping Europe countries reach its energy goals in different way. There are some reasons to be get involved in EUSEW:<sup>8</sup>

- be part of European movement towards a change in the energy landscape,
- get communication support from the EUSEW Secretariat (event organization, media relations, social media) and improve your chance of impact
- showcase initiatives throughout social media channels,
- benefit from the EUSEW online web platform, and get in the official program,
- benefit from a European media focus on sustainable energy and achieve media coverage for your organization,
- Energy Days can be any event to promote energy efficiency or renewable energy.

Example of the most effective action in the frame of sustainable passive houses idea promotion concerns realization of European projects. One of the first projects was *CEPHEUS* project number BU/0127/97. Its content concerns construction of ca. 250 housing units to Passive House standards in five European countries, with in-process scientific back-up and

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<sup>8</sup> Sustainable Energy Europe Campaign

with evaluation of building operation through systematic measurement programs. It has set itself the following goals:<sup>9</sup>

- to demonstrate technical feasibility at low extra cost for an array of different buildings and designs implemented by architects and developers in a variety of European countries;
- to study investor-purchaser acceptance and user behaviour under real-world conditions for a representative range of buildings;
- to test the implementability of the Passive House quality standard throughout Europe with regard to cost-efficient planning and construction;
- to provide opportunities for both the lay and the expert public to experience the Passive House standard hands-on at several sites in Europe;
- to give development impulses for the design of energy- and cost-efficient buildings and for the further development and accelerated market introduction of individual, innovative technologies compliant with Passive House standards.

The next example of good practice in the range of passive houses promotion is included in project called REBECCE *Renewable energy and Building Exhibitions in Cities of the Enlarged Europe*, which provides about five cases of "good practice" that can be used in the future as examples to raise the confidence of potential decision-makers, experts, promoters, investors and end users. Additionally, three other cities - Sofia (BG), Riga (LV), Vilnius (LT) - take part as the observers in the project and will be enabled to implement similar RES H/C projects in their regions. This project was based on the know-how transfer from previous similar exhibitions and training campaigns of European Solar Building Exhibitions (2002-2005). It also promotes the information on the markets for low-energy housing and RES H/C applications in Europe and facilitate development of new businesses in the participating countries. The emphasis of a market orientation approach in the overall concepts of the exhibition should considerably improve the likelihood of sales of the passive-solar houses. REBECCE implements RE technologies and system solutions regarding their compatibility with national and international standards. This project is aimed to promote renewable energy heating/cooling applications and energy efficiency solutions for buildings.

The other example of promoting action in the area of European program on sustainable passive building is *European portal for energy efficiency in buildings*, which is a platform where policy makers, building professionals and building occupants can get together. This platform encourages to share practisers valuable knowledge on how to reduce energy consumption in buildings and let all practisers and researchers work together towards cleaner and more energy intelligent buildings for the future.

The passive house concept has become a European wide accepted solution to reach a significant energy demand reduction in the built environment. The European Commission has published the ambition to construct newly built houses in 2015 accordingly to the passive house standard. In most project participating countries this ambition is shared. With the support of the Intelligent Energy Europe program this project "Promotion of European Passive Houses" (PEP-project) contributed to achieve this ambition to clear the first market barriers internationally to reach the status 'Business As Usual' for passive houses in 2015. The PEP project is aimed at the development of easy accessible web based documentation for stakeholders in the building process to solve national market introduction barriers regarding the passive house concept (Fig. 1).

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<sup>9</sup> CEPHEUS project number BU/0127/97

The project is also aimed at the distribution of this information via international and national workshops, seminars and conferences. It can be concluded that the PEP-project has been successful.



Fig. 1. European Embedding of Passive Houses (2008).

Source: <http://erg.ucd.ie/pep/>

All participating countries made significant progress in the societal embedding process of passive houses and in most countries the passive house concept is on the brink of breaking through nationally. Further, PEP-project contributed successfully in the internationalization of the Internal Passive House Conference and fixed the definition of a passive house for three geographical European regions. Finally, the PEP website with its wealth of information was a powerful tool for promotion of passive houses in Europe.<sup>10</sup>

The other of project of sustainable houses promoting is *Sustainable Housing in Europe (SHE)* funded by the European Commission under the 5<sup>th</sup> Framework Programme on “Energy, Environment and Sustainable Development”. The most important project aims are: to assess and demonstrate the real feasibility of sustainable housing using pilot projects, to develop best practice solutions to set up quality assessment and guidelines based on the direct experience acquired, to evaluate the degree of satisfaction of sustainable houses by future tenants.

Instead of European policy of sustainable passive building promotion, every country in Europe has own strategy of sustainability promoting. For example, Ireland established national energy agency under Sustainable Energy Act 2002. Its mission is to promote and assist the development of sustainable energy. This encompasses environmentally and economically sustainable production, supply and use of energy, in support of Government policy, across all sectors of the economy including public bodies, the business sector, local communities and individual consumers.

### 3 Organizational forms of passive wooden houses promoting

International activity on passive idea was moved to European background in the form of institutions and associations which were appointed for fulfilling aims resulting from European policy of energy saving.

<sup>10</sup> *Promotion of European Passive Houses (PEP-project)*



*The International Passive House Association (iPHA)* is a global network of Passive House stakeholders including architects, planners, scientists, suppliers, manufacturers, contractors and property developers. It works to promote the Passive House Standard and foster a greater public understanding of its significance. Encouraging the exchange of Passive House knowledge, iPHA communicates with the media, the general public and the entire range of construction professionals. Goals and activities of mentioned association are following:<sup>11</sup>

1. Connecting the Passive House sector. iPHA serves as a communication platform for its members, where the listing of members and their activities in the member database plays an important role in connecting the community of experts on passive (wooden) houses.
2. Forging partnerships with Passive House organisations worldwide. iPHA officially affiliates with independent Passive House Associations internationally that have agreed to uphold high standards in their work and have integrated their membership with that of iPHA's.
3. Sharing expertise on the Passive House Standard. iPHA disseminates Passive House knowledge by connecting the local to the global and fostering information flow in both directions to the benefit of all involved. Regular emails and publications detail the latest developments on the Passive House market. iPHA members communicate directly with one another on the iPHA Forum and Passipedia.
4. Building awareness of the Passive House concept. The International Passive House Association (iPHA) promotes the Passive House Standard, as developed by the Passive House Institute, in the public arena. Complete, up to date information can be found on this website, which also presents iPHA members and affiliates.
5. Showcasing completed projects and resident experiences. iPHA encourages the documentation of completed Passive House buildings as well as the experiences of residents and users – essential for communication on the advantages of Passive House to the wider public. All iPHA members can present their completed Passive House projects in an online database carried out in partnership with Passivhaus Dienstleistung GmbH. Additionally, iPHA offers its members support in showing their Passive House Projects in the context of the annual International Passive House Days.

*The Passive House Institute (PHI)* is an independent research institute lead by Dr Wolfgang Feist with a continuously growing interdisciplinary team of employees. PHI has played an especially crucial role in the development of the Passive House concept. The first pilot project (Kranichstein Passive House, Darmstadt, Germany, 1990) was Europe's first inhabited multi-family house to achieve a documented heating energy consumption of below 12 kWh/(m<sup>2</sup>a), a consumption level confirmed through years of detailed monitoring. Since then, the Passive House Institute has assumed a leading position with regard to research on and development of construction concepts, building components, planning tools and quality assurance for especially energy efficient buildings. The website of Institute provides information about international conferences on passive house and is supported by Research Group which gives numerous Passive House building projects through Germany and beyond; the practice oriented proceedings of these sessions are available through the Passive House Institute. Institute improves its platform and supports it with tools for planning and calculation in passive building.

In other countries, such Canada, passive house institutes acts in the same way and are registered as non-profit educational organization. Their goal is to provide citizens with the

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<sup>11</sup> The International Passive House Association (iPHA)

knowledge, tools, networks and confidence to design and construct buildings which meet the world’s highest level of energy efficiency, the international Passive House Standard.

Organizations which provide information for society are situated mostly in capital cities such as *the Scottish Passive House Centre*, which is ideally situated in the heart of Scotland. This centre works closely together with the German Passivhaus Institute and can tap into many years of intensive research, which was carried out in various European countries. The Scottish Passive House Centre has been very influential in the implementation and development of the Passive House standard in the U.K. so far. Centre has been responsible for the certification of the first affordable Passive Housing scheme in Scotland (Tygh-Na-Cladach, Dunoon) and the first certified private Passive House in England (Underhill House Warwickshire) as well as being involved with a number of other projects that are currently under construction or awaiting certification.

Similar way of acting is conducted by *Casa Eco Passiva Sicilia Association* which focus to diffuse concept of Active Houses in Sicily or *the Active House Alliance* is a non-profit association (VZW/ASBL) founded pursuant to the provisions of Title I of the Belgian Act of 27 June 1921 as modified by the Act of 2 May 2002 and which will apply for everything that is not foreseen in these statutes. The Active House Alliance ensure a close cross-sectoral collaboration to enhance visibility and fast track development between the partners in the alliance and create valuable knowledge for relevant partners in society (Fig. 2).

	Objectives	Activities and Deliverables
<b>Knowledge Sharing</b>	Leverage existing knowledge through strong alliance and facilitate cross-sector working groups.	<ul style="list-style-type: none"> <li>• Annual general assembly</li> <li>• Topic based workshops for members</li> <li>• Training and webinars</li> </ul>
<b>Specification and demonstration</b>	Create new knowledge, describe, illustrate and demonstrate the opportunities and attractiveness of Active Houses.	<ul style="list-style-type: none"> <li>• Active House Specifications for residential and non-residential buildings</li> <li>• Simple evaluation scheme of buildings</li> <li>• Demonstration buildings</li> <li>• Catalogue of design patterns and cases</li> <li>• Design and Assessment Tools</li> </ul>
<b>Communication</b>	Influence positively on the full supply chain in the construction sector, politicians and legislators.	<ul style="list-style-type: none"> <li>• Communicate with building users and specifiers</li> <li>• External conferences and symposiums</li> <li>• Training and webinars for specifiers</li> <li>• Influence positively on codes and legislation</li> </ul>

Fig. 2. Goals of the Active House Alliance

Source: <http://www.activehouse.info/about-active-house>.

Special role in the passive wooden houses promoting is played by clusters which develop in accordance of regions needs and its policy. It always corresponds with European regional policy. The example of cluster which promotes collaboration in the sector of passive wooden house is *Furniture and Timber Construction Cluster (MHC)* which is independent network with negotiating, coordinating and accelerating functions as well as starting up and sparking off innovative ideas. Through these activities individuals and cooperative companies



profit as well as the furniture and timber construction branch concentrated in Upper Austria. This cluster organization is related to sectors: furniture/timber construction and woodworking industry. Main activity areas of cluster includes: cooperation (product development, prototyping, technological process improvements, etc.), research and development (resources optimisation, joint purchasing communities, commercialization of products/processes, etc.), trainings, HR upgrading (events, seminars, academic courses), information & communication (staff company visits, newsletter, homepage, CRM database), internationalism (participation in international fairs, support for participation in international research projects), marketing and PR (sectoral related PR, awards, fairs, joint activities/campaign to attract young people for the industry). Achievements of the analyzed cluster were included in the form of projects: “Value added wood” (INTERREG), CEE ClusterNetwork (PRO INNO Europe, 6th Framework Programme), European Cluster Observatory (Europe INNOVA, CIP Programme), European Cluster Excellence Initiative (PRO INNO Europe, CIP Programme, EuropeAid Programme), “Wood Composites” (Cornet). This cluster participated also in platform and network creating such as Holzbaurhitektur (platform of upperaustrian specialists (architects, carpenters and engineers) in the field of timberarchitecture).

#### 4 Enterprise websites as a promotion tool for passive building

Technology platforms, EU projects, associations and clusters are an important joint venture between the European Commission, industry, forestry, research institutions and financial decision-making and certain groups of society, the European Union. Instead of such an initiative as mentioned above, enterprises create also own actions, which are focused on promoting passive house idea in the context profitable business.

Figure 3 presents an example of the one passive building company in Poland, which was assessed on high level taking into consideration all functions needed for clients, who decided to find proper company for passive house investment realization.



Fig. 3. Website of the Polish company from the passive house building industry.

Source: <http://www.termodom.pl/termodompanywny> (10.12.2011)

Presented website of the chosen Polish company (fig. 3) shows that presentation of the offer and building investments during realization are not the only elements included in the website content. This website plays very important role in the passive building promoting. It

is useful for their clients because of many additional elements such as advices in the following fields: financing building institutes, thermal studies idea, useful articles about building of the passive house, energy certificates information or current state of the European law in the frame of passive houses. It includes also the list of advisers who specialize in the range of passive houses. There is also another important category of website functionality – interactive contact with the client, which is supported by e-mails and forum.<sup>12</sup>

Italian example of the passive house building company (fig. 4) is a Progettosofie company from Trento. Innovative element of the website is based on the list of institutions which collaborates with that company towards passive house quality improvement. It is connected with research in the field of supporting low energy level of the passive house.<sup>13</sup>

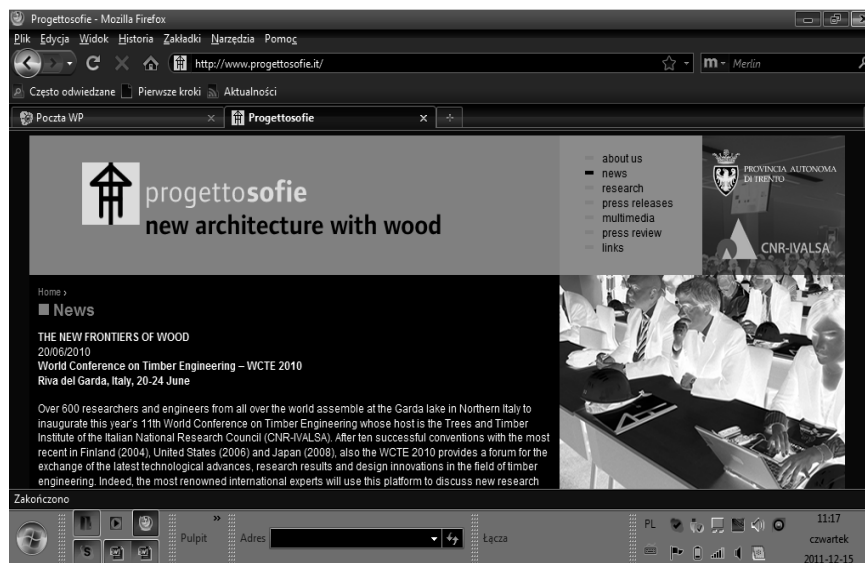


Fig. 4. Website of the Italian company from the passive house building industry.

Source: <http://www.progettosofie.it/> (10.12.2011)

A lot of websites devoted business of the passive houses building companies include information about idea of passive house. It is not only the way of idea promoting but creating awareness among clients who have no enough knowledge about house concept built in the energy saving technology. It is additional value of that kind of website.

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# EVALUATION OF COMPETITIVE FACTORS IN SLOVAK WOOD PROCESSING ENTERPRISES AS THE BASE FOR BUSINESS PERFORMANCE MANAGEMENT

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## **Abstract:**

Business competitiveness and performance were, are and will be in chief tasks of strategic management. The enterprise in market economy is under permanent pressure of competition. It is forced to innovate its internal processes, to respond to new situations and to discover new business activities bringing economic effect. The paper is focused on identification of competitive factors in enterprises determining their success. The attention is paid to evaluation of competitive factors in Slovak wood processing enterprises and to their importance by determination of starting points by performance management.

## **Key words:**

business competitiveness, competitive factor, performance management, woodprocessing enterprise

**JEL Classification:** 19

## **Introduction**

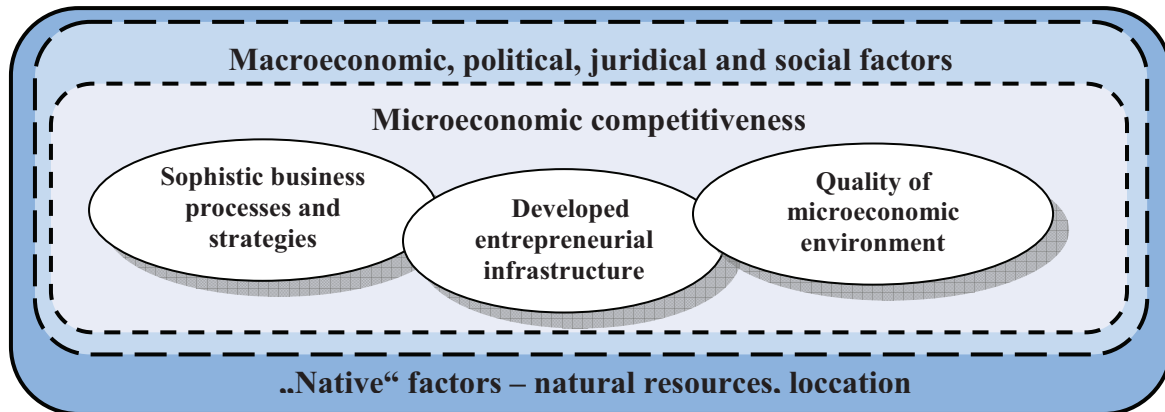
According to material EU competitiveness is defined as an ability of companies, branches, regions and nations to generate high level of incomes and employment. Business competitiveness means ability to keep or to increase market share of a company. Price competitiveness should be differentiated from qualitative one based on position in regard to product assortment. Qualitative competitiveness depends on factors such are utility features of products, quality, reliability, mark, sale techniques or financing conditions. In case of competition of two qualitative comparable products the competitiveness depends on product prices including three groups of factors: costs and productivity, business profit and currency exchange rate. Competitiveness and performance increase is a substance of company success or failure on the market. To be able to stand to hard competition it is necessary for each enterprise to have perfect information about market which an enterprise tries to enter or which has already treated and also information about direct or potential competitors. Enterprises have to build on competitive advantages leading to their growth; they have to enforce programs of productivity growth which make importance of price competition lower in favour of further competitive factors.

### **1. Factors influencing a business competitiveness**

Factors of business competitiveness can be characterized as factors determining a competitive level of enterprise on the market and on their base it is possible to identify competitive advantages and disadvantages.

The most of experts<sup>1</sup> distinguish external and internal factors. Porter (1992) connects particular vertical levels of competitiveness and their factors and he provides a methodical approach enabling to explain and predict competitiveness of enterprise (see picture 1).

Picture 1 Competitiveness factors of enterprises



Source: aligned after Porter, M. E.: *Konkurenční výhoda*. Praha: Viktoria Publishing, 1992, p. 626

After Porter (1992) higher levels create conditions for competitiveness, for fortune creating but they don't produce fortune. Fortune is created on micro level where human, capital and natural resources are transformed into products and services. It depends on ability of enterprises to produce valuable products using effective methods and on quality of business environment. More productive business strategies and processes require more educated and skilled people, better information, more qualitative infrastructure, reliable suppliers, superior research and thereby enable to increase business performance.

According to our opinion competitiveness factors is possible to divide into three groups: external macroeconomic, external microeconomic and internal factors.

## 1.1 External macroeconomic competitive factors

- *Globalization*: in many cases it doesn't work in way of transfer of production into countries with cheap labour and high-qualified work, development and research remain in Europe. In the present period has been rising a global worldwide production structure.
- *Changes have been accelerating*: it relates to product life cycles and prognosis of customer behaviour. New key success factors have been still appearing.
- *Market liberalization and deregulation* creates conditions for new competitors enter into existing markets and elimination of monopoly status.
- *Demographic trend* is determined population maturing with influence on customer behaviour and approach to human resources management. The living has accelerated and it has becoming more consuming.
- *Market digitalization* is connected with using internet and new information and communication Technologies. A positive effect of digitalization is opportunity for improvement of tasks, processes and innovations in enterprises
- *Political, economic and juridical factors* create frame conditions for competitive environment and level of economic competition.
- *National institutional frame*: regional policy, industrial and scientific-research policy, employment policy, taxing system, credit policy, state subsidies and remunerations.

<sup>1</sup> Mezinárodní kol. autorů (2005); Porter, M. E. (1992); Zaušková, A. (2008)

Worldwide economic forum consider a global competitiveness level on the base of 12 factors: public institutions, infrastructure, macroeconomic stability, population health, basic education, higher education and training, effectiveness of product markets, effectiveness of labour market, advance financial market, market volume, advancement of business processes and innovations.

## 1.2 External microeconomic competitive factors

- *Branch and regional factors* form conditions for business competitiveness in affecting area. Among these factors belong:
  - Production resources availability (input raw materials, labour source, energies),
  - Branch technical-technologic and ecologic enterprising prescriptions and standards,
  - Level of technical infrastructure (roads, railways, airports, telecommunications),
  - Level of knowledge infrastructure (education, advisory and research institutions),
  - Level of structure for enterprising support (industrial parks, enterprise incubators, innovation clusters),
  - Financial systems of financial support: grants, European funds, credits supporting enterprising and investments.
- *Factors of market environment* are enterprise's target market factors. Competition position of an enterprise after Porter (1992) is determined by five basic factors: potential and implemented competitors, bargaining power of customers and suppliers and substitutes. On present globalized market can be the market factors characterized as follows:
  - Pressure on product innovation and processes with influence on shortening innovation cycle and fill satisfaction of customer needs.
  - Pressure on costs and prices is evoked by markets opening that make force on outsourcing, to focus on core business and then to costs and prices reduction.
  - Competition benchmarking enables to determine position of enterprise on the market and competitive advantages in comparison with the strongest competitors.
  - Market free-open rate underlies probability of new competitors enter, existence of market barriers, reaction of enterprises to new competitors enter.
  - Character of target customer groups: their number and structure, demand conditions and its change trend, customer severity.
  - Suppliers' quality and reliability: level of supply chain management, availability and structure of supplier, their bargaining power.

Analysis of market environment factors enables to identify opportunities and threats for target market of the enterprise.

## 1.3 Internal competitive factors of enterprises

- *Product innovativeness*: innovations evoking new demand are needed. The most successful products are providing new benefits to customer.
- *Delivery reliability and flexibility* require permanent monitoring customer satisfaction indicators: timeliness, complexity and quality of deliveries.
- *Value perceived by customer*: enterprises transferred their attention from standardized production to adapted products to certainly defined customer segments.
- *Trained and motivated employees*: qualification, productivity, involvement, interpersonal relationship, team work with their influence on business performance and competitiveness.
- *Production processes*: using modern Technologies, production organization, methods and techniques of process improvement, maximalising production after orders.
- *Quality and technical level of products*: implemented quality management systems ISO...



- *Management system*: application of modern management approaches based on process, knowledge management and lean management principles.
- *Suitable competitive advantage* chosen on the base of detailed competitive environment and business portfolio analyses.
- *Financial situation in enterprise*: sufficient liquidity and cash-flow covering interests of invested capital, profit for covering new investments.
- *Productivity* as a rate between process output and inputs of needed sources. The most important is labour productivity as a rate of produced products and labour length.
- *Export performance of enterprise* determines a success on foreign markets.
- *Marketing mix quality*: product price level, using sale support forms, granting after sales services, building corporate image, reclamation processing, using e-business.

## 2. Evaluation of competitive factors in Slovak wood processing enterprises

Slovak wood processing industry has a comparative advantages resulting from sufficient resources of domestic raw wood material. Production capacities of wooden enterprises are able to process wood assortments produced on domestic market. Enterprising subjects of wood processing industry in SR present approximately 7,3 % from total industrial revenues. Wood enterprises are focused on processing primary raw wood and products determined for next processing into final products.

### 2.1 Evaluation of external macroeconomic factors

On the base of data from global competitiveness report there exist factors lowering and factors supporting business competitiveness in SR showed in table 1.

Table 1 Macroeconomic competitive factors in SR

<i>Factors lowering competitiveness</i>	<i>Factors supporting competitiveness</i>
High level of clientele	Opened to foreign ownership
Low law enforcement	Legislation supporting investments income
Low public trust to correctness of statesmen	Opened foreign investments bringing new technologies
Low public expenditures efficiency	Low terrorism risk
Low flexibility of labour legislation	Low interest rate fall

Source: Global economic forum: Report of global competitiveness 2011

### 2.2 Evaluation of external microeconomic competitive factors

External competitive factors in Slovak wood processing enterprising have been analyzed on the base of data from Ministry of Economy and Bureau of Statistics (detailed analyses has been published by authors<sup>2</sup>). Identified factors are shown in table 2

<sup>2</sup> Rajnoha, R. a kol. (2008): Zvyšovanie konkurenčnej schopnosti podnikov drevospracujúceho priemyslu SR s využitím efektívnych prístupov a nástrojov riadenia podnikov; Sujová, A. (2005): Aspekty reštrukturalizácie drevárskych podnikov; Sujová, A. (2008): Opportunities and threats for woodprocessing companies of European Union.

Table 2 Microeconomic competitive factors of wood processing enterprises SR

<i>Factors lowering competitiveness</i>	<i>Factors supporting competitiveness</i>
Inoperative cooperation with wood producers	Independence from material inputs import
High export rate of raw wood	Low costs by raw wood purchase
Exclusion from EU funds support	Good qualification structure of labour power
Absence of entrepreneurial infrastructure	Enter of important foreign investors
Low level of technical infrastructure	Government supporting programs for WPI
Lower prices of competitors from the third countries	Ecology and low energetic absorption in production
Demand decrease for wooden products	Good level of knowledge infrastructure

Source: aligned after Ministry of Economy SR and Eurostat

## 2.3 Evaluation of internal competitive factors in wood processing enterprises SR

Internal competitive factors of wood processing enterprises SR have been analysed via primary research by questionnaire in 80 wood processing enterprises SR. In regard to limited paper range we present achieved results in research in table 3.

Table 3 Internal competitive factors in wood processing enterprises SR

<i>Factors lowering competitiveness</i>	<i>Factors supporting competitiveness</i>
Low liquidity and solvency	Products and production quality (ISO norms)
Insufficient product and technologic innovations	Flexibility in customer requirements adapting
Low economic power and investment sources	Export production rate (60% )
Insufficient trade and marketing activities	Qualified human resources
Ineffective using production capacities	Growing labour productivity
Functional system of management	Products price level

On the base of identified competitive factors in Slovak wood processing enterprises we can consider following **competitive advantages** of wood processing enterprises SR within WPI EU: *raw wood costs, labour power costs, sufficient possibilities for scholarly preparation and education of employees.*

## 3. Competitive factors as a base for business performance

Increasing process performance with aim to increase an added value for customers belong among basic strategic goals in modern enterprises. In the present time have been supported new approaches to watching business performance which come out traditional system and fill up them in further qualitative and timing indicators. A modern way of performance evaluation is based on prerequisite that a company is productive by ability to reach defined strategic goals not only financial. In practice are applied two basic approaches: Balanced Scorecard as a system for evaluation of strategic goals in four basic areas (financial, customer, internal processes and learning and growth. The second approach is based on measurement of performance through measurement of business processes performance and it is known as Performance Management.

Actual competitive factors present basic starting points for possibilities of performance increase. As for Slovak wood processing enterprises possibilities for performance increase can be characterized as follows:

- Implementation of an effective cooperation with wood producers through common cooperative conception based in law prescriptions.
- Improving entrepreneurial infrastructure through creation of wood processing cluster or cooperating partnerships.
- Creating added possibilities for wood product using and new added value for customers
- Technology and labour productivity increase.
- Implementation of process principles in management systems.
- Implementation of software and information systems supporting process management
- Acceleration of product innovations, implementation of product innovation system into business management.
- Update in using sale forms and marketing tools.

## Conclusion

Factors and processes determining business competitiveness and next development in present intensive globalization processes have been permanently changing. The enterprise can increase its competitive advantage through benefit increase or expenditures lowering for customer. Determining competitive factor innovation ability and innovation realization speed is considered. To increase or to keep business competitiveness on present globalized market has been forcing enterprise to search new non-priced competitive advantages and to transfer their attention from cost and price reducing to increase of added value provided to customer. Slovak wood processing enterprises should pay attention especially to innovation activity increase. Accelerating implementation of product, process, technologic a systemic innovation into practise requires support of all enterprise activities on regional and national level that enables also to increase performance of Slovak wood processing enterprises.

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# SELECTED ASPECTS OF PEOPLE'S INVOLVEMENT TO QUALITY MANAGEMENT SYSTEM IN THE WOOD PROCESSING COMPANY\*

*Anna Štefančíková*

## **Abstract:**

The subject of this paper is the issue of introducing a quality management system in company practice. In order to create a successful quality management system it is inevitable to balance processes, people and technologies. The paper is concerned with the problems of people involvement and their competence in quality management systems.

## **Key words:**

quality management principles, people involvement factors, leadership, organizational culture, competence, creativity

## **1 Quality management principles from a human perspective**

Although involvement of people is vital for the efficient implementation of a quality management system, its consequences are sometimes underestimated forgetting that people at all levels are the essence of every organisation and their full involvement enables their abilities to be used for the organisation's benefit. Whereas processes and technologies are usually optimally designed and guaranteed, people sometimes represent weak spots and this is why they deserve our increased attention. Although the ISO 9000: 2005<sup>1</sup> standard considers in its eight quality management principles the competence and involvement of people as being inevitable for the efficiency and effectiveness of the system operation, an increased awareness of human factors in quality management and optimized involvement of all people engaged undoubtedly leads to an improvement in the ability to meet requirements and ultimately to customer satisfaction.<sup>2</sup>

First of all, it should be understood that every quality management principle represents a comprehensive and fundamental rule or belief for leading and operating an organisation which is aimed at the continual improvement of performance over the long term by focusing on customers while addressing the needs of all other stakeholders. By applying the following eight quality management principles organisations will produce benefits for customers, owners, people, suppliers, local communities and society at large<sup>3</sup>

### **Principle 1 – Customer focus**

Organisations depend on their customers and therefore should understand current and future customer needs, meet customer requirements and strive to exceed customer expectations.

#### ***Application of this principle leads to the following actions:***

- breaking down barriers between customers and people within the organisation to improve relationships and communication;

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<sup>1</sup> CEN/TS 15224: 2005 Health Services. Quality Management Systems. Guide for the use of EN ISO 9001: 2000

<sup>2</sup> ISO 10001:2007. Quality management – Customer satisfaction – Guidelines for codes of conduct for organizations.

<sup>3</sup> Proposal for a Decision of the European Parliament and of the Council establishing a Programme of Community action in the field of Health and Consumer protection 2007 – 2013

- improvement of understanding of customer needs and expectations for products, delivery, price, dependability, after sale services etc.;
- improvement of understanding of customer needs and expectations by people not directly dealing with customers and so understanding the value chain operating within the organisation;
- measuring and communicating results of customer satisfaction and so improving customer satisfaction and related processes.

***Beneficial applications of this principle include:***

- improvement of policy and strategy formulation;
- aligning relevant goals and targets with customer needs and expectations;
- operational management improvement with the aim to meet customer needs and customer satisfaction;
- improvement of human resources management by ensuring people that they have the competence required to satisfy the customer needs.

**Principle 2 – Leadership**

Leaders establish unity of purpose and direction of the organisation. They should create and maintain the internal environment in which people become fully involved in achieving the organisation's objectives.

***Application of this principle leads to the following actions:***

- establishing a clear vision of the organisation's future and sharing it with the people;
- establishing shared values and ethical role models with all people of the organisation, understanding and responding to changes in the external environment and explaining these changes to all affected people ;
- being proactive and leading the people of the organisation by example, balancing the needs of all stakeholders including customers, owners, employees, suppliers, local communities and society at large;
- educating, training and coaching people;
- providing people with the required resources and a freedom to act with responsibility and accountability;
- promoting open and honest communication among people;
- inspiring, encouraging and recognizing people's contribution;
- building trust and eliminating fear;
- sharing the setting of challenging goals and targets;
- implementing strategy to achieve these goals and targets.

***Beneficial applications of this principle include:***

- establishing and communicating a clear vision of the organisation's future and explanation of its policy, future and mission ;
- translation of the organisation's vision into objectives and measurable goals and targets;
- reviewing and improving the processes of the organisation;
- providing role models for people within the organisation.

***Application of this principle leads to the following actions :***

- active looking for opportunities to enhance their competencies, knowledge and experience;
- being innovative and creative in furthering the organisation's objectives;



- focusing on the creation of value for customers;
- feeling empowered to accept ownership and responsibility to solve problems;
- active seeking opportunities to make improvements;
- active sharing knowledge and experience in teams and groups.

***Beneficial applications of this principle include:***

- creation of peoples' behaviour and believe consistent with the organisation's policies and strategies;
- people sharing ownership of the organisation's goals;
- people taking appropriate decisions and improving processes they are involved in;
- people satisfaction with their jobs, their active involvement in their personal growth and development and being enthusiastic and proud to be part of the organisation.

**Principle 3 – Process approach**

A desired result is achieved more efficiently when related resources and activities are managed as a process.

***Application of this principle leads to the following actions:***

- identifying internal and external customers, suppliers and other stakeholders of the processes;
- determination of people defining processes they are responsible for to achieve desired results;
- determination of clear responsibilities for people, their authority and accountability for managing processes;
- nomination of people identifying interfaces of processes interrelated with other processes and functions of the organisation;
- nomination of people identifying and measuring inputs and outputs of various processes;
- nomination of people evaluating possible risks, consequences and impacts of processes on customers, suppliers and other stakeholders of processes;
- when designing processes, considering process steps, activities, flows, control measures, training needs, equipment, methods, information, materials and other resources to achieve the desired results.

***Beneficial applications of this principle include:***

- better assessment of more predictable results, better use of resources, shorter cycle times and lower costs;
- aligning goals and targets across functions of the organisation in an integrated way;
- increasing sense of responsibility, lowering costs, preventing errors, reducing cycle times and providing more predictable outputs;
- people understanding of their positions in the organisation and in its processes.

**Principle 4 – System approach to management**

Identifying, understanding and managing a system of interrelated processes for a given objective improves the organization's effectiveness and efficiency.

***Application of this principle leads to the following actions [9]:***

- better understanding of interdependencies among processes creating the system;
- structuring the system to achieve overall organisational objectives in the most effective and efficient way;

- development of the system through identification and development of processes that affect organizational objectives;
- support of people continually improving the system through measurements and evaluations.

***Beneficial applications of this principle include:***

- creation of an organization-wide understanding of how the it can succeed;
- understanding that individual, functional and process goals are intended to support overall organization goals;
- managing, aligning and improving individual activities and processes with the aim to support the system as a whole;
- providing a better understanding of roles and responsibilities for achieving system-wide objectives, reducing cross functional barriers and improving teamworks.

**Principle 5 – Continual improvement**

Continual improvement should be a permanent objective of the organization.

***Application of this principle leads to the following actions:***

- continual improvement of products, processes and systems becomes an objective for every individual in the organization;
- introduction of the basic concepts of incremental and breakthrough improvements;
- continual monitoring and measuring of areas suitable for potential improvements;
- continual improvement of the efficiency and effectiveness of all processes;
- promotion of prevention based activities;
- provision of appropriate education and training to every member of the organization, specifically in the methods and tools of continual improvement such as the Plan-Do-Check-Act cycle, problem solving, process re-engineering and process innovation;
- establishing measures and goals to guide and track improvements;
- recognizing improvements and evidence of success.

***Beneficial applications of this principle include:***

- achievement of a culture of continual improvement as a source of competitive advantage;
- setting realistic and challenging improvement goals and providing resources to achieve them;
- continual improvement of effectiveness and efficiency of processes across the organization;
- involvement of all people in the organization in continual improvement methods, tools, opportunities, and their encouragement to improve products, processes and systems.

**Principle 6 – Factual approach to decision making**

Effective decisions are based on the analysis of data and information.

***Application of this principle leads to the following actions:***

- agreeing on objectives, taking measurements, collecting data and information relevant to the objective;
- ensuring data and information are sufficiently accurate, reliable and accessible;
- analysing data and information using valid methods;
- understanding the value of appropriate statistical techniques;

- providing results of analysis in a form that can be understood and acted upon;
- making decisions and taking actions based on the results of logical analysis balanced with experience and intuition.

***Beneficial applications of this principle include:***

- developing strategies based on relevant data and information, being realistic and understood by the people in the organisation;
- using relevant data and information to set realistic and challenging goals and targets;
- using data and information to improve understanding of process and system performance and system performance to guide improvements and prevent future problems;
- increasing competence of people through using data to improve processes and operations.

**Principle 7 – Mutually beneficial supplier relationships**

An organization and its suppliers are interdependent and mutually beneficial relationship enhances the ability of both to create value.

***Application of this principle leads to the following actions:***

- involving people within the organization in identifying and selecting key suppliers and thereby using their knowledge and experience;
- establishing open, clear and honest two way communication with suppliers to exchange information in order to jointly understand each other's needs and capabilities;
- involving individuals and groups at the supplier organization with people in one's own organization in teams undertaking joint development and improvement of products and processes;
- recognizing and rewarding efforts and achievements of individuals within the supplier organization;
- establishing and building relationships with suppliers balancing short-term gains with long-term considerations for the organization, its people and society at large.

***Beneficial applications of this principle include:***

- creation of a competitive advantage through development of strategic relationships with suppliers;
- establishing more challenging goals and targets through early involvement and participation of suppliers and people in the organization;
- creating and managing relationships between suppliers and the people in the organization to ensure reliable, on-time, defect-free delivery of supplies;
- improving supplier capabilities through supplier training and joint improvement methods.<sup>4</sup>

The implementation these principles of quality management system according and consideration of human factors to improve the efficiency of management of any company, including companies focused on the woodworking industry.

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<sup>4</sup> IWA 1 Quality Management Systems. A Manual on Improving Processes in Organisations Providing Health-care Services, Bratislava, SÚTN 2005

## 2 Human factors

The foregoing principles of quality management indicate a number of human factors that need to be addressed when developing a quality management system. To increase participation and competence of the people in organization the following three groups of human factors should be considered:

Tab. 1 Human factors in management qualite<sup>5</sup>

LEADERSHIP FACTORS	COMPETENCE FACTORS	PEOPLE INVOLVEMENT FACTORS
<ul style="list-style-type: none"> <li>• leadership</li> <li>• organisational culture</li> <li>• change management</li> <li>• knowledge management</li> </ul>	<ul style="list-style-type: none"> <li>• recruitment</li> <li>• education and learning</li> <li>• competence</li> <li>• creativity and innovation awareness</li> </ul>	<ul style="list-style-type: none"> <li>• communication</li> <li>• networking and collaboration</li> <li>• teamwork</li> <li>• discipline</li> <li>• empowerment and responsibility</li> <li>• recognition and rewards</li> </ul>

One aspect of people involvement when teams and individuals have demonstrated competence in achieving organizational objectives is by managers within the organization allowing them authority to organize their own work. Empowerment is the process that provides employees with the authority and ability to make decisions about their work. Employee empowerment helps employees serve customers at the level of the organization where the customer interface exists and where also responsibility of people is questioned.

Where individuals and teams have been involved in successful work for the benefit of the organization, it helps developing an effective culture when the organization recognizes and rewards their contribution. This leads to greater motivation, loyalty and effort from recognized employees along with increased performance, thereby improving a competitive advantage.

Many years lasting experiences with the implementation and realization of quality management systems prove that numerous failures were due to insufficient engagement of managers and other people in organizations and by the underestimation of human factors in organizations. Any successful functioning of every quality management system therefore must create a balance among processes and engaged people and so offer an environment for possible changes.<sup>6</sup>

## 3 Management of competence and people involvement

The eight foregoing management principles indicate the importance of people involvement and the need of their competence. This is why organizations should establish, document, implement and maintain processes for competence acquisition and people involvement and continually improve their effectiveness.

The **competence acquisition process** aims at ensuring that the appropriate competence is developed with regard to the needs of the business activities. This involves managing, developing and maintaining the organisation's ability to achieve its objectives. At the same time the organization should create the necessary conditions for participation and involvement of all employees including stakeholders in the process. It should be emphasized that the involvement of people is not only the key to the success of the quality management

<sup>5</sup> JURAN, G.: *Juran's Quality Handbook*. McGraw-Hill International Edition, 2000, p. 96.

<sup>6</sup> ŠALGOVIČOVÁ, J. – ŠTEFANČIKOVÁ, A.: *Marketing processes*. Łódź : Księży Młyn, 2011, p. 173

system but of the whole organization. At the same time it must be clear that the competence acquisition process is not a simple procedure and so it must be systematically managed. Nevertheless it finally brings a competitive advantage when recruiting new employees and increasing their satisfaction. It also brings for them new opportunities when selecting jobs.<sup>7</sup>

The competence acquisition process should commence with the analysis of competence needs by using inputs such as business plans, policy and guidelines from interested parties. The existing competence for each employee is thereby mapped out and this creates the knowledge of existing competence and a record of existing competence for the organization. Identified competence gaps are then recorded and competence acquisition plans are created for every employee, realized and evaluated. A record of any successive corrective and preventive action is then created and maintained.

In order to ensure management system effectiveness top management must make effective choices of **people and their involvement** in various activities. When used in combination with problem solving, decision making and project management processes, effective people involvement is a powerful tool for continual improvement. At the same time it should be understood that the people involvement process should be an integral part of the whole process approach and should start from identification of personal or group objectives for planned activities, then should proceed to identification of persons to be involved, their selection, effective communication with them and finally should be closed with evaluation of their outcomes.

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<sup>7</sup> ŠTEFANČIKOVÁ, K.: Building of strategic alliances - a new trend in global business, *QUAERE 2012*, p. 348.

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# THE APPLICATION OF THE OPEN INNOVATION CONCEPT IN THE FURNITURE INDUSTRY

*Anna Zaušková – Adam Madleňák*

## **Abstract:**

The key element in the knowledge economy development lies in intensifying and deepening the mutual cooperation between businesses and other participants of economic market. In this scientific paper the authors deal with the issue of the innovation process effectiveness in the furniture industry. They present the reader the open innovation system as a new concept of cooperation among firms in the furniture industry leading to increase of their innovation performance, competitiveness and production quality on the market.

## **Key words:**

furniture market, competitiveness, open innovation, innovation process, crowdsourcing

## **Introduction**

The wood-working industry<sup>1</sup> is one of the largest industries in the European Union. Rich resources of wood in individual countries create favorable conditions for work development with the wood almost at all economy levels. Special specific position in the wood processing sector belongs to the furniture industry. Furniture is supposed to be a commodity with the highest added value for the customer, with respect to wood products. Up to 40 % of world furniture production comes from the European Union countries<sup>2</sup>. The industry is dominated especially by micro enterprises<sup>3</sup>, which are often subcontractors of the semi-finished products determined for the final completion by larger firms.<sup>4</sup> The furniture industry is considered to be an assembly industry, which uses besides wood and wood-based panels even a wide range of components made of metal, plastic, various textiles, leather and glass. The European furniture industry is currently characterized by a high quality of offered products and it has built a considerable reputation worldwide.

## **1 Furniture industry in the Slovak Republic**

Sufficiency of wood in the Slovak Republic and continuously increasing level of stocks in forest stands condition the coverage of most domestic inputs into the production in the furniture industry solely from its own resources. Compared with other European countries the Slovak furniture industry is still characterized by relatively low rate of technology development and manufacturing of wood products. Outdated technology and inefficient work practices in many cases require large financial investments mainly in the field of production processes automation in order to standardize their own production. Foreign investors often

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<sup>1</sup> It includes a number of sub industries focusing on wood processing, furniture manufacturing, pulp and paper.

<sup>2</sup> The main producers of furniture are especially Italy, Germany, Great Britain, France, Spain and Poland. The share of furniture industry in individual countries of the European Union produces an average of 2-4 % of the value of the manufacturing sector, which represents approximately 2 % of GDP and from 2 to 2.2 % share of total employment. The share of the furniture industry creates 2.3 % of the overall economy in Slovakia.

<sup>3</sup> Up to 86 % of furniture companies in the European Union have fewer than 10 employees.

<sup>4</sup> Available at: <http://archive.europe-innova.eu/servlet/Doc?cid=8198&lg=EN> (12.3.2012).

help to realize faster changes. They try to use the potential in wood processing in our country and its subsequent export.

Recently a negative impact of the global economic crisis has become a significant obstacle in the inflow of foreign capital into the furniture industry development. As the demand for wood products can be considered as a derived demand and it essentially depends on the development of other industries. Their unfavorable growth can fundamentally influence furniture sales on the market. This results in suspension or postponement of the planned housing development or significant development projects realization due to lack of funds during the ongoing crisis. The crisis has caused reduced demand for wood products needed for their equipping. Furniture is the product of long-term consumption and therefore providing significant price discounts may not always attract potential customers and persuade them to exchange the older furniture. Moreover, the growing pressure of foreign competitors, especially import of cheap furniture from Asian countries<sup>5</sup>, also contributes to failure and often bankruptcy of Slovak firms producing furniture primarily in the retail sector. Since 2008 an unwanted effect of described factors has caused the total fall of furniture production about 20 to 30 % in the Slovak Republic.<sup>6</sup> Difficulties have also begun to appear more often in providing the professional training and supporting young people's interest in working in the woodworking industry.

At the moment several large and relatively successful furniture manufacturers<sup>7</sup> operate in our country. Their production is mainly concentrated on meeting the needs of multinational retail chains<sup>8</sup> that help to support products sale on the domestic market. The industry is still characterized by typical and numerous small manufacturing operations and sole traders<sup>9</sup> with mostly regional scope. Reaching economic results by subjects from the pre-crisis period requires their ability to adapt to changing conditions. Preserving the unique characteristics of the manufacturing process, its improvement and effective evaluation on the market becomes a challenge for perspective growth of the entire furniture production.

The key factors influencing the competitiveness of entrepreneurs are primarily research and innovations, production quality, design and added value of products and a positive image of the producer. By now neglected elements such as particularly modern information technologies or complex logistic systems are getting forward in the wood processing industry. However, even in times of mass culture it is not possible to satisfy everybody by actual trends.

## **2 Innovation trends in the furniture market**

Each innovation predestinates furniture for still new target groups of potential customers. When choosing the furniture they are influenced by constantly evolving technologies, working procedures and culture that shape their lifestyle. The growing

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<sup>5</sup> In 2011 the furniture import from China to Europe was about 46.9 % higher than in 2005. However, the total value of imported furniture increased only about 12.6 % compared to data from 2005.

<sup>6</sup> Available at: <http://www.etrend.sk/trend-archiv/rok-2011/cislo-39/kriza-dalej-orezava-zisky.html> (14.3.2012).

<sup>7</sup> In Slovakia among the most famous furniture producers belong companies Decodom, Ekoltech, Swedwood, Furni Finish etc.

<sup>8</sup> IKEA, Kika, Sconto, Asko etc.

<sup>9</sup> According to the Trade Register of the Slovak Republic more than 11,000 sole traders specified furniture production or joinery as the subject of business.

importance of creative solutions to existing problems allows reflecting immediately on rapidly changing requirements of economic market.

In the current period of global crisis many furniture companies need to realize restructuring of established business models, including the well-established methods of production process management in order to enhance work efficiency and production rationalization. Realized production process innovations are mostly related to production technology automation in the furniture industry. Fast and cheap innovations become a fundamental requirement in order to preserve and maintain their share in the highly competitive market environment. An effort to produce products with improved physical and chemical properties or high stability parameters with regard to their structure is a very important innovative trend. Producers are primarily focused on acquiring new ways of wood modification, its protection against excessive moisture, weather resistance and impact. It is also important that the material needed for furniture production has increased thermal and sound isolation. The role of producers is to change the wood properties in order to extend the current range of its usage as a suitable substitute product. The emphasis on further education and qualification improvement of employees in the wood processing sector is also used to increase the competitiveness of the subject on the economic market. Improving of provided services level contributes to creating favorable relationships with clients in comparison with competition.

Innovations are worldwide supposed to be one of the key factors for the development of modern society. Particularly their contribution to increasing economic growth and competitiveness of the country seems to be principal in the products and services supply. The effort of the European Union that is taken into account in many strategic documents<sup>10</sup> and political initiatives is therefore to make such an environment that would help to create and improve those innovations.<sup>11</sup> Utilization of financial sources from existing community programs<sup>12</sup>, that are intended to encourage innovation, is rather complicated in practice and it does not often lead to desired results, mainly in cases of creative and ambitious projects that are characterized by high rate of internal risk, so called risk capital. Because of this reason the European Commission requires European Union member states to make a significant regulation of national laws in terms of accepting the framework conditions to support innovation processes. The urgency of supporting and maintaining a sufficiently high level of innovation becomes an integral part of national development plans of individual European Union countries.

Although there are several disproportions between the political strategies at the supranational level, which seriously threaten the competitiveness and profitability of wood processing industry sector. By now European institutions as the part of the European Union have dealt with so called *critical materials*<sup>13</sup> rather than with the wood usage in the area of material processing. But the wood is also playing a key role in development of many products which provide solutions to environmental problems. Therefore the forming European

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<sup>10</sup> The Europe 2020, The Lisbon Strategy, The Amsterdam Strategy etc.

<sup>11</sup> ŠVEC, M.: Európsky sociálny dialóg. In: *Europeizácia a transnacionalizácia pracovných vzťahov*. Plzeň : Aleš Čeněk s.r.o., 2009. p. 244-247.

<sup>12</sup> The Seventh Framework Programme for research, technological development and demonstration activities (FP7), The Competitiveness and Innovation Framework Programme (CIP), The EUROSTARS Programme, The LIFE+ Programme etc.

<sup>13</sup> The critical materials are characterized by high risk of their insufficient supply in the market and the low degree of substitutability. The most popular ones are antimony, cobalt, graphite, magnesium, various kinds of rare earths and others. Their impact on the economy is higher compared to most other materials.

innovation partnership<sup>14</sup> should remove obstacles in European systems for research and development, even in other input materials for production such as wood, metal ores or various industrial and construction minerals.<sup>15</sup>

Practical satisfying the specific needs of mainly smaller companies in the furniture industry disregards the technological platform of the forestry economy. Complicated and excessively given conditions in research cooperation do not allow the furniture manufacturers effectively participate in many international projects. The ERA-NET, resp. M-ERA.NET have become a successful pioneer in the support and development of innovative efforts of SMEs. They focus on experience exchange and coordinate research activities in material and technology disciplines even at regional level.<sup>16</sup>

The Slovak Republic has not built up a complex innovation system that could effectively be used, so far. The issue of knowledge economy deals with a number of strategic documents<sup>17</sup>, but we missed any desirable political initiatives coordination and their implementation at the highest organizational level of public administration.

### **3 Open innovation – chance for furniture market development**

The growing demand for competitiveness makes entrepreneurs increase their production rate. Gradual unification of global economic market through the removal of different customs or legal barriers results in a need for immediate companies' adaptation to changed conditions in business activities which are mainly characterized by rapid innovation trends. Many competitive strategies of big furniture producers and distributors have obviously changed. Entrepreneurs' effort to independently develop new products that would be attractive to the market reduces their ability to reach potential customers on time. Lack of free financial capital needful for development of planned investment projects, resp. their overall financial burden, also influences negatively the progress and effectiveness of research realized exclusively in the company's internal environment. Business representatives are thus forced to a more effective treatment with the resources intended for development of potential business opportunities. One of perspective possibilities of economy re-growth is its opening to the external environment in order to build cooperation and involvement in the process of new ideas creating with other external subjects of economic market. Accessing of the innovative ideas, new technologies and processes flow among the market players mutually gains the fundamental importance. Producers are mainly interested in sustainable processes in material production that could meet the requirement for comfortable and beautiful furniture for relatively long time periods. In practice we can talk about establishing the system of "open innovation".

Most experts indicate that the company's ability to absorb relevant knowledge and ideas from external sources, and then to produce new products or services regarding the

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<sup>14</sup> The European Commission approved the European innovative partnership of raw materials 2/29/2012.

<sup>15</sup> EUROPEAN COMMISSION: *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Making raw materials available for Europe's future well-being. Proposal for a European innovation partnership on raw materials. COM(2012) 82 final.*

<sup>16</sup> Available at: <https://connect.innovateuk.org/web/m-era.net> (18.3.2012).

<sup>17</sup> In Slovakia a key document in innovation supporting is *The Innovation Policy of the Slovak Republic for the years 2011 - 2013 in the Ministry of Economy resort*. Its aim is to develop better more arrangements of *The Innovation Strategy of the Slovak Republic* until 2013 etc.

market needs is a crucial tool important for its growth potential. The variety of interesting initiatives and increased possibility of their application in various industries predestines the concept of open innovation to be a modern approach of building a constructive dynamic market environment.

Chesbrough says that open innovation can be understood by a company as "*a deliberate use of internal and external knowledge flow to accelerate innovation and market expansion.*"<sup>18</sup> Practical implementation of the open innovation model assumes acceptance and further development of the ideas of other authors from the external environment. Imaginary boundaries of the company's organizational structure which is governed by the open innovation concept, becomes permeable, so there is an extended space for finding new incentives and attractive ideas. More entrepreneurs emphasize on individual experience and perceptions of their customers. Users also can become co-creators of the product value and they have more personal relation to it. Open innovation models also emphasize the importance of universities, research institutions and their own competitors in finding appropriate solutions to existing problems.

The aim of this cooperation is the usage of available patents and license to allow sharing of others' innovation potential, often for objective and subjective reasons, less competitive subjects. It is important to point out mutual interconnectivity of more industrial sectors, which may reciprocally influence in response to different degree of achieved quality of production processes.<sup>19</sup> Established innovations originally used in different conditions may find its application even in the furniture industry.

Successful application of open innovation system in practice also conditions enabling own ideas and innovations that the company does not use enough to the public, providing mutually beneficial terms. Giving allowance to use them by other businesses, the company can obtain extra income from its own research.<sup>20</sup> However, it must find a suitable opportunity, resp. mechanism that can available ideas use better compared to its own evaluation.<sup>21</sup>

By enforcing an open approach the innovation processes become more interactive regarding the participation of a broad group of participants with different knowledge. The dynamics and complexity of the whole process cause parallel complementarity of the involved scientific research results depending on the character and nature of partial needs and the available solutions to problems. In terms of huge amount of new discoveries, inventions and patents the concept of open innovation can be understood as a unique tool that can help the company to effectively reduce the high degree of uncertainty which arises in the given technological development.

A British online retailer of furniture and home accessories *Made.com* presents an interesting practical application of the innovation concept in the furniture industry. The company tries making potential customers interested in research and creative management of

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<sup>18</sup> CHESBROUGH, H. – VANHAVERBEKE, W. – WEST, J.: *Open Innovation: Researching a new Paradigm*. Oxford : Oxford University Press, 2006. p. 18.

<sup>19</sup> SLOANE, P.: *A Guide to Open Innovation and Crowdsourcing: Advice From Leading Experts*. London : Kogan Page, 2011. p. 60-64.

<sup>20</sup> The company can enable not only the results of the own research which does not use fully, but also those ones that are the subject of its and they have the potential of successful application in another economic area or sector.

<sup>21</sup> CHESBROUGH, H.: *Open innovation: The New Imperative for Creating and Profiting from Technology*. Boston : Harvard Business School Press, 2003. p. 48-54. Look also – SKARZYNSKI, P. – GIBSON, R.: *Innovation to the Core: A Blueprint for Transforming the Way Your Company Innovates*. Boston : Harvard Business School Press, 2008. p. 86-93.



the whole innovation process. It radically disrupts the traditional perception of the research activities of entrepreneurs by using so-called crowdsourcing<sup>22</sup> as a specific form of open innovation.

*Made.com* invokes the public to cooperate in designing and developing its full range of products. Its product portfolio consists exclusively of goods reflecting the consistency of the latest innovative trends in the furniture market with the lifestyle of its customers. Visitors of the company website have the opportunity to submit their own dream furniture proposals. They regard a multiplicity of individual experience, ideas and long-term established practices that can ensure the structure uniqueness and design originality of the proposed product. At the same time they also contribute to the completion of other hardly realized proposals of the furniture. The mentioned way allows them to gain reward for the design solution which is selected by *Made.com*. Successful designers benefit from the project which is prosperous in the market in the form of a 5 % share of its sales price. Possible additional costs to complete its own final product will be borne by the company. A major advantage of the open innovation model rests in a significant reduction of money spent on internal research and product development.<sup>23</sup> *Made.com* also gets a lot of interesting ideas in a relatively cheap way and from a quite broad base of external sources. However, the best ideas often come from environment where the idea of finding an appropriate solution is absolutely unexpected.

The company cooperates with the rest of the community of its website users. It offers them the opportunity to vote for the best product model which will be available in the next period exclusively custom-made. Mass production of furniture only in the number of in advance ordered pieces allows the company *Made.com* to optimize costs volume given to the goods production. An innovative method of furniture producing and selling through the internet enforces the fact that the firm has no surplus resources or stocks of supplied products. Furniture is made in China, and then it is delivered directly to concrete candidates. Individual production of each product extends its delivery period about several weeks, the multi-distribution with agents is eliminated, but *Made.com* can reduce the price of the finished product about more than 50 % compared with traditional selling methods.<sup>24</sup> Combination of crowdsourcing and a direct distribution allows the company *Made.com* to produce furniture of high quality at relatively affordable prices.

## Conclusion

The need to support the wood processing industry primarily by economic reforms aimed at improving production processes and product promotion appears to be necessary nowadays. Particularly in the furniture industry outdated working processes have a significant impact on the relatively low growth of products' added value for customers. The requirement of subject's flexibility in the business environment is an important prerequisite for adaptation to the current innovation trends.

Lack of material and personnel sources forces SMEs and also large companies to change established model of financial support for innovation science, research and development. Businesses must effort to find such models of research collaboration, which are primarily based solely on the use of internal resources, but the necessary financial and human resources, and draw from the external environment. Using the principles of open innovation

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<sup>22</sup> Crowdsourcing consists in solving the given problem by not closer specified group of people (the public) following the general challenge.

<sup>23</sup> The company does not have to establish own research centre, resp. to employ a large team of developers.

<sup>24</sup> Available at: <http://www.made.com/> (20.3.2012).



in the Slovak furniture industry can help domestic producers become more competitive in the European economic market.

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**CHAPTER 2**

**ECONOMY AND BUSINESS**

# ECOLOGICAL AND ECONOMIC BENEFITS FOR USAGE OF WOOD FUELS FOR HEATING PUBLIC FACILITIES IN SERBIA AND THEIR CONTRIBUTION TO THE CLIMATE CHANGE MITIGATION

*Branko Glavonjić – Predrag Sretenović*

## **Abstract:**

In order to observe the effects of use of wood energy for the purpose of this paper, the survey of fuel consumption for heating of all school buildings in Serbia was conducted. In this aim, the surveying of 4,892 school buildings in 24 districts in Serbia was conducted. Out of that number, 2,324 school buildings are using coal or combination coal/wood for purpose of heating. In the aim of analyzing the ecological and economic effects of conversion of coal with wood fuels, the data on energy value of all types of coal used in these school buildings, as well as their procurement prices were collected. Based on executed calculations, the total demands for energy for heating as well as the total costs of heating in all the school buildings using coal in Serbia were obtained. Benchmark analysis of quantities showed the ecological and economic effects of conversion of coal with wood fuels for school buildings in all districts in Serbia.

## **Key words:**

ecological, economics, benefits, climate change, wood fuels

## **1. Introduction**

Experiences of European Union countries in which woody biomass has a significant role and share in the total production and consumption of energy show that the Government had a major role in the success and development of wood fuel market. The Government role consisted on one side of creation of policy, secondary legislation, rules and incentives for participants in that process. On the other side, through their own initiatives and activities, the Governments of these countries realized a number of projects in which institutions of public significance became big users of wood fuels and in this way example of good practice in the field of wood fuels. In Austria for instance, there are numerous examples of good practice on which it is possible to see all the effects of use of woody biomass (economic, social and ecological).

The Government of the Republic of Serbia has up to date done very little in the practical implementation of numerous documents, strategies and Action plans. Namely, the Government of Serbia through its Ministries and Agencies enacted several laws, decrees, documents, as well as feed-in tariffs for the production of electricity from renewable sources and Biomass Action plan.

## **2. Scope of work and objective**

Scope of research in this paper are school buildings in Serbia. The main objective is to determine consumption of particular forms of wood fuels (in quantitative and energetic sense), which are used for heating purposes in school buildings in Serbia. Beside that, special objective

of this paper is to research, analyze and examine effects of fossil fuels replacing with wood ones in those school objects, where fossil fuels are still used for heating purposes.

### 3. Research methodology

In order to observe the effects of use of bio-energy, especially wood energy, for the purpose of this report, the survey of fuel consumption for heating of all school buildings in Serbia was conducted. In this aim, the surveying of 4,892 school buildings in 24 districts in Serbia was conducted. Out of that number, 2324 school buildings are using coal or combination coal/wood for purpose of heating. Total quantity of coal consumed in these buildings in the heating season 2010/2011 was 37,837 tonnes. In the aim of analyzing the economic effects of conversion of coal with wood fuels, the data on energy value of all types of coal used in these school buildings, as well as their procurement prices were collected. Based on executed calculations, the total demands for energy for heating as well as the total costs of heating in all the school buildings using coal in Serbia were obtained. It is important to note that energy demands for each school were obtained by multiplying the quantity of coal with energy value of used type of coal and assortment in that school building in kWh/tonne. Unit energy values for all types of coal and their assortments used in the school buildings in the heating season 2010/2011, as well as their prices with transport (direct order, without mediator) are (1EUR=104,00 din.):

Kovin (lignite)	2792 kWh/t	46.2 EUR/tonne
Kolubara (lignite, raw)	2500 kWh/t	36.4 EUR/tonne
Kolubara (dried lignite)	4476 kWh/t	64.6 EUR/tonne
Kostolac (raw)	2730 kWh/t	37.9 EUR/tonne
Štavalj (compact )	4948 kWh/t	74.2 EUR/tonne
Resavica (compact)	5584 kWh/t	88.2 EUR/tonne
Banovići (compact)	5140 kWh/t	104 EUR/tonne
Kreka (compact)	3472 kWh/t	95.2 EUR/tonne
Pljevlja (compact)	2977 kWh/t	93.6 EUR/tonne

After that, the data were collected on energy value of wood chips with humidity of 35% and its market price in March 2012 with the aim of making calculations on quantities, effects, and economic parameters of substitution of coal with wood chips in all school buildings using coal in Serbia.

Conducted surveys of producers of wood chips showed that the wood chips with humidity which ranges in the interval from 30-40% is produced the most. Due to that reason, this report adopts the average value of 35%, and adopts wood types are beech, poplar and spruce/fir, considering their dominant share in the total quantities of wood chips produced in Serbia. It is also necessary to note that the prices of wood chips and its energy value vary for different types of wood. The price of wood chips also includes the prices of transport from the producers to the towns where certain school buildings are located. The principle of distance of certain school building from the seat of the closest producer of wood chips is taken as transport distance.

#### 4. Research results and discussion

Surveys conducted for purpose of this paper showed that in numerous school buildings in Serbia fossil fuels are used, primarily coal (table 1). Considering the obligations taken over by Serbia through ratification of Kyoto Protocol, primarily mitigation of CO<sub>2</sub> emission, these buildings of public significance represent favourable building for conversion of fossil fuels with other fuels. For heating purposes of school buildings in Serbia in the heating season 2010/2011 37,836 tonnes of coal was consumed as well as 25,067 m<sup>3</sup> of fuelwood. This quantity of coal includes different types of coal in terms of heat power, quantity of emission of CO<sub>2</sub> price, quantity of ash after burning and other characteristics.

Analysis of benefits achieved by use of wood fuels for heating of buildings of public significance included the segment of substitution of stated quantity of coal in schools which were the subject of survey in regard to decrease of CO<sub>2</sub>, as well as financial effects of such conversion. The table 2 provides the overview of effects of stated conversion of coal with selected wood fuels, noting that the following parameters were adopted for purposes of calculation:

- average energy value of coal: 3,700 kWh/tonne
- average emission of CO<sub>2</sub> for selected types of coal in Serbia: 0.29 kg/kWh
- total quantity of necessary energy for heating of stated school buildings obtained by burning of the stated coal quantity: 37,836 t × 3,700 kWh/tonne = 139,993,200 kWh
- average price of 1 kWh of coal energy: 0.026 €
- energy value of beech fuelwood with moisture of 30%: 2,629 kWh/m<sup>3</sup>
- energy value of wood briquettes (solid): 4,600 kWh/tonne
- energy value of wood pellets: 4,900 kWh/tonne
- price of 1 kWh of energy from fuelwood: 0.019 €
- price of 1 kWh of energy from briquettes: 0.025 €
- price of 1 kWh of energy from wood pellets: 0.029 €

Table 2. Ecological benefits and commercial effects of substitution of coal with fossil fuels in school buildings in Serbia for necessary quantity of energy in the amount of 1,399,932,000 kWh

Fuel type	Emission of CO <sub>2</sub> in kg/kWh	Total emission of CO <sub>2</sub> in tonnes for required energy amount	Price of energy in €/kWh	Total costs of energy products for required energy amount in €
Coal	0.29	40,598	0.026	3,639,823
Fuelwood	0.00976	1,366	0.019	2,659,871
Briquettes	0.02938	4,113	0.025	3,499,830
Pellets	0.0267	37,378	0.029	4,059,803

Sources: 1. Author's calculations



Table 1. Benchmark analysis of use of coal and wood chips for heating of 2,324 school buildings in Serbia

District name	Coal required for heating schools [tonnes]	Thermal energy required for heating schools [kWh]	Wood chips required for energy [tonnes]	Total procurement costs incl. transport to school [EUR]		Price of 1kWh of energy [EUR]	
				Coal	Wood chips	Coal	Wood chips
West Backa	648	1,641,126	549	36,455	20,313	0.022	0.012
South Backa	1,417	4,229,164	1,414	86,352	52,318	0.020	0.012
Nord Banat	965	2,367,140	791	42,550	33,775	0.018	0.014
Middle Banat	282	645,780	216	13,028	7,560	0.020	0.012
South Banat	650	1,623,320	543	28,287	19,005	0.017	0.012
Sremski district	102	524,280	175	10,608	6,475	0.020	0.012
Belgrade city	2,412	7,953,340	2,659	115,820	98,383	0.015	0.012
Mačvanski district	184	520,548	170	9,873	8,500	0.019	0.016
Kolubarski district	2,219	7,543,110	2,463	132,080	110,835	0.018	0.015
Podunavski district	2,075	7,287,815	2,380	99,517	95,200	0.014	0.013
Bраниčevski district	2,272	6,661,504	2,227	86,109	84,626	0.013	0.013
Šumadijski district	2,060	7,838,540	2,560	109,260	107,520	0.014	0.014
Pomoravski district	1,535	6,951,965	2,324	100,680	97,608	0.014	0.014
Borski district	513	2,995,246	978	45,291	42,054	0.015	0.014
Zaječarski district	1,801	7,468,933	2,439	106,184	104,877	0.014	0.014
Zlatiborski district	4,339	15,692,253	5,125	382,053	230,625	0.024	0.015
Moravički district	1,792	6,765,282	2,209	115,165	99,405	0.017	0.015
Raški district	2,285	8,517,690	2,782	141,190	125,190	0.017	0.015
Rasinski district	2,126	8,217,208	2,684	150,528	120,780	0.018	0.015
Nišavski district	1,926	8,463,282	2,764	133,259	124,380	0.016	0.015
Toplički district	257	956,338	312	22,667	14,040	0.024	0.015
Pirotski district	343	1,385,876	453	23,060	20,385	0.017	0.015
Jablanički district	842	3,553,090	1,160	61,852	52,200	0.017	0.015
Pčinjski district	790	3,306,385	1,080	56,456	48,600	0.017	0.015
TOTAL	33,837	123,109,215	40,458	2,108,324	1,724,654	0.017	0.014

Sources: 1. School building Directorates. 2. Wood chips producers. Prices of coal and wood chips incl. VAT and costs of transport to school buildings

Benchmark analysis of conversion of coal with wood chips shows the total justification from economic aspect due to lower total costs, as well as costs of 1 kWh of energy, even those regions in which the prices of 1 kWh of energy from coal and wood chips are equal. This is due to the fact that on the price of 1 kWh of energy from coal the costs of removing the ash generated by burning coal needs to be added, which is not the case with wood chips. In other regions, the price of 1 kWh of wood chips is lower than the price of 1 kWh of energy from coal and ranges from 6.25% (Nišavski district) to 37.5% (Toplički district).

Total needed quantities of wood chips for conversion of coal in school buildings in Serbia are 40,458 tonnes. Considering that the production of wood chips in Serbia in 2010 was 39,000 tonnes (Glavonjić B. 2011), the conclusion is that there is a significant space for the development of wood chips market in Serbia. If wood was used instead of coal for the necessary energy quantity, the quantity of emitted CO<sub>2</sub> would be 29.7 times lower. Similar ecological effects are obtained also when wood briquettes and pellets are used instead of coal.

In terms of financial effects calculated only based on market prices for procurement of fuel, fuelwood and wood briquettes are price-competitive to coal, while the use of wood pellets for the stated energy quantity would be slightly more expensive. However, if we take into consideration comfort provided by wood pellets in course of use, as well as costs of manipulation and removing of ash generated in course of burning of this quantity of coal, we can conclude that wood pellets too are more price-competitive to coal.

Stated example and results of analysis given in the table 2 clearly indicate all ecological and financial benefits of wood fuels compared to coal. Considering the fact that there are several thousand health buildings in Serbia (hospitals, health care centers and nursing homes), kindergartens, restaurants and other public and commercial buildings using coal or other fossil fuels, the possibility of conversion with wood fuels are really high. In the concrete example of schools, conversion of coal in the quantity of 37,836 tonnes would require the quantity of 53,249 m<sup>3</sup> of fuelwood. Considering that a number of schools in Serbia uses gas, its conversion with wood fuels would enable significant decrease of import of natural gas, and at the same time decrease of external trade deficit of Serbia in regards to energy products.

## **5. Conclusion**

Through surveying of actual state in the field of consumption of energy, as well as type of fuel used for purposes of heating school buildings, the conclusion was made that there are areas in which it is possible to execute conversion of fossil fuels with wood fuels. The actual situation in practice in the heating season 2011/2012 showed that the process of use of wood fuels in households, public institutions, and commercial buildings in Serbia is conducted in a spontaneous and unorganized manner without any adequate plans and prepared activities.

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# INTERNATIONAL TRADE IN WOOD SAWN FROM REPUBLIC OF MACEDONIA

*Zivka Meloska – Ilijana Petrovska*

## **Abstract:**

In Republic of Macedonia wood sawn is mainly produced from non-coniferous, and only one quarter from the total production is from coniferous. This situation also influence on the wood sawn foreign trade of this country. Usually Macedonia is importing wood sawn from coniferous and exporting wood sawn from non- coniferous. In this paper we are analyzing the foreign trade, supported with the regional focus, defined strategic partner countries according to the Standard International Trade Classification, rev 3.

## **Key words:**

wood sawn, non-coniferous, coniferous, foreign trade, regional strategy

## **Introduction**

The international trade, and the export and the import of products are of a main importance of each country, especially to developing countries.

One of the main strategic Macedonian orientations is the export increment and international trade improvement. However, the export and import of wood sawn from Republic of Macedonia, has not appropriate placement in the international trade of Republic of Macedonia, neither by amount, neither by value.

The wood sawn is not among the most exported products from Republic of Macedonia, but is a product with a highest value among the exported products from wood industry. From the other side, the enormous increase of companies in the wood industry in the last years, brought increase in wood sawn import.

## **Research aim and objectives**

The aim of this research is to analyze the trade with wood sawn of Republic of Macedonia. Analyzed are the total export and import, the participation of each type and their dynamics, the exporting trade balance and at the end accentuated are the strategic partners in export and import of wood sawn.

The research is done over the secondary data from the State Statistical office of Republic of Macedonia according the SMTK, revision 3, taking into consideration the value of export and import of wood sawn in US dollars.

The objectives of this research are:

- To analyze the foreign exchange and define trends for wood sawn trade and its balance.
- To define the strategic partners in wood sawn trade and
- To define the place and the role of Republic of Macedonia in the trade exchange with wood sawn, and also the opportunities and possible ways for their increase.

## Wood Sawn Export – import

The export and import of wood sawn in Republic of Macedonia is analyzed for the period from 2005 – 2010. The data are presented in Table 1, in separate columns for coniferous wood sawn, non- coniferous wood sawn and the total amount in US dollars. It is obvious the small participation of coniferous wood sawn, in average 3 percentage and the small participation of non- coniferous wood sawn with 9 percentage.

Table 1. Export and import of wood sawn (- in 000 US dollars)

1	Wood sawn non coniferous			Wood sawn from coniferous			Total wood sawn		
	Export	Import	Balance	Export	Import	Balance	Export	Import	Balance
2	3	4		2	3	4	2	3	4
2005	3116	958	2158		10865	-10865	3116	11823	-8707
2006	2457	483	1974	/	10327	-10327	2457	10810	-8353
2007	4811	960	3851	273	9693	-9420	5084	10653	-5569
2008	4233	1184	3049	173	11794	-11621	4408	12978	-8572
2009	3059	1555	1504	/	12738	-12738	3059	14293	-11234
2010	1964	1176	788	158	9022	-8864	2122	10189	-8067
Average	3273	1053		101	10740		3374	11793	
(AAP)	-8,82	4,18			-3,65		-7,4	-2,93	

Source: The State Statistical Office of Republic of Macedonia

The coniferous wood sawn export in the analyzed period was not constant, and it varied in different years. It presents downsizing tendency from 2007 and further. The export of non-coniferous wood sawn is decreased with 8,82 percentage. We could conclude that Republic of Macedonia mainly exports non-coniferous wood sawn in the analyzed period. The non-coniferous wood sawn is 97% from the total export of wood sawn, and only 3% is the coniferous wood sawn.

In the analyzed period (2005 – 2010), the import of wood sawn has an opposite trend from the export. Mainly imported is the coniferous wood sawn, and participates with an average 91% in the total import of wood sawn, and the non-coniferous wood sawn participates with only 9%. The import of wood sawn was variable in each year, with decreasing tendency with AAP from - 3,65%. Both the export and the import of wood sawn, have a negative trend in the analyzed period. The export decreases with 7,4%, and the import decreases with 2,93%.

In the analyzed period the balance of non-coniferous wood sawn is positive for all analyzed years. Contrary, the coniferous wood sawn as presented in the table 1, has an opposite trend from the non-coniferous wood sawn. Hence, the balance here is negative for all analyzed years, taking into consideration also the fact that in three years there was no trade at all of coniferous wood sawn.

The total balance in the international trade with wood sawn in Republic of Macedonia is negative. According to the results obvious is that the negative balance is increased in the last years, besides the fact that the non-coniferous wood sawn has a positive trade balance. However,

this does not influence on the total trade balance, as the non- coniferous wood sawn participates with a smaller percentage in the total trade with wood sawn.

### **Regional orientation of the international trade with wood sawn**

In this section analyzed will be the regional orientation for different wood sawn export or import trade activities, especially for exporting non-coniferous wood sawn, and importing coniferous wood sawn.

Table 2. Export of non- coniferous wood sawn (- in % from the total value)

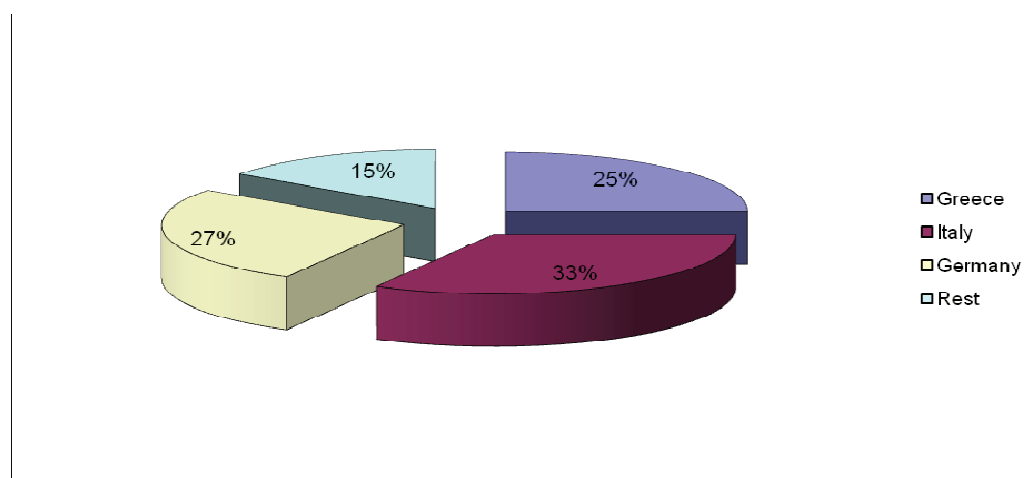
Country	2005	2006	2007	2008	2009	2010
Greece	31	30	21	32	26	25
Slovenia	21	20	/	/	/	/
Italy	17	30	27	20	24	33
Germany	/	/	21	26	30	27
Rest	31	20	31	22	20	15
Total	100	100	100	100	100	100

Source: The State Statistical Office of Republic of Macedonia

According to the data from the table 2, we could conclude that three countries have the biggest role in export of non-coniferous wood sawn from Republic of Macedonia: Greece, Italy and Germany. In 2005 and 2006 Slovenia was also an exporting destination, but from 2007 until 2010 Germany is taking the place of Slovenia as an exporting destination. Germany is participating with 25% from the export of non- coniferous wood sawn. According the data from the table 2, we could conclude that all three countries Greece, Italy and Germany in the period from 2007 to 2010 were active with average same percentage in the export of non- coniferous wood sawn. Their total participation was 80% from the total export, and only 20% was done to all other countries. In the 2010 the biggest export was done to Italy 33%, then to Greece with 25%, to Germany 27% and to rest of the countries with 15%, as presented in the figure 1.



Figure 1. Export structure of non- coniferous wood sawn



According to the previous analyzes for the import of the wood sawn, we concluded that the biggest percentage 91% is made from coniferous wood sawn, and only 9% from non- coniferous wood sawn. Therefore, we are going to analyze just the regional orientation of the import of coniferous wood sawn. In table 3 presented are data for participation of each country in the total import of coniferous wood sawn.

Table 3. Import of coniferous wood sawn (-in % from the total value)

Country	2005	2006	2007	2008	2009	2010
Bulgaria	60	45	32	21	49	59
Bosnia and Herzegovina	15	28	44	35	13	18
Slovenia	/	13	17	16	/	/
Romania	12	/	/	/	/	/
Austria	/	/	/	/	18	9
Rest	15	14	7	28	20	14
Total	100	100	100	100	100	100

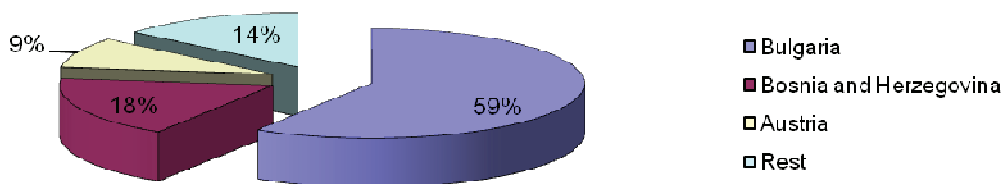
Source: The State Statistical Office of Republic of Macedonia

From the presented data in table 3, it is obvious that import of coniferous wood sawn is mainly done from few countries. In 2006, 2007 and 2008 main countries for import of coniferous wood sawn were Bulgaria, Bosnia and Herzegovina and Slovenia. It is specific that from Bulgaria in 2005 imported is 60% from the total value of coniferous wood sawn. That amount of import is decreased in the following years and in 2008 Bulgaria imports only 21%. In the last two years it increases again and in 2010 is 59%.

We could conclude that main countries for import of coniferous wood sawn in 2010 are Bulgaria with 59%, Bosnia and Herzegovina with 18% and Austria with 9% in the total import of

coniferous wood sawn as presented in the figure 2. These three countries participate with 86% from the total import of coniferous wood sawn and all the other countries with 14%.

Figure 2. Import structure of coniferous wood sawn



## Conclusions

According to the performed analyzes on the international trade with wood sawn for the period 2005 – 2010, we could conclude the following:

1. Mainly from Republic of Macedonia exported is non- coniferous wood sawn, and imported is coniferous wood sawn
2. The value of performed import and export as total, and per each of the two types (coniferous and non- coniferous) has a negative trend
3. In the international trade the total wood sawn and coniferous wood sawn have a negative balance. Only the non- coniferous wood sawn has a positive balance, but as it participates with very small percentage in the international trade, it does not influence on the total values
4. Strategic partners for export of wood sawn are Greece, Italy and Germany, and for import most dominant are Bulgaria, Bosnia and Herzegovina and Austria.

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# EFFECTIVE PLANNING OF MARKETING COMMUNICATIONS ACTIVITIES IN THE WOODWORKING INDUSTRY

*Renata Nováková – Andrea Tománková*

## **Abstract:**

The planning process is the first step in any systematic action to be effective. Marketing and communication activities in the woodworking industry are currently undergoing changes that accentuate the effects of the economic environment as well as new trends in the field. The subject of this paper will be monitoring and evaluation of marketing communications activities in terms of their effectiveness.

## **Key words:**

efficiency, planning, marketing communication, woodworking industry

## **Introduction**

*Motto: “Non-planning means to plan one’s own defeat.” (Kotler)*

In spite of the fact that woodworking industry in the last year reported a significant increase in revenues (mainly sales of Lesy SR /Forests of the Slovak Republic/ for the sale of timber, where a 10-fold increase in sales was reported in 2011 compared to last year), most organizations working in this area do not have such positive economic results. It is true that the bigger players in the paper and cellulose industry experienced, thanks to increased exports, also an increase by 7.1%. In general, however, the preponderance of small and medium-sized companies operating in the sector is struggling with the crisis. The results are budget cuts and a very significant cost reductions we have seen just in the marketing activities. In our paper we want to highlight the importance of marketing planning and effective evaluation of planned activities in this respect, which can bring positive benefits rather than just unproductive expenses for a company. But it is necessary to plan all activities related to marketing very carefully and do not forget about feedback, which is a part of control mechanisms checking whether the planned objectives and targets are met effectively in such a manner that they would bring desired effects to the company. Our paper has been divided into three main parts. In the first part we will cover basic information that generate the essence of planning process closely connected with the management. In the second part we try to bring the possibilities and ways of evaluating the effectiveness of planned marketing activities using tools and methods which are well or less known from professional literature, but also in practice. In the third part we will give a concrete example of marketing planning in terms of small and medium enterprises in Slovakia.

## **1 Planning – a basic management function in small and medium-sized organizations operating in the woodworking industry**

Planning is one of the most important management functions. It is deciding on the future of the organization, i.e. deciding what, how, to whom, in what way, with what means and for how much we will produce. The success of planning lies in knowledge of the so-called **administrative marketing** which means correct understanding, developing and implementing marketing plans. Organizations typically develop the following types of plans:

- a) Strategic plans - this planning document reflects the possibilities and opportunities for organizations to adapt in a changing marketing environment. It creates a balance between the objectives and capabilities of the organization.
- b) Long-term plan - describes the factors that will influence the organization in the following years.
- c) Annual plan - reflects the current situation in the organization and focuses on the objectives of the annual implementation perspective. Integral part of this plan are control mechanisms mapping feedback in relation to the effectiveness of planned activities.
- d) Action plan - addresses immediate objectives and targets. It is usually made for a very short time and must give answers to questions like: What?, Where?, Who?, How? Until what time? For what costs?

The planning process goes through three phases:

1. The analytical phase consists of collecting, processing, evaluation and the subsequent use of information
2. The conceptual phase is a step in the development of a comprehensive plan for the specified time period
3. Implementation and control phases – in these phases it is necessary by mutual interaction to monitor compliance with and implementation of the plan and identify the changes that influenced the plan either positively or negatively.

"The purpose of marketing planning is to find consistency between market opportunities and business resources."<sup>1</sup>

Marketing plan is included to functional sub-plans of the organization and when setting it, we must take into account any other sub-plans, e.g. plan of research and development, production plan, financial plan, personal plan, etc.

Marketing plans are usually developed for 3-5 years. Plans relating to the use of tools and procedures for implementation of marketing plans are made for the time horizon of 1-2 years. Experts in marketing planning recommend a marketing action plan for each major marketing activity. Then the following action plans should exist:

- Plans for each brand that is a part of the portfolio of organization
- Plans for product lines and for different product categories
- Plans for individual products in various market segments
- Plans for the geographical distribution of markets
- Marketing plans focusing on major customers ...

We could continue in various types of breakdowns and previews for marketing planning. Generally, however, we must say that marketing planning is getting big importance in the woodworking industry. Organizations operating in this sector must face a relatively large competitive pressure from neighbouring countries such as Poland, the Czech Republic and therefore the quality and effectiveness of marketing planning activities leading to prosperity for the company can be a vital step. As mentioned above, at the time of crisis, organizations, and not only in the woodworking and furniture industry, tend to reduce the subsidy funds for the communication mix tools. The paradox is that this mistake may cause to spend a lot of money by the organization. More advantageous option is to plan an effective combination of different tools and techniques of marketing communication so as to give rise

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<sup>1</sup> Lesáková, D. et al.: Strategic marketing. Bratislava. The University of Economics, 1994, p. 189

to an integrated marketing communication, the main advantage of which may even be lower costs.

"The marketing plan is a written document containing the basic goals, objectives of the organization, procedures and tools to achieve them in a certain time frame. It is a guide to the location of individual marketing activities."<sup>2</sup>

The content of the plans should be brief and concise. There must be clearly stated objectives to be achieved by the organization and resources to be applied. The range of plans differ in size and focus of the organization. An important fact is there are not two identical organizations, so it is not possible to create two identical marketing plans. There is always an appeal to adapt to specific features of the organization.

In general, a marketing plan should contain the following parts:

1. Definitions
2. Analysis focused on internal and external environment
3. A part focused on the specification of marketing objectives in relation to key strategic objectives of the organization
4. Timetable for completion of tasks leading to meeting the objectives
5. Designation of responsibilities for implementing the activities
6. Budget
7. Control mechanisms based on tools and methods of economic and non-economic focus, based on an evaluation of the effectiveness of planned activities.

Very difficult area is the use of such control mechanisms, which are really very meaningful and can objectively evaluate whether the scheduled tasks actually contribute to further growth of the organization. It requires experts who know not only the efficacy of the communication mix tools, but also control methods and evaluation techniques.

## **2 Evaluation of the effectiveness of marketing communication**

Efficiency can be defined as the relative quantity expressing the ratio of output and input, while the following relationship must be true:

Output / Input  $\geq 1$

The basis for efficient marketing communication is to identify measurable goals or purpose for which the marketing communication in the woodworking industry is planned. In evaluating the effectiveness of communication with the external environment the following must be taken into account:

a) *Type of the market* - the use of communication tools varies depending on the customer and the type of business (building awareness, understanding, effective reminders, repeated persuasion, etc.).

b) *Using push strategy versus pull strategy* – Push strategy is based on the marketing activities of a manufacturer (especially the activities of sales force and sales support). Pull strategy includes marketing activities aimed at end users (advertising and promotion).

c) *The stages of readiness of the customer to buy:*

- Stage of acquisition of trust (promotion and publicity)

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<sup>2</sup> Cibáková, V., Bartáková, G.: Principles of marketing. Bratislava. Iura edition, 2007, p. 59



- Stage of tolerance to the customer's product (advertising and personal selling)
- Stage of acceptance of rational reasons (personal sale)
- The actual order of goods (personal selling and sales promotion)
- Re-ordering of goods (personal selling, sales promotion and advertising in smaller extent).

d) *The stages of product life cycle* - the effectiveness of communication tools will also vary depending on the product life cycle stages:

- Stage of introducing the product on the market: highly effective tools are advertising and publicity, personal selling and sales promotion
- Stage of growth – all tools of communication mix may be attenuated since the demand is supported by oral promotion
- Stage of maturity – the most important are sales promotion, advertising and personal selling
- Stage of decline – sales promotion tends to get stronger and vice versa advertising and publicity reduce their effectiveness.

e) *Placing products of the organization on the market* - experience has shown that branded products of companies with better positioning in the market gain more benefit from advertising than from the sales promotion.

After the development of marketing communication plan it is necessary to focus its effect on end beneficiaries. The task is to ask whether they know the message, whether they recall it, how many times they saw it or registered, how they think about it or how they perceive it. It is important to identify the previous and current attitudes of the end beneficiaries to the product and the company and do statistics or analysis of how many people bought a particular product, how many people liked it, how many people spoke about it to the others, etc.

### 3 Research on the effectiveness of communication in advertising

Advertising is a very effective tool of communication and as such it is also of great importance in the business environment for small and medium-sized organizations operating in the woodworking industry. It uses several techniques or methods by which it seeks to attract the attention of the target group. In this case, the target group includes customers who have interest in products of woodworking and furniture industry. Advertising methods and techniques can have various forms – from the use of conventional ones focused on standard mass media up to the various new, unusual and trendy ways of reaching customers such as networking, guerilla marketing, buzz marketing, etc.

Research on the effectiveness of communication is aimed to determine whether the advertising or ad communicates effectively. This is called *testing ideas* and it takes place before the advertisement is presented to mass media or after it is implemented. There are three main methods of advertising pre-testing of advertising:

a) *Method of direct evaluation* - consumers are required to evaluate various alternatives of advertising. These evaluations are used to assess what kind of advertising gets attention, what is its cognitive value or emotional impact motivating them to act. However, it must be said that this method of measurement is not very perfect. Measurement of high values suggests a potentially more effective advertising.

b) **Portfolio test** - consumers are required to see or listen to a certain portfolio of ads. They have enough time for it. They are then asked to remember all the ads and their content without any assistance. The level of what they remembered reflects the ability of advertising to penetrate the consciousness and reach that their information is well understood and memorized.

c) **Laboratory test** – laboratory instruments are used to measure physiological responses of consumers to advertising (heart rate, blood pressure, pupil expansion and secretion of sweat). Although these tests measure the ability of advertising to get consumers' attention, they say nothing about the effect on opinions, attitudes, or intentions.

We must therefore say that the research of communication effectiveness through the above mentioned methods does not say much about the impact of the sale and profitability of the organization operating in woodworking and furniture industry. They rather serve as support methods that fill an important part of the whole set of methods.

Organisations offering products in woodworking and furniture industry are interested in finding out whether they do not invest to the communication with their clients too little or too much. In this case it is necessary to focus on quantifying of the economic indicators. Most of these indicators are evaluated in terms of their dynamics. We can generate e.g. the following:

- The share of expenditure on marketing communication tools for a certain period of time
- The financial share on prime time of advertising or other instrument at a certain time period
- Market share
- The share of expenditures for marketing activities on the profit
- Increase in sales following the increase in investment costs for the advertising campaign, etc.

In this way we could even generate the whole range of economic and non-economic indicators. They form an integral part of the so-called control phase in marketing planning.

## **Conclusion**

The key to the success of small or large company on the market in growing competition is continuous improvement and innovation of marketing communication activities what is done also by the company Nábytok R studio. From this example, the opportunities are obvious that lead to planning and subsequent integration of the tools of communication mix so that they are sufficiently effective for the organization. This example from the practice is not yet completely redesigned into detail, as it would require a marketing plan. But it is sufficient for illustration of this issue as it gives insight into the timeliness of investment in marketing activities and highlights the importance of ensuring and strengthening the marketing communication mix tools. Only the company that is well-known can be successful in searching for new potential customers and maintaining the stable ones. Only the company that is presented to the public can draw attention in a competitive environment to their products. Only the company that can effectively capitalize their costs to promotional activities can succeed in the market and sell their products on favourable terms.

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# IMPROVING THE QUALITY OF EDUCATIONAL INSTITUTIONS FOCUSED ON WOODWORKING INDUSTRY

*Dana Petranová*

## **Abstract:**

The author emphasizes the contribution of higher education which should adapt to the needs of knowledge society. The Faculty of Mass Media Communications with a view to implement this project seeks to promote the quality of education in order to adapt to current and future needs of the knowledge society. Post information on the specific objectives of the project: introduction of a direct measurement of the quality of curriculum, the introduction to implemented measures improving the quality of education in the teaching process, removing the information inequality in relation to public universities concerning higher education in the curriculum, creating a cyclical management of the evaluation of use of external evaluation instruments.

## **Key words:**

quality, knowledge society, innovative models, assessment, monitoring

The Faculty of Mass Media Communication, University of Ss. Cyril and Methodius in Trnava is a university institution the aim of which is to prepare university educated professionals also in the area of mass media and marketing communication. When reaching the aims, tasks and goals of an educational institution it is necessary that the university management creates a significant consensual climate. That means being informed about the interests, plans and activities of all research and pedagogical staff as well as professional staff and include them into the needs of the university in order to achieve better results, penetration and overall assessment by various evaluation agencies in the interest of objectivity and reality conditions. In the promising university development it is required to merge professional orientation of faculties with the demands of social practice in the Slovak Republic and in teaching process combine pedagogical approach with scientific, develop interdisciplinary relations and connection to practice. This means application of the same didactic and professional approach of teachers, work of which will be a motivational contribution for students' independent study. Strong emphasis is in the framework of university education quality improvement put on improving individual study programmes and their direct connection to the needs of practice. For improvements in the quality of education it is necessary to introduce systems for direct measurement of the quality of education.

Prerequisite for permanent quality improvements of educational activity of all university teachers must be a regular evaluation on the basis of students' survey results and self-evaluating procedures enabling in this way students to comment on the quality of teaching process, content questions, difficulty of study during term and difficulty of exams in individual subjects. This kind of feedback provokes pressure on improving the quality and supports the brilliance of processes at university and its faculties and at the same time serves as feedback for faculties. As a significant tool for improving the quality of education we can identify the system of direct measurement of the quality of education in individual study programmes. This is one of the priorities in the forthcoming period of university development.

We realize the need to support the quality improvements of education with the aim to adapt to current and perspective needs of knowledge society. It is necessary for each university to:

- introduce the system of direct quality measurement of a study programme,
- introduce the system of implementing measures aimed at improvements of quality of education in particular study programmes,
- remove information inequality in relations between university and the public regarding university education in study programmes,
- create cyclically controlled assessment system using external evaluation tools.

The Faculty of Mass Media Communication UCM in Trnava has decided to create and implement a complex system of direct quality measurement of university education in study programme marketing communication, output of which will be improvement of education quality. On the basis of requirements rooted in the objectives of the university it is necessary to create a system that will ensure the assessment system on internal and external levels. The model of evaluation system should be built on the requirements resulting from the strategic document: Normy a smernice na zabezpečovanie kvality v Európskom priestore vysokoškolského vzdelávania.<sup>1</sup> (The Standards and Guidelines for Quality Assurance in the European Higher Education Area) In the following part we list a short abstract of those which I intend to adapt within the conditions of our educational institution:

Universities should feature politics and related procedures for ensuring the quality and standard of their study programmes and conferring the academic degrees. They should also be explicitly committed to development of culture which recognizes the importance of quality and ensuring the quality in their work. To achieve this goal the universities should develop and implement strategies for permanent quality improvement. Strategy, politics and procedures should have a formal status and should be publicly accessible. They should include also the participation of students and other parts interested. They should have formal mechanism for approvals, regular revisions and control of their study programmes and conferring the academic degrees. We want our students to be assessed according to published criteria, regulations and procedures which are thoroughly applied. Universities should have implemented system with help of which they can reason whether the professionals teaching their students are sufficiently qualified and competent for such an activity. They should be at disposal to people performing external control and commented on in published reports. Universities should ensure that the available sources for support of students' education are adequate and suitable for each study programme offered. They should ensure collecting, analysis and use of particular information for effective management of their study programmes and other activities. They should also regularly publish current, unbiased and objective information – both quantitatively and qualitatively, on study programmes and academic degrees which they offer.

Higher education requires the fulfilment of requirements stated within *The Standards and Guidelines for Quality Assurance in the European Higher Education Area*. In external procedures for quality assurance the efficiency of internal processes for quality assurance should be taken into consideration. The goals and aims of processes for quality assurance

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<sup>1</sup> Normy a smernice na zabezpečovanie kvality v Európskom priestore vysokoškolského vzdelávania, spracovaného ENQA v spolupráci s EUA, ESIB a EURASHE Dostupné na internete: [http://www.zakdu.edu.ua/Storage/nriartemov\\_20120514\\_geopolitika\\_6.pdf](http://www.zakdu.edu.ua/Storage/nriartemov_20120514_geopolitika_6.pdf)

should be set by any people interested (universities including) before setting the processes themselves and they should be published with the description of procedures necessary to be applied.

Any formal decision accepted on the basis of external quality assurance should rest upon explicitly published criteria which are thoroughly applied. All the processes for external quality assurance should be proposed especially with the focus on the appropriateness for achieving goals and aims which were set for them. Information (news) should be published and written in style which is clear and easily accessible to intended readers. Any decisions, recommendations and instructions included in the news should be for the reader easily identifiable. Processes for quality assurances, which include recommendation for measures approvals or which require a follow-up action plan, should have the subsequent procedure set in advance. This is then to be thoroughly implemented. External quality assurance of universities and/or study programmes should be performed on cyclical basis. The length of a cycle and assessment practices used should be clearly defined and published in advance. Besides this, the agencies for quality assurance should according to the need publish reports describing and analyzing the general findings of the control, evaluation, assessment, etc.

Ideal condition for our point of view is to apply the norms stated within the framework of implementing the assessment system and direct measurement of the quality of education in the study programme marketing communication and subsequently carry out pilot test of this system with the proposals and implementation measures for improvements of quality in the study programme and removal of information inequality in relations to the public. We aim to implement the created system in a cyclical way and extend it for other study programmes at the university.

When creating this complex system we build upon some dominant principles:

- the higher education providers have the primary responsibility for the quality and provision of the education they provide,
- it is necessary to procure the interest of the society in quality and standards of higher education,
- it is necessary to develop the quality of academic programmes and improve for students and other recipients of higher education,
- it is necessary to implement effective organizational structures for provision and support of academic programmes,
- transparency and use of external professional knowledge in the area of assuring the quality of processes is important,
- processes through which the universities could demonstrate their responsibility, including the responsibility for investments of public and private means should be developed,
- quality assurance from the viewpoint of responsibility is fully compatible with the system of quality management for the purposes of improvement.

Creating system of approval, monitoring and periodical assessment of study programmes leads to providing the quality of study programmes which rest upon assumptions such as:

- explicit formulation of expected teaching outcomes,
- focus on structure, composition and content of study programmes,



- emphasis upon specific needs of different forms of education and types of study programmes,
- availability of necessary study sources,
- existence of formal procedures for approval of study programmes (externally)
- monitoring the progress of students and their study results,
- regular periodical evaluation of study programmes (including the external members in evaluating team),
- regularly acquired feedback from employers and other relevant organizations active on the labour market,
- participation of students in the processes of quality assurance.

Creation of the system must be implemented in particular study programme of the university taking into consideration its specifics. The goal is to create a system representing set of processes on different levels of structure at university implementation of which produces conditions for successful professional work of university graduates in social practice. The system apart from this has to create space for implementation of specifics of individual faculties and study programmes and is created by the bottom up system.

The Faculty of Mass Media Communication is ready to implement its plans in the area of quality assurance in all aspects: personal, institutional, legal, technological, ecological and financial ones. In the end there should be influence exercised upon direct and indirect contact groups with our educational institution. The target group of students studying the study programme marketing communication will be among the direct users of the outcomes. The outcome will be the creation of system for direct quality measurement, which we believe will result into improvements of the quality of higher education in study programmes, particularly in the study programme marketing communication. The indirect users of the project outcome are represented by potential employers who by employing the graduates win a qualified manpower. This will contribute to improvements in economic situation and building corporate reputation. We are convinced that this is the way how to improve our competitiveness among Slovak universities and combine the professional orientation of the faculties with the requirements of social practice in the Slovak Republic. Similarly in this way we should combine pedagogical approach with the scientific one in the teaching process, develop interdisciplinary relations and link theory with practice.

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# CORPORATE GOVERNANCE IN FORESTRY

*Stjepan Posavec – Karlo Beljan – Mario Šporčić – Matija Landekić*

## **Abstract:**

Corporate governance is a key element in improving economic efficiency and growth, and in increasing investors' confidence. It provides a structure through which company objectives are set, the means for achieving the goals and methods of monitoring results. Corporate governance provides a framework for managing and monitoring companies. Subsequently, it can be said that corporate governance is one of the key elements in improving economic efficiency and market economy. The European model of corporate governance finds its application in the EU and all other countries which harmonize their legislation with EU directives regulating corporate governance and with the OECD recommendations relating to corporate governance. The issue of corporate governance in Croatia is imposed simultaneously with the privatization and institution building of market economy. As a result of privatization, there is a large number of small shareholders. Croatian Forests Ltd established a European (two stage) model of management and control functions on the principles of two-tier corporate governance structure where the functions of management and leadership are strictly separated and contained in the management and supervisory board. Earlier analysis of the management structure of the company Croatian Forests Ltd indicated the need for changes in certain segments of the action. This paper presents a study of corporate culture in the company Croatian Forests Ltd, and proposes changes in its organization.

## **Key words:**

forest economics, corporate governance, organization, Croatian Forests Ltd.

## **1. Introduction and problem matter**

Corporate governance affects legal, regulatory and institutional environment. Basic rules of corporate governance are defined by appropriate legislation, primarily of the Law of Trade Company<sup>1</sup> and Constitutional Court Decision<sup>2</sup> and other regulations governing capital markets, accounting and auditing issues. However, beside consistent application of regulations, international practice has shown the need for development of good corporate governance practices through adoption and implementation of codes of corporate governance. Considering these facts and the importance of responsible and ethical behavior of businesses subjects within the economy, and as recommended by the Organization for Economic Cooperation and Development (OECD)<sup>3</sup>, Croatian Agency for Supervision of Financial Services (HANFA)<sup>4</sup> and Zagreb Stock Exchange, developed the Code of Corporate Governance in 2007. The Code aims to establish high standards of corporate governance and

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<sup>1</sup> Official Gazette No. 111/93, 34/99, 121/99

<sup>2</sup> Official Gazette No. 118/03, 107 / 07, 146/08, 137/09

<sup>3</sup> OECD-(Organisation for Economic Co-operation and Development): Principles of Corporate Governance. Paris: OECD, 2004. 65pp. ISBN 978-92-64-05597-1

<sup>4</sup> HANFA-(Hrvatska agencija za nadzor financijskih usluga): Kodeks korporativnog upravljanja. Zagreb: Hanfa, 2007

transparency of business activities. Also, Croatian Government in 2010 made the Decision on the adoption of Code of Corporate Governance<sup>5</sup>. The Code aimed to upgrade corporate relations arising from existing legislation and internationally accepted principles and experiences on the best corporate governance practices. Objectives of the Code are to establish, maintain and further improve high standards of corporate governance and transparency responsible for the effective management of capital and jobs. Fundamental principles of the Code are legality, transparency, clearly defined procedures for supervisory board, management and other bodies and structures that make important decisions, prevent conflicts of interest, effective internal controls, strengthening personal responsibility and corporate social responsibility<sup>6</sup>.

OECD promotes the policy aimed at achieving sustainable economic growth and employment, and increasing living standards in member countries, ensuring financial stability and thus contributes to the development of world economy on a multilateral basis in accordance with international obligations<sup>7</sup>. OECD guidelines for corporate governance represent the criteria for policy makers, investors, corporations and other interested parties. It promotes a program of corporate governance and provides specific guidance for legislative and regulatory initiatives. The guidelines are an instrument that provides standards, guidelines and best practices for corporate governance. It is adaptable to specific legal, economic and cultural circumstances. Policy makers can use them while creating legal and regulatory framework for corporate governance that respects their own economic, social, legal and cultural circumstances. Good corporate governance is a significant factor in attracting investment as well as in investor protection<sup>8</sup>.

Corporate governance in a country has certain specific features or elements that set it apart from other countries, while some common principles can be detected<sup>9,10</sup>. This method of management is determined by ownership structure and has some general characteristics, such as excessive state ownership, the instability of its structure, small influence of workers' participation<sup>11</sup>. The differences such as historical heritage, legal and institutional framework, structure and functioning of financial markets influence the formation of different models of corporate governance, which determine the model of corporate governance. Two most popular models of corporate governance are:

- Anglo-Saxon (open, single-level) model
- European (closed, two-level, continental) model

Although they are both useful and in many ways similar, the models differ significantly in the organizational structure, management authority and decision-making procedures.

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<sup>5</sup> Official Gazette No. 112/10

<sup>6</sup> Tipurić, D.: Nadzorni odbor i korporativno upravljanje. Zagreb: Sinergija, 2006. 365pp. ISBN: 953-6895-30-7

<sup>7</sup> Račić, D., Cvijanović, V., Aralica, Z.: The Effects of the Corporate Governance System on Innovation Activities in Croatia. Vol.9 No.1-2. Zagreb: Revija za sociologiju, 2008. 101-114pp.

<sup>8</sup> Veršić Marušić, M.: Zašto kodeks korporacijskog upravljanja?. Zagreb: Hrvatska pravna revija, 2004. 31-39pp.

<sup>9</sup> Barbić, J., Čolaković, E., Parać, B., Vujić, V.: Korporativno upravljanje - osnove dobre prakse vođenja društva kapitala. Zagreb: Biblioteka Kaleidoskop, 2008. 608pp, ISBN: 978-953-98558-5-5

<sup>10</sup> Tipurić, D.: Korporativno upravljanje. Zagreb: Sinergija, 2008. 420pp. ISBN 978-953-6895-36-6

<sup>11</sup> Čengić, D.: Problemi korporacijskog upravljanja u postprivatizacijskom razdoblju. Zagreb: Društvena istraživanja Zagreb, godina 7 broj. 6 (38), 1998. 767-792pp. ISBN 953-97410-1-7

## **2. Materials and methods**

The issue of corporate governance in Croatia is imposed simultaneously with the privatization and institution building of market economy. As a result of privatization, there is a large number of small shareholders - both at the beginning of the 1990's, and in the coupon privatization in 1997. However, slow development of capital markets and a relatively bad position of small shareholders have had an impact on the shares neutralization and/or quick sales. Privatization has created conditions for restructuring of companies and consolidation of equity shares. Still, its course was marked by slowness and by significant inconsistencies and arbitrary decisions. Establishment of legal and institutional framework for corporate governance was also slow and insufficiently effective<sup>12</sup>. The results of these conditions were frequent unregulated takeovers (usually through loans) and the dominance of concentrated ownership structures that were partly supervised by management and employees, and partly by the bigger shareholders. All of the above slowed the establishment and expansion of good practices of corporate governance, which was additionally influenced by the lack of knowledge, and only partial recognition of the importance of corporate governance by the business community and experts. This had a negative impact on corporate transparency and protection of shareholder rights and consequently on the interest of investors and capital market development. Since domestic companies mainly depend on bank loans for the long-term financing and very rarely on issuing of shares or bonds, capital market could not have had impact on their corporate governance. Privatized companies had kept concentrated ownership structure and were therefore in many cases beyond the reach of the capital market.

### **2.1. Research object**

Dissemination of good practices of corporate governance implies recognition of the importance and usefulness of corporate governance by the business community. Law on commercial companies, regulations on capital market governing, law on accounting and auditing and other relevant laws include rules relevant for corporate governance. Croatian forests Ltd was established on January 1st 1991, as a public company for management of forests and forest lands in the Republic of Croatia, in Zagreb, 2002. Based on Law on Amendments to the Law on Forests<sup>13</sup> and Decision of the Government from March 7<sup>th</sup> 2002, the former public company was transformed into the company Croatian Forests Ltd. The founder and sole shareholder is the Republic of Croatia. The company's equity is a fundamental interest, invested in things, which corresponds to the proportion of the business. The Republic of Croatia has assumed the underlying shares and the entry in the register became 100% owner. Governing bodies of the company are the Assembly, the Supervisory Board and the Management Board.

### **2.2. Methods**

In research were applied scientific and research methods: descriptive method, normative method, deductive method, comparative method, the survey method and the analysis of the strategic plan method.

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12 Račić, D., Cvijanović, V.: Stanje i perspektive korporativnog upravljanja u Republici Hrvatskoj: Primjer javnih trgovačkih društava. Vol. 4 No.1, Zagreb: Ekonomski fakultet, 2006. 205-216pp.

13 Official Gazette No. 13/2002

The work is based on the descriptive method, meaning that it begins with the general description of activities, estimation of the forest district office system and its impact on a company's organizational structure, explanation of rights and duties of everyone present in this interactive correlation, as well as with procedure description on how to act in order to achieve the best final results. To evaluate the current state of the forest district office structure it is necessary to use some aspects of normative methods, especially statistical data regarding the number and structure of employees, their qualifications, years of experience, level of education, way of functioning of the district system, as well as responsibilities and necessary work supplies of the forest district officer. Based on these data, it is possible to get a picture of the real situation in the forest district system in Croatian Forests Ltd. In order to obtain conclusions about the situation in forest district systems of the Croatian Forests organization deductive methods of comparison and analysis were used with the aim to show the research results in the observed period in relation to the size of the sample.

Survey method allows us to determine the possible strategic changes in the existing organizational structure with emphasis on the importance and significance of the district officer role, district structure of the forest offices and business culture in the overall structure of the organization. Research of characteristics of organizational culture included a survey of company employees with wide-ranging questions on management and operations of the Company. The questionnaire on employee attitudes was applied on 98 respondents – (49 forestry engineers and 49 district officers). Survey included their attitudes on organizational characteristics, management practices, decision making practices and priorities of the Company. It also included obstacles and advantages in governance and management, other indicators which indirectly indicate perception and level of organizational culture in the company. The aim of the survey is to obtain results which will through determining the characteristics of management practices and operations of the company enable better understanding of overall organization of the company, as well as of the forest district working model. The intention is also to emphasize the importance of organizational culture and highlight the need for its promotion and development as important advantages of the company.

### **3. Research results**

Research shown in this paper was conducted on two samples or two observed groups – employees of Croatian Forests Ltd. Research of the forest district office system and the organizational culture in 2003 encompassed forest district officers and forest office managers, while the later survey on assessment of district system in 2004 encompassed forest managers and their deputies, Management Board members and heads of expert services in the Directorate or expert departments in Forest Administration.

#### **3.1. The attitudes of employees**

Respondents were asked to allocate 100 points among the listed options and thereby assess the organizational characteristics of the Company. Table 1 shows the results with the average number of points that allocated to particular characteristics.

Results show that the highest score on all three levels of the company (30.8 - 52.3 to 62.7), is assigned to setting of standards, hierarchy and bureaucratic ways of functioning. Respondents recognized them as main features of Croatian Forests Ltd. On the other hand, the lowest total score (forest district officers and managers together) at all three levels is assigned



to creativity, adaptability and innovation (16.9 to 13.3 - 9.7). Between forest district officers and forest managers there is a high degree of compliance in "highlighting the common values, goals and active participation" as the characteristics of companies (- 28.56, R - 27.03 at the Forest Office), and "enterprise and creativity "(U - 12.6, R - 6.62 on the company level). In other characteristics, the results among forest managers and district officers are divided.

Table 1: Properties that best describe Croatian Forests Ltd. (Average score for each property)

<b>Properties</b>		On the level of Forest Office	On the level of Forest Administr.	On the level of CF Ltd.
1. Emphasis on common values and goals, active participation, cohesion, family	U	28,56	14,49	10,9
	R	27,03	12,16	9,86
	x□	<b>27,82</b>	<b>13,36</b>	<b>10,39</b>
2. Emphasis on rules, hierarchy, schematisation, birocratic way of functioning	U	22,4	42,31	55,77
	R	39,5	62,89	70
	x□	<b>30,8</b>	<b>52,33</b>	<b>62,7</b>
3. Emphasis on dynamics, goal orientation, client orientation, efficiency orientation	U	27,3	26,79	20,64
	R	21,6	14,86	13,51
	x□	<b>24,6</b>	<b>20,99</b>	<b>17,17</b>
4. Emphasis on entrepreneurship, creativity, flexibility, dedication to innovation and to task management	U	21,7	16,41	12,69
	R	11,8	10,08	6,62
	x□	<b>16,9</b>	<b>13,33</b>	<b>9,74</b>
Total Forest Administration	$\sum$ U	100	100	100
Total Forest District	$\sum$ R	100	100	100

### 3.2. Analysis of factors that influence decision making and priority setting in the company

Respondents determine the main factors that influence decision making and priority setting in the company. For each listed factor they chose one out of five offered importance intensities. The results are displayed separately for each level of Company. Table 2 shows that on the level of forestry office there are no factors that stand out. Replies of forest district officers and managers are evenly distributed over all five grades of intensity and impact. For almost all of the factors most frequently assigned rating score is "3". In conclusion, the majority of respondents considered that these factors at the level of forestry office "neither influence, nor not influence" the decision-making and priorities.

Table 2: Appraisal of factors which have considerable influence on decision making process and priority at the Forest office level (1- factor without influence, 5- factor with strong influence on decision making)

Decision-making factor		Share of grades in %				
		1	2	3	4	5
1. Authorities responsible for financial policy and distribution of income	U	32,56	25,58	30,23	11,63	0,00
	R	37,50	5,00	35,00	10,00	12,50
	$\Sigma$	<b>34,94</b>	<b>15,66</b>	<b>32,53</b>	<b>10,84</b>	<b>6,02</b>
2. Professional and ethical business standards companies in natural resources economics	U	25,58	6,98	23,26	25,58	18,60
	R	20,00	7,50	40,00	22,50	10,00
	$\Sigma$	<b>22,89</b>	<b>7,23</b>	<b>31,33</b>	<b>24,10</b>	<b>14,46</b>
3. Expectations of future generations (bringing back to the grand children)	U	6,98	9,30	32,56	25,58	25,58
	R	15,00	20,00	27,50	20,00	17,50
	$\Sigma$	<b>10,84</b>	<b>14,46</b>	<b>30,12</b>	<b>22,89</b>	<b>21,69</b>
4. Market and competitiveness of goods and services	U	20,93	13,95	32,56	25,58	6,98
	R	15,00	17,50	27,50	17,50	22,50
	$\Sigma$	<b>18,07</b>	<b>15,66</b>	<b>30,12</b>	<b>21,69</b>	<b>14,46</b>
5. Employer expectations (Government RH) and state (national) economy	U	16,28	23,26	32,56	18,60	9,30
	R	12,50	20,00	27,50	10,00	30,00
	$\Sigma$	<b>14,46</b>	<b>21,69</b>	<b>30,12</b>	<b>14,46</b>	<b>19,28</b>
6. Expectations from international community due to the binding international criteria's in forestry	U	27,91	16,28	34,88	13,95	6,98
	R	17,50	22,50	32,50	7,50	20,00
	$\Sigma$	<b>22,89</b>	<b>19,28</b>	<b>33,73</b>	<b>10,84</b>	<b>13,25</b>

The influence of individual factors on the decision-making at the level of forestry office is the same for managers and district officers. Among their answers significant differences can only rarely be found. The factor 6 (impact on the international community) respondents have somewhat different views. Directors consider that there is no influence (27.9%), while district officers believe it has strong influence on decision making (20%). There is a similar situation in the market and competition for goods and services (factor 4).

#### 4. Conclusion

Corporate governance implies a system of management and control of commercial operations. Quality of corporate governance should aim at company's business transparency, effective and efficient use of its resources and at establishment of relationships among the

stakeholders that will help achieve the strategic goals of society. Relevant laws contain basic rules for management of companies, while in the international corporate governance practices corporate management is determined by the code corporate governance. Legal regulations and codes form the framework to which the company adjusts partially or entirely, complementing it with its own practices according to its needs, interests, and the socio-economic environment in which the company is present.

Corporate governance conditions in the Republic of Croatia are gradually improving. Legal framework of capital market governing established the rules for corporate governance. As an extension of corporate relationships, and with recognition of internationally accepted principles and practices, the national code for corporate governance has been adopted. Most companies at least formally apply relevant regulatory mechanisms, but there is still considerable scope for improving and accelerating the process of corporate governance.

Through the analysis of the management structure of the Croatian Forests Ltd.<sup>14</sup> the need for changes in certain segments of the governance actions was identified. Within the Supervisory Board it is necessary to establish special subcommittees as the Committee for the appointment, remuneration committee and audit committee. Deficiencies in the system of corporate governance have indicated the need to establish special committees within the supervisory board. Particular emphasis is placed on the independence of members of these committees, which should guarantee the impartiality and objectivity. Objectivity in decision making, supervision of financial reports and selection of external auditors are determined as most important for management and supervisory boards.

Based on the presented results it is possible to make the following conclusions:

- Croatian forests' employees considered standardized rules, strict hierarchy and bureaucratic way of functioning as a main feature of the company. The process of decision making is centralized and has the political characteristics (level of Forest Administration and Directorate), while the decision-making at forest office and district office level is perceived as a friendly and participatory process.
- Management practices in forestry offices are found satisfactory by most of district officers and office managers
- The disadvantages and limitations of district office system arises from internal weaknesses of the company's organization (high degree of centralization in decision making, employment without criteria, insufficient education, frequent job changes, lack of creativity and innovation, lack of clear criteria for the size of district and insufficient funds for district officers' operations).

Possibilities of improvement of the district ranger system and company's business activities are: establishing clear criteria for determining the size of district office and district ranger employment, defining responsibilities, permanent education, decentralization of decision making, upgrading control systems, setting performance benchmarks and setting clear criteria for employee awarding system.

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<sup>14</sup> Tipurić, D.: Poslovno upravljanje i organizacijsko strukturiranje Hrvatskih šuma d.o.o. Zagreb: Hrvatske šume, 2009. 144pp.

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# COST AND PRICES ESTIMATION OF FURNITURE PRODUCTS USING CAD MODULE APPLICATIONS

*Eva Šebelová*

## **Abstract:**

This paper is focused on cost items analysis in production of furniture objects using CAD systems plugins. It deals with the process of making furniture product from design stage upto sale. CAD systems modules generate technological documentation based on 3D objects such as BOM, material items, list of technological operations, etc. This all corresponds to specific requirements of a consumer. Currently, created visualizations are convenient benefit of the proposal. All mentioned items can be used as the basis for cost and price estimation of products in furniture industry.

## **Key words:**

CAD systems, CAD module application, cost estimation

## **1 Objective of the article**

This article is focused to explain procedure of cost estimation for furniture products using a modular CAD system. Individual CAD systems use different types of cost estimation processing. The article deals with software analysis of TurboCAD and its extensions DAEX Generator and DAEX CUT for specific approach of this topic. The program TurboCAD is a trademark of IMSI Design, software plugin DAEX is developed by czech company ŠPINAR - Software.

## **2 CAD systems**

CAD system = Computer - aided design. This is a computer design using two-and three-dimensional modelling. CAD systems are in different price ranges with different levels of sophistication.<sup>1</sup> Most of them use system modules that are part of the program either directly or as a plug-in.

Program TurboCAD is an affordable and variable CAD software. It delivers design, drafting, and detailing parametric system. Advantage is also in 3D surface and solid modeling, photorealistic rendering in LightWorks environment, architectural and mechanical tools, and extensive file support such as 3DS, DWG, DXF, JPG, SAT, IGS and others..

The software extension DAEX Generator is fully compatible with TurboCAD. It is a special software modulus of the program TurboCAD which is suitable for furniture makers. It includes furniture library of kitchen, household and office furniture as well as the library of windows and doors. With those libraries it is possible then to work - to edit their size, material and modify the individual components such as cabinet doors, handles, fittings, etc. but also DAEX further connects the design, manufacture and trade, see Fig. 1. The moment, a piece of furniture is produced, it can be saved in a library or can be inserted into a drawing program which can be further modified. Modification allows the parametric nature of the system when

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<sup>1</sup> ŠEBELOVÁ, E.: *Bytový nábytek v prostředí ložnic a jeho řešení od návrhu s využitím nadstaveb systému CAD (Household furniture in bedrooms and environmental solutions from design to product using the CAD systém extensions)*. Brno : Mendel University, 2011, p. 52.

any change is possible almost immediately just on the basis of a simple command. As in the previous part indicated the DAEX Generator is fully compatible with the CAD program. This ensures easy operation and orientation in space drawing. Further advantage is the possibility of direct generation of the necessary documents and export them in formats such as CSV and XML, which allows further processing as table or text.<sup>2</sup> DAEX generator has a default preset template drawing. Individual working levels for the most efficient use of this plugin and its tools are adjusted in this template.

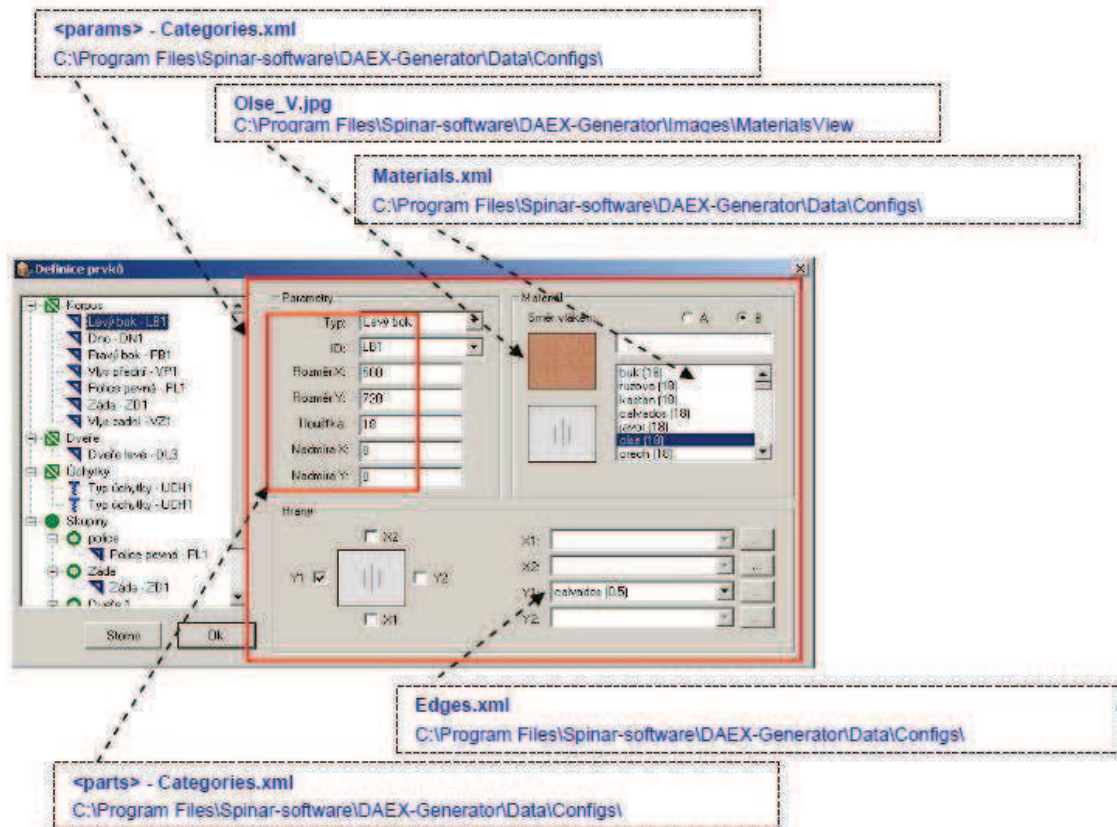


Figure 1. DAEX Generator – object parameters

DAEX CUT is actually a spreadsheet that allows the specification of the parameters of the object. It focuses on the precise definition of dimensions, direction of fibers, materials, decoration, etc., Link among DAEX Generator and DAEX CUT ensures data export functions „DAEX Cut selection“. The data is imported into a spreadsheet editor (Fig. 2). Further possible specification of object properties and their subsequent reflection in the manufacturing documents - such as BOM (bill of material), cutting plans, material costs etc. is then possible. The editor is very flexible, offers a range of any change, fittings or equipment and also it is possible to add elements, delete or changed according to the wishes and needs. It is quite flexible, individual changes and operations are actively reflected in the relevant documentation.<sup>3</sup> DAEX CUT offers work in pre-created categories – it is designed

<sup>2</sup> ŠEBELOVÁ, E.; BALÁKOVÁ, K.: *Využití nadstavby CAD systému k modelování parametrických nábytkových sestav (The use of CAD system module for parametric furniture set modeling)*. Brno : Mendel University, 2010, p. 1-6.

<sup>3</sup> ŠEBELOVÁ, E.: *Bytový nábytek v prostředí ložnic a jeho řešení od návrhu s využitím nadstavby systému CAD (Household furniture in bedrooms and environmental solutions from design to product using the CAD system extensions)*. Brno : Mendel University, 2011, p. 52.



primarily for the creation of modular cabinets. All levels of detection components are set just on the properties of boxes, which fully complies with the principle of modular assemblies.

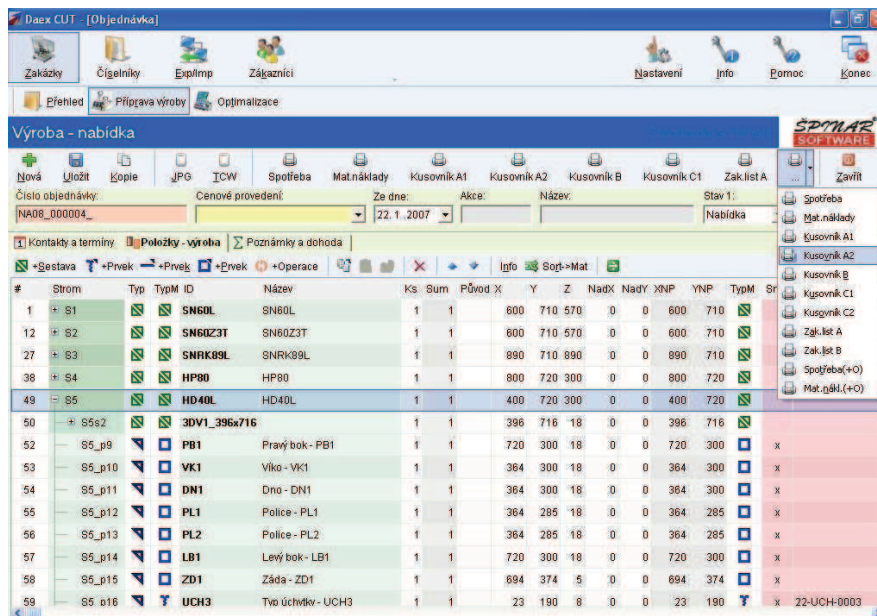


Figure 2. DAEX CUT – spreadsheet editor

But it is possible to create your own new category as well. Furniture and objects of complex structures would not correspond to standard levels. For this reason it is necessary to create your own levels of appropriate category.

### 3 CAD module applications

Cost estimation is based on 3D model. For creating modular assemblies the use of several TurboCAD tools is possible. Multiple objects are best created through symbols, blocks and groups. Blocks and groups are internal matters. The article then focuses primarily on the creation and use of symbols in libraries and on the software upgrades enabling the creation of modules as well.

### 4 Generating cost estimations

Using these extensions is ensured by an active generating of cost estimation. The system contains imported datasheets of materials, fittings and other furniture components. The created 3D model is saved as a symbol to the software library. For the most effective use of CAD module application is best to work in pre-constructed template drawing DG\_PROJECT. The object have to be put into different levels. This ensures detection of individual components at the appropriate position on the 3D model. Then it is selected the type of material, including thickness, decor, edges and direction of fibers and the required fittings - again from the datasheet of furniture makers. The setting data are imported into a spreadsheet DAEX CUT. Here it is possible to edit, modify, delete and add any other data. All properties of an object can be specified and each change is actively reflected in the documentation. Cost estimation is generated by the module itself. It counts the material consumption and purchased components. These items are direct material (Fig. 3).

MATERIÁLOVÉ NÁKLADY → „DIRECT MATERIALS“ NA10\_000018\_SSW

ID materiálu	Název materiálu	Mezisoučet:	Množství	Cena
<b>— Délkový materiál</b>				
42-18-1111	HRANIPEX HD 48403	15,00 Kč	24,16 m	362,34 Kč
Mezisoučet:				362,34 Kč
<b>▣ Plošný materiál</b>				
21-05-4571	KRONOSPAN OR (4)	130,00 Kč	1,57 m <sup>2</sup>	204,10 Kč
21-18-4571	KRONOSPAN OR (18)	180,00 Kč	2,54 m <sup>2</sup>	456,84 Kč
Mezisoučet:				660,94 Kč
<b>Celkem:</b>				<b>1 023,28 Kč</b>

Figure 3. DAEX CUT – direct materials

Cost estimation is based on a calculation formula that divides the direct and overhead costs.

Direct costs:

- direct material costs
- direct labor
- other direct costs

Overhead costs:

- production costs
- administrative costs
- the cost of disposing

Price of the product is based on the price calculation. It is always necessary to add profit. The price of a product is defined as costs plus profit. This price is specified primarily in job-work production where the market does not determine the price of a product.

$$P_w = C_p + P_p$$

where  $P_w$  – price of the product  
 $C_p$  – total costs of the product  
 $P_p$  – profit

CAD module applications in the described system indicate only direct material costs. But the advantage is the ability to link these extensions with the accounting programs such as POHODA, etc. Then manufacturing companies can easily export the relevant documentation and transfer data into an accounting program. Connection of such programs then means a significant advantage.

## 5 Conclusion

CAD systems have recently become an integral part of the furniture production. The TurboCAD offers all necessary tools for large-scale production, but also for job-work production. Software extensions are a great addition. They facilitate the work for furniture makers and it is necessary to emphasize their positive price.

In CAD module applications cost estimates are made up of material consumption. Other direct and overhead costs should be either entered manually or be exported to accounting programs. Usual accounting programs communicate well with CAD modules mentioned above. Furniture products created with support of CAD extensions could be can be subsequently handled in other systems thanks to interconnection of applications.

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# THE POSITION OF WOOD INDUSTRY CR AND ITS CURRENT ECONOMIC PROBLEMS

*Jan Štěpánek – Tomáš Najbrt*

## **Abstract:**

The timber industry belongs among the driving forces of the world economy. It is an important employer in many EU countries and is among the top 3 industries in Austria, Finland, Portugal and Sweden. It employs nearly 3 million workers within EU-27. In the CR it remains a smaller processor regarding its sales volumes. It has a share of only 2,8% within the manufacturing industry. In 2008 there was a decrease of production associated with a decrease in the number of employees. The biggest decline in jobs occurred in sawmilling, about 10%. Revenues declined year-on-year in the construction and joinery production by 4% and more than 12% in wood industry. Losses of jobs within the industry are so critical that woodworking industry is more or less evenly dispersed throughout the territory of our country. A similar process is expected in the final results for 2011.

## **Key words:**

woodworking industry, construction, foreign trade, investment

## **1 Introduction**

The level of use of wood is an image of maturity of every nation. Wood is an organic material and creative of the future. Consistent use and maximal exploitation of domestic resources is a feature of advanced economies. These materials include wood, especially in the CR. It is considered by experts as one of the most promising raw materials and also as a key material of the future.

The timber industry is considered one of the driving forces of the world economy. It is an important employer in many Member States of the European Union. In Austria, Finland, Portugal and Sweden it is one of the best industries. Companies are often located in remote, less developed areas, which contributes significantly to the rural economy. The total number of enterprises in the EU timber industry is estimated at 380,000. Approximately 150,000 from this number belongs to the furniture industry (NACE 31) and 280,000 to the woodworking industry (NACE 16).<sup>1</sup>

The manufacturing industry in the Czech Republic is one segment of the woodworking industry with the oldest tradition. Everything is based on the fact that wood is permanently a basic raw material for production of renewable base. The importance of timber and timber products consists mainly in the fact that they are applied in the sectors which currently form one of the basis of gross domestic product. It is a construction, agriculture, automotive and transport. In our daily life we meet especially products of joinery, carpentry and furniture manufacture.

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<sup>1</sup> JAEGER, F.: *Memorandum of the woodworking industries to the European institutions*. [online]. Bruxelles: CEI-Boisaisbl, 2009. Available from: [http://www.cei-bois.org/files/Memorandum%202009%20FINAL\\_with%20covers.pdf](http://www.cei-bois.org/files/Memorandum%202009%20FINAL_with%20covers.pdf)

Power woodworking industry as well as the furniture sector is highly dependent on the performance of construction. Construction currently represents approximately 12-14% of the average GDP of EU Member States.<sup>2</sup>

## 2 Building

Constructing is stagnating in the whole Europe. Czech building output, according to preliminary statistics, continues to deteriorate. Construction output fell in 2011, up by an additional 3.5%. Compared to the conjuncture in 2008 we can see an even bigger drop of more than 11%. When comparing the seasonally adjusted data we find that the index of building production in the EU27 in 2011 slightly increased.

Construction in ČR recovered only from December 2011. The annual declines, however, occurred in 2009 (-0.1%) and 2010 (-7.1%). The fall didn't widen due to the growth in the last minute. Building construction rose in December by 13.8% and contributed to the positive outcome of the last quarter. Construction output rose by 0.4% year on year, however, the number of employees in the sector continues to decline.<sup>3</sup>

## 3 Woodworking industry

In the western Europe there is the highest increase in raw material costs and wages in the world in the imber industry in recent years . Manufacturers were forced to use the latest technologies to guarantee the competitiveness of their products and profitability. Technological development also passed other activities, such as logistics, transportation, supplies, etc., which have contributed to the quantitative and qualitative competitiveness of timber industry.

Technical development determined the major exporters, such as Finland and Sweden. New technologies are developing today mainly in terms of efficiency and development of products and services with higher added value. Manufacture of builders' carpentry with its 37% share of sales in 2008 (see Tab.No. 1) from sales of own products and sales is at the forefront of other wood processors. Following sawmilling and planing of wood with 30%, then the other manufacturings products with 20%. The production of woodpackaging has the lowest share of the sales of 6 %.

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<sup>2</sup> DUBSKÁ, D: *Comment: Data about industry and building are not so bad in the end.* [online]. Prague: Czech Statistical Office, 2012. Available from: <http://www.czso.cz/csu/csu.nsf/informace/c020612analyza12.doc>

<sup>3</sup> CUŘÍNOVÁ, P.: *Construction – February 2012.* [online]. Prague: Czech Statistical Office, 2012. Available from: <http://www.czso.cz/csu/csu.nsf/informace/csta040612.doc>

Table 1: Sales of own products and services.<sup>4</sup>

Sales of own products and services	2006	2007	2008	
			Revenues	% share in total sales
Sawmilling and planing of wood	19857287	21166231	17513548	30
Manufacture of veneer sheets, plywood and agglomerated materials	11578737	13750118	11432289	20
Manufacture of builders' carpentry, joinery	21183233	22263363	21526702	37
Manufacture of wooden containers	3206942	4656657	3279102	6
Manufacture of other wood products, except furniture	4370495	4282078	4351992	7
Total	60196694	66118447	58103633	100
The annual index	x	109,8	87,9	

Looking at the entire manufacturing in 2009 (see tab. no. 2), the independent timber industry in the CR is really just a small player with a 2.8% share of total sales. Leadership continues to maintain the production of motorvehicles (CZ-NACE 29), that was involved in 19.4% of total sales. Unlike other industries, wood industry has a 97.75% share of domestic companies. This fact is not just a question of market share, but mainly one of the most important macroeconomic indicators. This is the question of employment in all regions of our country.

Table 2: Sales of own products and services in the manufacturing.<sup>5</sup>

(tis. Kč)	2005	2006	2007	2008	2009
CZ NACE 16.1	21021732	23442323	26012602	23633113	21122235
CZ NACE 16.2	52664635	59929281	67665020	64979122	55601937
CZ NACE 16	73686367	83371604	93677622	88612235	76724172
The annual index	x	113,1	112,4	94,6	86,6
Total manufacturing	2708952009	3029353956	3317853476	3271606761	2707216980
% Representation CZ NACE 16 in manufacturing	2,7%	2,8%	2,8%	2,7%	2,8%

A more detailed analysis of documents from the Industrial Classification finds one specialty. It is almost an even distribution of individual plants or companies across the whole country. Another feature of the field is a higher number of employees comparing to other indicators such as productivity calculated from VAT. To enable a competitiveness of timber industry with other disciplines as well as in the above-mentioned values, it was necessary to join the restructuring and rationalization measures of production in the years 2005 to 2009 and reduce the number of employees (see Tab. 3). The numbers have been decreasing on average by 10%. (Year 2005, 44,623 workers in 2009, only 40

<sup>4</sup> FILGAS. P. *Panorama of manufacturing industry in CR 2008*. [online]. Prague: Section 06000, Ministry of industry and trade of the Czech Republic, 2009. Available from: <http://www.mpo.cz/dokument65939.html>

<sup>5</sup> FILGAS. P. *Panorama of manufacturing industry in CR 2010*. [online]. Prague: Section 06000, Ministry of industry and trade of the Czech Republic, 2011. Available from: <http://www.mpo.cz/dokument102273.html>



382 workers). The crisis in 2008 contributed to the reduction of places too. . The largest share of job losses resulted in sawmill production.

Table 3: Number of persons employed in manufacturing. <sup>6</sup>

(osob)	2005	2006	2007	2008	2009
CZ NACE 16.1	11069	10386	10187	10149	8993
CZ NACE 16.2	33554	34533	34564	33695	31389
CZ NACE 16	44623	44919	44751	43844	40382
The annual index	X	100,7	99,6	98	92,1
Total manufacturing	1183683	1196178	1224862	1221583	1067206
% Representation CZ NACE 16 in manufacturing	3,8%	3,8%	3,7%	3,6%	3,8%

#### 4 Foreign trade

Timber industry showed in 2009 the negative balance of foreign trade in the amount of CZK 9,012 million (see Tab. 4). Czech wood industry exports many products to EU member states, especially in the Germany and neighboring Austria. The Germany is supplied mainly with timber, joinery products and pallets. Austria is particularly interested in logs, lumber, veneer, plywood and agglomerated products. About 79% the entire production of CZ-CPA 16 is exported to EU countries. Germany and Austria are the first two places in foreign trade in the timber industry, in the case of export, import Slovakia lies on the second place.

Table 4: Foreign trade in CZ-CPA 16 in bc in 2009<sup>7</sup>

Kód	CZ-CPA 3 místa	Rok 2009				
		Dovoz v mil. Kč	Vývoz v mil. Kč	Saldo v mil. Kč	Čistá hmotnost v kg	Kg cena v Kč
16.1	Wood, sawn and planed	8139,9	4322,8	-3817,1	32292022	252,1
16.2	Wood and cork wicker and straw products	11705,5	6510,6	-5194,9	73021517	160,3
16	Wood products in total	19845,4	10833,4	-9012	105313539	x

As already mentioned development for the years 2005 to 2009 showed the position of the wood processing industry is not particularly satisfactory. The international situation in the years 2010 to 2011 yielded the expected increase in construction output in the planned percentage. This also led to stagnation or even decline in production due to the heavy interdependence between production and joinery construction.

<sup>6</sup> FILGAS. P. *Panorama of manufacturing industry in CR 2010*. [online]. Prague: Section 06000, Ministry of industry and trade of the Czech Republic, 2011. Available from: <http://www.mpo.cz/dokument102273.html>

<sup>7</sup> FILGAS. P. *Panorama of manufacturing industry in CR 2010*. [online]. Prague: Section 06000, Ministry of industry and trade of the Czech Republic, 2011. Available from: <http://www.mpo.cz/dokument102273.html>

## 5 Investments in the woodworking industry

Large investments in R &D facilities are required to improve the situation. (EU funding for research and development money provides the largest community program, whose political aim is to support Europe's competitiveness. For the period 2007 to 2013 € 54.6 billions are allocated) Thus we have to achieve higher labor productivity, product quality and thus better applicability of the products on the market. You will also need to focus on the increasing number of use of wood as a construction material. To enable the achievement of project goals timber companies can draw money from the Operational programs Start, Warranties, Development, Co-Clusters and Innovation. TIP is another program that is designed to support research and development. 95,5 millions of crowns are earmarked for projects targeting wood-based industry (according to Ing. Muřický Edward, director of strategy and trends from the Ministry of Industry and Trade).<sup>8</sup>

## 6 Result

Czech wood-processing industry is able to produce competitive products in all its branches. It has good prospects for further development and increase the volume and quality of production, and even categories of sophisticated products. The proportion of wood products with quality labels has increased. The implementation of chain of custody certification of wood products, according to the PEFC system and the FCI continues. The impact of REACH legislation on chemicals on the whole industry, in terms of covering increased costs is very small. An approximation of EU legislation into Czech legislation has been taken. The relevant legislation and EU directives are consistently respected, with emphasis on environmental protection (IPPC), including the issue of waste solutions.<sup>9</sup>

A key issue for further development remains the wood industry respectively increase of the competitiveness of our manufacturers. The industry must continue to incorporate the latest scientific knowledge, new technologies and the application of modern management methods. It will be an important concentration of production into larger units, which should guarantee the achievement of high labor productivity and production of products with higher added value. Czech manufacturers in the wood industry are sought after suppliers in the markets of EU countries in the world. Favorable conditions exist in the area of strengthening cooperation in science and research. Considerable extent, the trend in that they participate as vocational secondary schools and vocational high schools. Create deeper links between theory and practice. An important goal has to be the preparation of students for work focusing on economic issues and the wider economy business woodworking industry.

Three key factors will have the greatest significance according to experts. The first one is the improvement of access to financial assets. Another important factor is the need to increase the share of products with higher added value and to achieve higher financial evaluation of materials. The third key factor are large reserves for the development of timber industry, which lie in the increase of domestic consumption of wood products. The public authorities, professional associations and individual companies have taken a series of actions designed to change the attitude of Czech population to products made of wood. Currently, the

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<sup>8</sup> BVV TRADE FAIRS BRNO, PRESS ROOM.: *Further stagnation timber industry would mean its demise.* [online]. Brno: BVV Trade Fairs Brno, 2011. Available from: <http://www.bvv.cz/wood-tec/wood-tec-2011/aktuality/dalsi-stagnace-drevozpracujiciho-prumyslu-by-zname/>

<sup>9</sup> JAEGER, F.: *Tackle Climate Change: Use Wood.* [online]. Bruxelles: CEI-Boisaisbl, 2011. Available from: [http://www.cei-bois.org/files/FINAL\\_-\\_BoA\\_-\\_EN\\_-\\_2011\\_text\\_and\\_cover.pdf](http://www.cei-bois.org/files/FINAL_-_BoA_-_EN_-_2011_text_and_cover.pdf)

domestic consumption of wood and wood products is at 30 to 40% of EU average. The whole timber industry has to be more visible to improve this situation. It is not possible, as before, to proceed only at the level of specific companies or firms. The branch clusters should assume more responsibility for promoting the sector. The main strategic partner of the Czech wood-processing industries is construction industry, especially housing.<sup>10</sup>

The planned growth of housing construction could be therefore added as another important factor of development. Other potential sources of development are public procurement and construction business. It also includes the reconstruction of prefabricated houses. Roof in-built structures, reconstructions of unused buildings into flats, etc.

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# CREATION OF CALCULATED PRICE IN CUSTOM MANUFACTURING OF FURNITURE

*Katarína Teplická*

## **Abstract:**

Creation of calculated price of products in custom manufacturing of furniture is very different. Today is custom manufacturing of furniture very extended and therefore is creation of calculated price important. Small manufacturers of furniture do not create calculated price on the ground of using modern instruments for creation of price and calculated price does not include all costs for custom manufacturing of furniture. In this article we point out that the creation of price is very important for small manufacturers because the price of furniture affects their business. Calculated price that it does not include all costs of product, it can reduce profit or it can bring insolvency.

## **Key words:**

price, costs, product, profit

## **Introduction**

Creation of calculated price is very different in custom manufacturing of furniture. Small businessmen define different valuation methods of products in production of furniture, they product by customer's requests. The price is important factor for customer and very important key factor for successful order. Custom manufacturing needs to change the creation of calculated price of products and the calculated price must accept competition and customer requests. We can create the calculated price of competitive price, of customer price, of actual costs of order.

## **Goal of project**

We will evaluate calculated price in custom manufacturing of furniture and we will evaluate influence of this calculated price on product and impact on expenses and profit.

## **Analysis of project**

Costs of product create the base of sale price. The final sale price depends to relationships between seller and purchaser. This sale price depends on a lot of factors e.g. quantity of production, relationships between purchasers, competitive offers. The sale price must create maximum economy profit. In praxis firm offers two ways of products: products produce by own production activities and products that are buying for order. This firm has custom manufacturing of furniture because it produces order by customer requests. This firm produces different products or little series of products. The calculated price determines the price of one order and all costs of this order. This firm creates calculated price from direct material, direct lower and manufacturing overhead by the index, that it was intended for base analyses from last years. This access deck minimal cost of order and it contains profit.

Calculation of less difficult order determines by following formula:

**Costs of direct material on order x index 2**

Calculation of difficult order determines by following formula:

**Costs of direct material on order x index 2,5**

The firm buys products, that it does not produce and it sales this products by 20 % surcharge to final customer. This creation of calculated price is very easy and fast and it is her advantage. Disadvantage is fact that this calculated price does not contain all real costs of order and this price does not make provision for customers and price on market and competitive price. This calculated price does not contain all the costs of order. This calculation method can present distorted fact for example price or effect of the firm.

We can calculate kitchen unit as one complete order. The price of this order is created by the firm method through index. Creation of the calculated price will be realize by direct costs of material and index 2,5 because this order is difficult.

**Realization of this order consists of following working activities:**

1. Measuring of kitchen unit – worker localizes in place the kitchen unit, he makes preliminary draft of kitchen with customer,
2. Selection of material - customer choose material and color of material,
3. Calculation of price and consumption of material - following by measuring material calculate quantity of direct material, necessary on production given assistance, and the price of this material,
4. Price offer for kitchen unit.

Following working activities we prepared calculation to order – kitchen line by valid methodology that the firm uses. Direct material is presented in table 2, other material is presented in table 3, this material is higher about 20 % surcharge, because it is material, that the firm buy this material through provider, it is not material produced by firm. Overhead charges in the firm contain item of job costs that are inclusive activities as measuring, import, installation of kitchen link and other overheads charges consumption near production order. General calculated price of this product is 2660, 46 € with application of method, that the firm use. This calculated price is price of order and together with value added tax creates final price for customer.

Table 1: Calculation of kitchen unit.

Costs	v €
Direct material	727,26
Different material 20% surcharge	842,30
Overhead charges k=2,5	1090,89
<b>Costs of product</b>	<b>2660,46</b>

Source: own source



Table 2: Calculation of direct material.

Type of material	Consumption	Price in €/unit	Final price
DTD	29 m <sup>2</sup>	8,96	259,91
ABS 22 x 2 mm,	80 m	0,66	53,11
ABS 42 x 2 mm		1,33	0
DTD 16 mm	2 m <sup>2</sup>	5,97	11,95
Stripe	4 m	0,66	2,66
Sololit	11,6 m	2,99	34,65
Work desk	2 ks	69,71	139,41
HPL stripe	1,5 m	0,83	1,24
Screen		82,98	0
Skirting legs 10 cm	28 ks	0,46	13,01
Suspender I	28 ks	0,43	12,08
Suspender II		0,56	0
Suspender 45°	4 ks	1,13	4,51
Suspender		1,26	0
Suspender		3,52	0
Set square	16 ks	0,27	4,25
Piston		9,63	0
Suspension		2,32	0
Skep 15	1 ks	63,07	63,07
Tandembox 45 cm		31,87	0
Tandembox 45 cm with 1 relingom		36,91	0
Tandem 50 cm		12,74646	0
Portable 45 cm	1 ks	1,26	1,26
DTD	10 m <sup>2</sup>	8,3	82,98
ABS 22 x 2 mm,	65 m	0,66	43,15
<b>Total costs:</b>			<b>727,26</b>

Table 3: Calculation of different material

Type of different material	Amount	Price per unit	Total costs in €
Dustbin	1 ks	116,18	116,18
Wash bowl BLANCOTIPO 9E	1 ks	122,82	122,82
Tandembox 50 cm	4 ks	31,87	127,46
Tandembox 50 cm with 1 relingom	3 ks	36,91	110,73
Glass	0,9 m <sup>2</sup>	79,67	71,70
Sharping	6 ks	3,98	23,90
Clip anchor 12111	5 ks	4,98	24,90
Clip anchor 12939	21 ks	2,66	55,77
AVENTOS HKS	2 ks	24,23	48,46

<b>Total costs:</b>			<b>701,92</b>
<b>Price with 20 % surcharge</b>			<b>842,30</b>

## Application of job-order method of calculation

Job-order method of calculation utilizes all firms that are oneself dealt by piece production or short-run production. It is a production process where the product is produced by individual customer's requests. This job-order method detects costs on concrete order, because every order has different requests. With application of job-order method of calculation we can obtain actual costs for calculated price of product. We can get relevant information about using methods and we can confirm correct methods of calculation when we compare method with index in the firm and job-order method of calculation.

Following job-order method of calculation, which is going out of items of costing formula, we are found actual costs to one order. Calculated price is 2832,50 €, what it introduces increasing about 172, 04 € as that of method using index. We can confirm the fact, that this method using index is not useful to calculate costs of product because it does not contain all information and items of calculated price. This calculated price does not contain item of value added tax and profit.

Table 4: Calculation of order by job-order method.

Structure of costs	v €
Direct material	1 429,18
Direct wage	286,00
Different direct costs 13,4%	38,32
Overhead charges	1 079,00
<b>Total costs</b>	<b>2832,50</b>

### Steps of account calculated cost on order:

**Determination of direct material** is located on the ground of actual consumption of direct material that the order needs. For kitchen unit is direct material in table 2 and the different direct material in table 3 without 20 % surcharge.

**Determination of direct wage** – Two employers will make order - carpenters. The work effective fond of one employer is 1920 hours by 40 hours for week. Total annual work plan for two employers will be 3 840 hours. The base pay for one employer is 370 € and daily work one employer 8 hours, his average wage for month is:

$$\text{Average wage} = (\text{total wage} / \text{the number of time usage}) / \text{time usage for day} = \\ = (370 / 21) / 8 = 2,20 \text{ EUR} / \text{hod}$$

The order realized two employers together 130 hours by average wage 2,20 €/hours.

**Direct wage together** =  $130 \times 2,20 = 286,-EUR$ .

**Determination of different direct costs** is formulated in percent of direct wage.

**Determination of overheads charges on order** – we use total overheads charges from financial accounting of the firm. This value is 207 265 € in table 4.

The account we make by overhead rate that is determined as ratio total costs to total time usage on order. The time usage for one year for all employers is 24 960 hours.

**Hour overhead rate** =  $\frac{\text{total overheads charges}}{\text{time usage for one year}}$   
 $= \frac{207265}{24960} = 8,30EUR / hod$ .

Than costs of one order are  $8,30 EUR/hour \times 130 hour = 1079 €$ .

Table 4: Structure of overhead costs.

Overhead charges	v €
Leasing	24 852,-
Depreciation	34 477,-
Expenditure of energy	7 800,-
Overhead material	60 578,-
Fuelling	5 831,-
Repair and maintenance	2 877,-
Lowers	17 280,-
Insurance	26 250,-
Communications	3 923,-
Other services	21 620,-
Taxes and fees	1 777,-
<b>Total costs</b>	<b>207 265,-</b>

## Conclusion

We determined by comparing of method by index and job-order method, that the order of kitchen unit was produced with loss, because the calculated price by index method was lower as calculated price by job-order calculation about 172,04 €. The firm did not accept

actual overhead charges by enumeration and than the calculated price was lower as actual calculated price. Calculated price 2 660, 46 € uncovered total cost and profit for product and index is defined incorrect.

Table 5: Comparison of calculated price.

Structure of cost	Calculation by index	Job-order calculation
Direct material	727,26	1 429,18
Direct wage		286,00
Different direct costs	842,30	38,32
Overhead charges	1090,89	1 079,00
<b>Total costs</b>	<b>2660,46</b>	<b>2832,50</b>

We can state following comparison of calculation methods that it will be better for the firm to use job-order calculation and the calculation method by index is not convenient for the firm. Therefore we recommend for the firm these steps:

- ❑ to use job- order calculation for kitchen unit, because this calculated price contains all actual cost of product,
- ❑ to reevaluate index of calculation, because this index must accept profit and all costs of product,
- ❑ to revalue system of cost evidence, to introduce new way of cost accounting, that it would allow more detail of individual expenses items, that it would allow new application of calculated price,
- ❑ to monitor prices on competitive market, demand and rate after products in furniture manufacturing.

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## **CHAPTER 3**

### **NEW TRENDS AND CHALLENGES IN WOODWORKING INDUSTRY**

# WOOD HOUSES – THE CHALLENGE TO TASTE NEW STYLE OF LIVING AND ADDED LUXURY TO ADORE SLOVAK NATURE

*Lucia Abdrabou*

## **Abstract:**

This article points to the brand new way of presenting well known material – wood – as building material of incredibly durable wood houses. Have you ever been thinking about any special place to live in? Would you like to live differently but enjoying difference for rest of your life? What about modern style of living but still elegant and health saving way? This and more opportunities are hidden in the simply called wood houses. They have been considered as the new trend in wood housing that attracts new markets as well as offers list of various openings at tourist traffic. The main goal of this article is to describe reasons why wood houses are special for being used as a tool to gain new customers – consumers – users and of course why it influences attraction of tourism segment.

## **Key words:**

wood houses, segment, lifestyle

## **Introduction**

One of the basic human needs is to solve the housing. Ideas on how housing is different, but always outweighs the interest of a house compared with a flat. Most people desire to own a piece of land, garden and especially the life of the neighborhood without unnecessary conflict by spreading a thin wall of the apartment. Since we live in a time of opportunities and surplus, people are increasingly interested in new and different offerings. Everyone wants to be original as it is linked to lifestyle. The lifestyle is made by selecting the products that satisfy our needs, that includes choosing the right house. This paper focuses on a new way of living - woodhouses that deliver customers more than just a specific lifestyle. Thanks to their design, they satisfy the diversity of market demand, while their treatment is economical and environmentally focused.

### **1 Wood as building material**

Currently slovak people rather prefer brick houses, but few know that these materials are among the most expensive. Wood as a building material is as good as other materials, but greener, healthier and cheaper. Wood people consider the past building material, but this idea is really wrong. Wood brings the same qualities which have brick houses, and we can say that as a building material also brings some added value. These are the qualities beneficial to the health of residents of such homes as well as kinder and more responsible approach to nature.

#### **1.1 The advantages of wooden house**

Wooden houses have several advantages. The biggest advantage is speed of construction of this house, but also the construction of a dry process. This means that the wet process for the construction of timber construction can be eliminated, as well as errors and disturbances caused by the influence of technological wateriness. Customers can move and

use wooden house immediately after ending building and their investments are recovered immediately too.

Another advantage of wooden houses are excellent thermal insulation properties. This means that the wood is able to assume and maintain heat from the environment. It also binds moisture, which in the event of dry air in the house, comes back. The reason of these properties is that a standard house is usually made with a wooden wall mounting frame with inserted thermal insulation, which is externally covered another layer of insulation with a ventilated space. It is this method of insulation of wooden houses that makes another advantage, which is the ability to provide required or special thermal protection without substantially increasing the structural thickness of external walls, which stops further increase in investment costs. Therefore, wooden constructions achieve excellent thermal properties (low thermal conductivity, surface emissivity friendly wood), because of which they have a low heat consumption and the indoor temperature can be better controlled. Wood can provide 3.5 times better thermal protection than a brick house and 8 times better than the construction of the concrete.<sup>1</sup>

Lifetime and durability of wooden houses is one of the issues that we need to know the answer. Durability of wooden houses is estimated from one hundred to two hundred years, but we should take into account the so-called moral lifetime, which is estimated around 50 years.

Resistance of these houses is focused on the aspect of natural disasters. In this area, woodhouses are more resistant to earthquakes and floods, but on the other hand, less resistant to storms. Wooden houses are just as safe as other houses in the event of fire. In the process of preparing the wood before actual construction is wood treated with special coatings against pests, insects, moisture, and also for fire protection purposes. An interesting fact is that in case of fire, the wooden structure is more resistant to fire, as the surface chars and interior wooden construction holds, and the steel beam at a certain temperature for a permanent temperature can twist and collapse. Of course, in strong fire it is about the time, but wooden house provides it to its residents in case of emergency.

## 2 **Woodhouse - house like any other?**

We can answer this question both, positive and negative. Yes woodhouse is like any other house, as it fulfills the same function of housing, it has a similar architecture, interior and exterior, including a front garden. At the same time its different in many other directions. Although the architecture is similar, but the wooden material makes it specific. Wood acts as a warm and family impression, natural look evokes a pleasant feeling of a real home. The cottage was previously a symbol of warmth of home and family barbeques. There is also the possibility of adapting the facade to the customer, when you won't recognize it from classic brick house facade. As for the interior, the customer also has the choice whether to orient the natural direction and leave the natural elements of wood, or will decide for a modern interior design. It is distinguished by its advantages, which I previously mentioned.

Since customers are now demanding and careful in choosing housing, we should bring the reasons why woodhouses are still more attractive. Among these reasons we include

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<sup>1</sup> MIRALI: Výhody domu. In : Drevené domy. [online].2012.[cit. 2012-04-28]. [http://www.mirali.sk/stranka/5/vyhody\\_domu](http://www.mirali.sk/stranka/5/vyhody_domu)

location of the construction, building materials, architecture, exterior, interior and added value compared to traditional brick house.

## **2.1 Location**

Before construction of any building, there is a priority to determine the location of construction. With such a choice plays the role several factors such as suitability of environment, plot, project of building, transportation availability and amenities and, finally, price. Customers have the opportunity to consult on these factors through counseling services of the companies that are dedicated to building wooden houses. Location of woodenhouse is also important because of the project itself, which adapts the properties of building materials - wood, so that the building could be fully protected and designed the way to long remained without any failures caused by bad design. The selection of the location is on the customer, he can get advices from consultant, or if he has selected some design, the consultant will explain the pros and cons. For the construction of wooden houses, there are many options, location selection is not limited to specific geographical areas. Customer can fulfill his dream of a combination of his favorite place with housing in his own wooden houses.

In terms of construction of wooden houses in areas used for tourism such as Liptov and Orava region, are woodhouses interesting for the customer - entrepreneur, who can purchase such woodhouse by investing in a project for constructing wooden houses.

Location is also important for tourism because it is a crucial factor in choosing a holiday stay. Customers are oriented in the Slovak environment according to the availability of services embedded in a beautiful environment. Popular areas are for example Liptov and Orava. Therefore, woodhouses offer their services in these areas. Companies are trying to build a complex of wooden houses, which investors can offer to their customers. Advantages over traditional hotels in the vicinity of these areas and cottages directly in these areas, is their connection in wooden houses. Woodhouses can be placed directly in the field without affecting the nature or the aesthetics of landscape and still provide the same luxury which provide hotel facilities.

## **2.2 Process of building**

The customer satisfaction also depends on the rate of completion of its wishes. Of course not at the expense of quality. In the process of building the construction of wooden houses construction process is shorter than with the classic brick building. The reasons we have already identified in the previous chapter, but the main advantage is the elimination of wet process, which considerably slows down the progress of the construction phase. With the wooden houses, the process is much shorter, also coupled with the possibility of immediate occupancy. Customers appreciate the speed of construction mainly because despite of the fact that most of them are planning the house process, are forced to adapt to many life situations when they need to finish as soon as possible.

## **2.3 The basic building material**

The basic building material is wood, wooden constructions of spruce, fir and pine. Innovation in this field is the cedar, whose lifetime is three times longer than the spruce. Cedar wood grows from 600 to 800 years and makes longer life to the building of cedar wood as well. It has a unique smell, creating a unique atmosphere in the interior of the log building. Other advantages are: pronounced hardness and strength, resistance to cracking, drying out

and rot. The cedar has the best quality of all materials for the production of log houses. In terms of customer, wood as a building material is useful, especially because in comparison with the same brick building, wooden surface provides from 8 to 10% bigger residential area.<sup>2</sup>

## 2.4 Architecture

Architectural design of wooden houses are in charge of professional planners. The customer will bring forward their ideas and draw up proposals for the designer. Together, they find a suitable solution and construction can begin. There is offer of several types of architectures. Each company offers a previously constructed generalized models of wooden houses which are generally desirable and popular. Wooden houses can be built as bungalows, or otherwise known as single-floor homes, they also offer a two-floor houses, and even such sizes that the house could become an apartment. Some manufacturers offer a US-style houses, otherwise known as sandwich houses, which façade of wood houses is indistinguishable from traditional brick house. Customer can design facade himself, or choose a color or type of facade. Another element of the architecture of wooden houses is the way of wood treating. Wood house can be made from machined squared log, or pre-selected, prepared and treated timber.

## 2.5 Exterior

Exterior properties depend on the project, which the customer chooses. In selecting the method of processing of materials of construction, the customer selects the facade as well. It may be left in a natural style, or customer may choose an American style and characteristic wooden shelter hide from the environment. Of course, the exterior made of the customer choices, includes a style of terraces, balconies, windows, external stairs and front door. All these aspects, however, consult with the designer.

## 2.6 Interior

To make customer satisfied, there must exist a number of options from which he can choose. It should not only have a choice, but also the opportunity to apply their own ideas and suggestions. The basic styles that companies offer to customers are to remain in a natural style and to reclaim interior, or to offer the opportunity for a complete change for demanding customers, which means that the interior again does not differ from classic brick home interiors. It is therefore once again on what the customer has an idea, if he will live in a natural or modern style. With the wooden houses is possible almost everything, so the customer does not feel constrained and can gain a healthy living style in wooden houses.

## 2.7 The added value

Currently a desirable added value of every building is its wholesomeness. Moreover, it is a good insulator, which at 10 percent moisture can download charge of electric field from a man or a building, is also suitable material for allergy sufferers and children. Wood absorbs noise, hence it has the acoustic properties. But apart from the practical features, his natural texture complements a relaxing environment that positively affects not only on the

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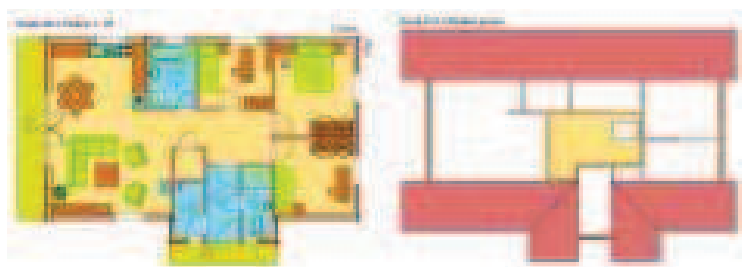
<sup>2</sup> DREVODOM RAJEC : Novinka – cédrové drevo. In: Novinky. Aktuality. [online].2012.[cit. 2012-04-28]. <http://www.zruby.sk/index.php/drevodomy-rajec-sro-mainmenu-65/915-aktualni-nabidka>

residents of that house, but also on its environment. The material is nature friendly and can be easily disassembled and re-processed or decompose. This renewable and sustainable natural resource is a comprehensive building material which has excellent physical - mechanical properties. It is tractable and aesthetic material. Its utility becomes part of the new lifestyle of modern ways of living.

## 2.8 Price

Price is a key factor in choosing any product and it includes the house as well. Price is at the process of building about the same as the classic brick house. But customer can save money especially when time is accelerated during construction process, further wood houses create more space for the same cost, compared to the brick house, but at least the customer saves by the use of wooden house, because it saves on heating. There are therefore several factors that may affect the customer, but the rest will depend on its claims, the size of the project and selected exterior and interior materials. As an example offered by the company Drevotrend, you can see the wooden house type Classic in the provided picture.

Picture 1: Wooden house type Classic



Plan dimensions: 13.41 m x 8.7 m

Building area: 107.9 m<sup>2</sup>

Floor space: 96 m<sup>2</sup>

Price of construction site: € 27,550

Price of wood part: € 42,400

(prices exclusive of VAT)

The source: available on <http://www.drevodomyslovakia.sk/klasik.html>



## Conclusion

The wooden houses are not new to the market. There existed and were offered some time ago. But every trend is indicated by consumer demand. This time, customers focus on environmentally friendly products and health saving products. The wooden houses belongs to this field of products. They are also looking for housing that will perform the function as other kind of housing, but it will bring for them and the environment benefits, but in addition, it will give the opportunity to participate in its visual aspect. Wooden house is a part of requested, and nowadays preferred lifestyle. Its unique features, which uniqueness dates back to the building material makes an ideal product to market, where only different one can survive. The number of architectural variations is creating an extensive menu that appeals to different generations and different types of people. Wooden houses are available in various designs, as well as in various price categories, making them suitable for many target audiences. Even its relaxation character and fabulous appearance attracts the attention of tourists and naturally blend with the surroundings and traditions of Slovakia. Their construction is rather renaissance, it is like return to the visual aspect of the Slovak countryside of the past and return to nature and natural materials, which saves our health and nature.

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# **BUSINESS ANGEL – THE INNOVATIVE FORM OF FINANCING OF TARGET FURNITURE COMPANY AND THE CHANCE FOR THE USAGE OF THE PROFESSIONAL COACHING ALSO**

*Peter Badida*

## **Abstract:**

The article deals with the continuing research of innovative forms of financing in small size furniture companies segment. It describes the situation when the usage the Venture capitals is suitable there and when it is not. Also it describes the barriers of the usage this capital in bigger volume, especially the barriers which stop the cooperation with the business angels. It shows the business angel like the innovative form of financing of the target furniture company and like a chance for the usage of the professional coaching offered and provided by the business angel for its aboriginal owner also. It points that the aboriginal owner's cooperation with the business angel in the target furniture company offers the ideal chance for him to know the other dimensions of the furniture company development in the market.

## **Key words:**

venture capital, private equity, fond of venture capital, pre – seed financing, seed financing, start-up financing, expansion financing, replacement capital financing, business angel

## **1. The Introduction In To Theme – The Problem Definition**

The article describes the results of the continuing research of the innovative form of financing in small and middle size furniture companies for purpose of the business angel topic as the innovative form of target MSP financing and it is the chance to use the professional coaching for its aboriginal owner also. We think, this kind of innovative small and middle sized furniture company financing form can take one of the main role in the restarting the national economics presently situated in global crisis in this branch of industry.

The problematic of business activity financing is still expanding. The businessmen demand for the available finances for the development and adhesion their business activities increase and increase the demand for the access to them. It not enough to have easy access to finance sources in globalized competitive market, it is necessary to know how effectively use these sources.

There are more than 23 million small and middle sized companies in European Union, which are generated almost 57% added value and they create about 90 million local job opportunities. They create more than 99,8% of all companies in that area. They are a centre core of European Union economy and a key part of European industry. They are the main source of business skills and innovations, they contribute to industrial and social cohesion of European countries, they can flexibly adapt their activities portfolio up to the changed market demands. Their ability to create, develop, apply or adapt the new technologies is unique. The strategic interest of small and middle sized companies is recognizable mainly in time of economy amplitudes<sup>5</sup> of the economic processes.

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<sup>5</sup> FETISOVÁ, E.: *Rizikový kapitál – alternatívny zdroj financovania podnikov*. Bratislava: Ekonóm, 2007. ISBN 978-80-2255-2289-2

The small and middle sized companies are often fighting with the financing problems. They create the heterogeneous group of many different characteristics on the other side. Their diversity has different financing needs also and the financing opportunities referring to this<sup>6</sup>.

The requirement of flexible, adequate and efficient finances verifies in some ways the venture capital and private equity.

The venture capital and the private equity as a one of more alternative forms of financing belong to quite new business activities financing way. This capital usually enter the enterprise subject basic capital, which the success of them it carries increased risk from the begging although these investments offer high potential evaluation in case of their success trend.

The venture capital and the private equity is priority connected with redbrick companies financing with high innovative and venture potential, outgoing form the specific knowledge of their owners or key employers<sup>8, 10</sup>. We shift to this group a “Business Angel” capital entering also.

## 2. The Aim and Hypothesis of the Continuing Research

The aim of the continuing research is the finance tools analysis with the concentration to the usage of innovative forms of financing analysis in the small and middle sized furniture companies segment by the venture capital and the private equity. The research concentrate on the characteristics and the definition of all venture capital and private equity system, on the segments analysis, on the relationship and flows description of this system, on research of new evolution trends and on the present usage position of the innovative forms of financing in small and middle sized companies segments in Slovak Republic, in middle and eastern European region and in Great Britain, on the value, structure and profitability of the venture capital and the private equity investments in nominated regions, on the evolution barriers identifications, on the risk comparison and on the advantages and on the model suggestion of the effective innovative forms of financing evolution in comparison with the classic financing methods.

The results of these analyses we plan to use for the comparison venture capital and private equity furniture market analysis in research regions. The part results confirm or disconfirm next tested hypothesis:

1. *“We expect that the value of the venture capital and private equity investments in SVE regions (emerging markets) index more expressive growth in comparison with the western European countries. The biggest share is created by “Buy-out” investments.*
2. *“We expect the relationship between the volume increase of the venture capital and the private equity dynamics and the economy forwardness”.*
3. *“We expect, that the venture capital and the private equity investments value in SVE regions significantly influence the legislation frame and the other regulation rules of the individual states and the small and middle size companies are informedness about this financing form”.*

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<sup>6</sup> FREŇÁKOVÁ, M.: Rizikový a rozvojový kapitál pre váš biznis, ISBN 978-80-89357-06-2

<sup>8</sup> FREŇÁKOVÁ, M.: Ponuka a dopyt na trhu rizikového kapitálu v SR, available at: <http://semafor.euke.sk/zbornik2007/pdf/frenakova.pdf>

<sup>10</sup> METRICK, A.: *Venture capital and the finance of innovation*, Hoboken John Wiley, 2007. ISBN 978-0-470-07428-2

### 3. Business Angel – The Innovative Method of Financing of Target Furniture Company and The Chance for the Usage of the Professional Coaching also

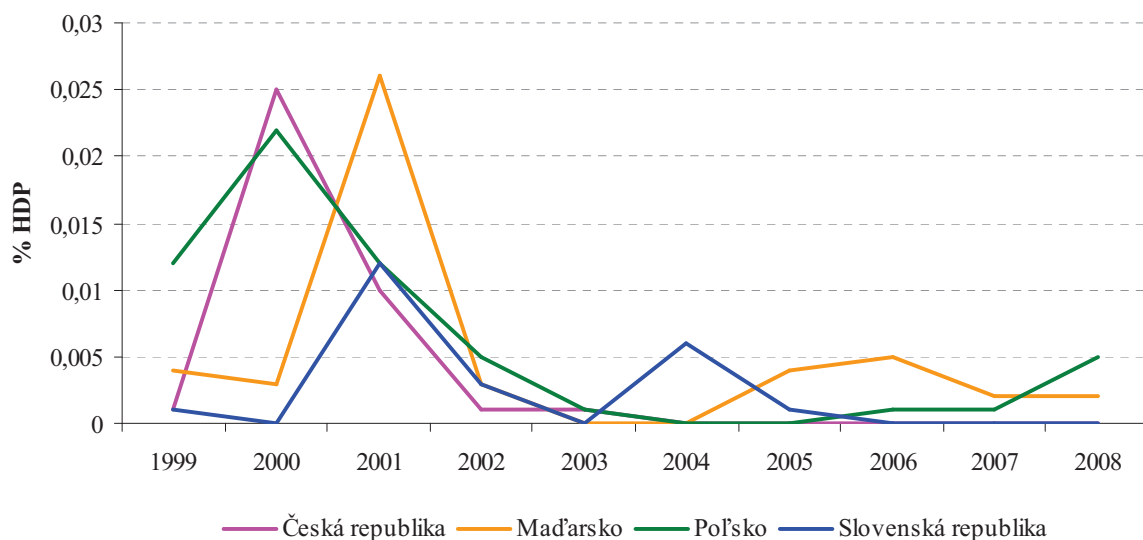
You let me handle with the topic outgoing from the article title in this capture and this is the topic about the business angel capital enter into the target furniture company as the innovative financing form, concretely from the barriers and its owner’s apprehensions before his enter.

“The Business Angels” are usually important personal entities which would like to invest part of their abundant finances in to the new business activities. They are mostly high motivated entrepreneurs with large – scale experiences with their own companies management.

They enter by their capital into the furniture company by the same way like the institutional investors do. They take part in its management and they set its strategy. The strategy pursuance they realize by furniture company business plan pursuance in practice.

The venture capital and the private equity enter, the same way like the business angel capital enter does, it can be realized in its different evolution fazes. The statistics data the share of the country GDP of venture capital and private equity in the MSP’s financing in their individual evolution fazes in V4 conditions, ergo in Slovakia, Poland, Bohemia and in Hungary, illustrates the graph 1.

Graph 1 The share of the country GDP (HDP) of venture capital and private equity preseed and start faze MSP financing (GDP (HDP) v current prices)



Source: The adaptation under the European Innovation Scoreboard 2008 data [12]

After the contracting the agreement between the aboriginal owner of target furniture company and the business angel it become, besides others things, these occasions: The business angel starts his active interest in the target company management by himself and especially by his professional managers team where he is a leader. The aboriginal owner meets his new team and he becomes its inseparable member. The new situation becomes in the company management.

By now, the aboriginal owner managed the target furniture company independently, by his own decisions, eventually by his own manager team and he was limited by the sum of the available company finances to hire them and he was limited by the growth and the

development opportunities which the company can offer to them. We can agree the aboriginal owner's professional growth opportunities and his sum of finances also are not such big like the business angel's dimensions and his opportunities. If it would not be so, the aboriginal owner would not need the cooperation with the business angel.

We can account the business angel like the successful personal entity with the abundant finances who analyzes and considers the capital enter in to the target furniture company and who actively take part in its management to apply made prospectus strategy in practice and he can achieve his optimal investment income.

We can accept that the business angel includes his abundant finances to the joint ventures in to the group of his business activities and he created the managers team for the management of it which it works on the assets management and who is the leader of it also.

The business angel professional team includes top and high qualified traders, marketers, economists, analysts, advocates or scientists, who daily manage the invested assets in several parallel others venture capital investments with one aim – to create and to achieve made target furniture company prospectus strategy in practice in the shortest time and in the widest extension and in the highest effect in comparison to capital investment and with the minimal losses, also.

The leader of this professional team is the business angel. The man with the abilities to motivate and to manage the most experiences professionals in the individual entrepreneur branches who form the high effective system offering with the innovative results, brightly reactive and market changes predictive one also. We can constant that the business angel with these abilities belongs to the superlative managers group.

The aboriginal target furniture company owner who accept the business angel capital enter, he lost the ability to manage this furniture company independently but he becomes a full-value member of the business angel team and he get the opportunity to daily cooperate and to participate in the creating and the fulfilling chosen prospectus strategy together with mentioned professionals. He becomes one of them.

The way how the target furniture company business prospectus is defined before the business angel enter, the same way his aboriginal owner has the vision of its filling and its aims which he would like to achieve in the target furniture company and by it also. By the cooperation with the business angel the aboriginal owner has got the chance to know how the MSP, which its owner he was, it manages presently by superlative leader, by the business angel.

How the getting of the partial aims of business prospectus by many times different, innovative, creative solutions are discussed at the team groups meetings, would even not to found out them by the aboriginal managers team. He takes part in the market information analysis and in the target furniture company strategy creation which it could be unrealistic, too ambitious and especially many times he could not to find them out. He can see and he can take part in the creation of task solutions which he could not see in the aboriginal conditions not even to offer that solutions. The aboriginal target furniture company owner knows and learn the new dimensions of his enterprising he could not imaging them until this moment by these professional business angel's coaches team where he have got the chance to take part in.

#### **4. The Conclusion**

The naming of the new situations where its target furniture company is situated and the finding the innovative solutions out and the creation its aboriginal owner learns and knows, it forms him and improves him forward as far as manager experiences. If the aboriginal target furniture company owner has the capacity to accept these new dimensions of enterprising presented by the professional business angel's team to be his own and to improve

his managers experiences by it, than his partnership with the business angel has got to him more than he could even expect from it, because he did not see them before his capital enter and he could not see them also. The cooperation with the business angel brings him not only his capital evaluation in the target furniture company but it brings him the experiences and the abilities to see the new dimensions of his enterprising and he becomes an expert in his entrepreneur furniture branch.

These new experiences can allow to the aboriginal target furniture company owner better and innovatively manage his furniture business activities in the future independently or in other cooperation with the business angel, too.

And this is one of the positive attributes of the enterprising which use the business angel cooperation as the innovative form of financing.

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# ODOURS EMITTED BY FURNITURE UPHOLSTERY MATERIALS

*Pavel Kindl*

## **Abstract:**

The contribution is interested in problems of volatile organic compounds emitted by materials used in area of upholstery furniture making. There were measured the olfactometric influence of individual components emitted by polyurethane foams and tanned leathers. In the work there is also described the relation among the results reported during the olfactometric measuring and the results reported during the measuring of volatile organic compounds. The results show that compared to other leather substances emit higher concentrations of 1-methoxy 2-propanol. From the point of results we can also say the both types of materials has low level of TVOC (total volatile organic compounds). The properties of odors were tested by the appliance Sniffer 9000. The measured results are compared with the sensory perceptions and results of quantitative and qualitative VOC analysis measured by gas chromatography with mass spectrometer (GS-MS) and gas chromatography with flame ionization detector (FID). Benefit of research lies in measurement of volatile organic compounds which may cause rest and sleep disorders, health problems or even cancer.

## **Key words:**

olfactometry, VOC emissions, tanned leathers, polyurethane foams, perception, odor

## **Introduction**

Environmental protection and protection of human health is becoming increasingly pursued issue of the society. In the environment acting on the human organism can be distinguish three basic areas that are polluted and humans are adversely affected. Next to pollution of land to produce plant and animal component of human food, and pollution of water that people consume not only directly, but is used to irrigate land for crop production and supply of domestic animals in livestock production, it is absolutely most important factor in air pollution. With two first appointed human factors human organism comes into contact, either indirectly or directly, although every day, but not continuously, as the latter mentioned one. Quality of drinking water as well as quality of food is constantly monitored nowadays and therefore may be unsafe food and drinking water to detect and remove from the market before it reaches the final consumer and cause health problems. The air pollution situation is considerably more complicated. Air quality is indeed observed, but a network of measuring stations are located mostly in larger cities and there to monitor only certain components of airborne pollution. The measuring stations are not able to detect smaller local sources of pollution which may endanger human health and the worse case human life. Air pollution acts on the human body directly and continuously from birth until the end of life. This aspect puts air protection on the first place in the area of environmental protection.

Nature has equipped the human perception around the five senses: sight, hearing, touch, taste and smell. Smell and taste are functionally closely linked together. These two senses enable man to recognize chemicals. While taste is primarily used for recognizing chemicals accepted by human body in the form of food in solid and liquid state that means by contact sense of smell is used for recognition of chemicals at low concentrations of odors in

the form of distance detection primarily airborne substances. Smell is an indicator for humans polluted air of danger and by extension, life-threatening.

World Health Organization (WHO) defines health as a state of general well-being that is both physical and mental, and social. If a person perceives odors and thus leads to disruption of general well-being, according to this definition can be talk about its health deterioration.

## **Aim of the project**

The aim is to analyze and evaluate the quality and quantity of emissions of volatile organic compounds (VOCs) emitted into the indoor environment from the materials used in the manufacture of seating and lying furniture and furniture finishing leather sheathing materials. Establishing mutual dependence between the concentration of TVOC and the amount of odor substances. Continue to monitor the intensity of odor, odor character and hedonic tone of odor perception emissions. In conclusion, analyze the relations between the results obtained by measuring and analyzing VOC emissions by gas chromatography and olfactory assessment and also there are considered potential impacts of identified compounds effects on human health. The average human spends 80-95% of their time indoors in different buildings "at home 62%, 25% at work or at school, administrative and special purpose buildings and approximately 8% of their time is spent in transport vehicles<sup>1</sup>.

## **Material and methodics**

For the measurement of material samples are used dimensionally adjusted samples for measurements in small space chamber dimension 1m<sup>2</sup>. The small space chamber VOC-TEST 1000 is sampled by a pump into the sampling tube with sorbent. There were measured the olfactometric influence of individual components emitted by polyurethane foams and tanned leathers.

Sample of emissions is obtained from the measuring chamber via the air pump at constant sampling air flow to a metal desorption tube, where VOC substances bind to the sorbent Tenax TA. The content of the tube is analyzed by gas chromatography with mass spectrometry (GC-MS) and thermal desorption (TD). For olfactometry assessment are used gas chromatograph with flame ionization detector (FID) and device Sniffer 9000 (GC-O). Then CHEM STATION software assess quality and quantity of the emissions analyzed samples and record data in electronic form.

To determine the TVOC (total volatile organic compounds) in the chromatogram of the sample is evaluated cumulative area of all peaks between retention time of hexane and hexadecane. To evaluate the amount using the calibration curve.

Assessors provide hedonic tone of substances that are submitted in time intervals through Sniffer 9000th Assessors determine the hedonic tone by the recording device with a scale. The result is olfactogram. Overlapping olfactogram and chromatogram can identify and evaluate the measured substances.

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<sup>1</sup> Urbanovska, Popovicova 1988

## Results

Tab. 1 Olfactometric determination of the measured substances of PUR foams

			hedonic tone and odor intensity	
No.	Retention time	Compound	Rate	Indication
1	4,0	pentanal	-1	rather disliked
2	6,0	toluen	+1	rather liked
3	6,7	hexanal	-3	hated
4	7,4	butyl acetat	+1	rather liked
5	8,5	ethylbenzen	-1	rather disliked
6	9,2	m,p-xylen	-3	hated
7	10,3	butoxy-ethanol	-2	could interfere
8	11,2	$\alpha$ -pinen	-1	rather disliked
9	12,0	$\beta$ -pinen	-3	hated
10	12,7	2-Ethyl-toluen	+2	might like
11	13,1	$\alpha$ -phelandren	+1	rather liked
12	14,5	Not identified	-2	could interfere
13	14,9	Not identified	-4	unpleasant
14	16,4	Not identified	-2	could interfere
15	17,6	Not identified	-2	could interfere

Tab. 2 Olfactometric determination of the measured substances of tanned leathers

			hedonic tone and odor intensity	
No.	Retention time	Compound	Rate	Indication
1	2,4	1-methoxy 2-propanol	-3	hated
2	3,0	toluen	+2	might like
3	6,3	hexanal	-1	rather disliked
4	7,5	butyl acetat	+1	rather liked
5	8,5	ethylbenzen	+1	rather liked
6	9,2	m,p-xylen	-1	rather disliked
7	9,5	o-xylen butoxy-ethanol	-2	could interfere
8	9,9	butoxyethanol	+3	liked
9	11,7	$\beta$ -pinen	-2	could interfere
10	12,7	2-Ethyl-toluen	+2	might like
11	13,2	$\alpha$ -phelandren	-1	rather disliked

12	14,6	Not identified	-3	hated
13	14,7	Not identified	-4	unpleasant
14	16,4	Not identified	-2	could interfere

## Conclusion

The aim of this work was to measure out emissions of VOC and calculate TVOC and olfactometric assess. The emission of VOC emitted by the tested samples of material 1 m<sup>2</sup> meet the limit concentration established Ministry of Health Decree No. 6 of 16 December 2002 laying down the health limits for chemical, physical and biological indicators for indoor residential rooms. From the point of results we can also say the both types of materials has low level of TVOC (total volatile organic compounds). When comparing the results with the Eco-label set by the European Commission, Commission Decision 2009/598/EC (Bed mattresses) for the foam used to manufacture mattresses were no unsatisfactory banned substances releasing aromatic amines. As well as measured values did not exceed the VOC limits specified in this document for these substances.

The results show that compared to other leather substances emit higher concentrations of 1-methoxy 2-propanol. This substance probably gets into the leather in the process of the softening. 1-methoxy 2-propanol is a colorless liquid. Flash point near 89°F. Less dense than water. Contact irritates skin, eyes and mucous membranes. Prolonged exposure to vapors may cause coughing, shortness of breath, dizziness and intoxication, exposure to liquid is irritating to skin and eyes.. Vapors heavier than air. Used as a solvent and as an antifreeze agent also is highly flammable<sup>2</sup>. Amount of emissions of this substance is not regulated but can cause problems particularly to sensitive individuals.

Benefit of research lies in measurement of volatile organic compounds which may cause rest and sleep disorders, health problems or even cancer. The following part of the research will deal with the influence of temperature and time on the amount of VOC emitted.

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# THE IMPACT ON PERSONNEL MARKETING COMPANIES IN THE WOODWORKING INDUSTRY

*Ivona Kintlerová*

## **Abstract:**

The author in her contribution deals with the influence of personnel marketing in companies involved in wood processing industry, because the timber industry was the first industry in Slovakia which felt the impact of economic crisis and especially the decreasing demand in the construction business. Economic collapse immediately reflected to the increase of unemployment. That's why the communication with customers became an important part as well as motivation of employees and receiving high-quality system solutions.

## **Key words:**

timber industry, personnel marketing, unemployment, employee, motivation

## **Introduction**

There are several industries with a long tradition in Slovak republic. The wood processing industry felt the impact of the global economic crisis significantly especially for falling demand in the construction business. This fact led to closing of several smaller factories. Economic collapse immediately reflected to the increase of unemployment. That's why the communication with customers became an important part as well as motivation of employees and receiving high-quality system solutions.

### **1 Timber industry**

The wood processing industry belongs to category of middle industry. This industry represents about 10% share in total sales of industry in Slovakia. Currently 41%<sup>1</sup> of Slovak territory is covered by forests which represent stock or reserves over 396 million. m<sup>3</sup>. The main activities of wood processing industry related to the main raw material which is wood. Its rich sources are used mainly in the mountain regions of Slovakia. Businesses in this sector are small and middle companies which are almost entirely privately owned. This very various economic sector includes sawmilling industry, construction or building industry, furniture industry, manufacturing of packaging materials, plywood, matches, paper and pulp.<sup>2</sup> The best-performing sector in the Slovak economy is just pulp and paper industry. Due to the global economic crisis revenues fell by in average 13% per year (export fell by around 15% per year). The biggest integrated pulp and paper factory in the Slovak Republic is Mondi SCP in Ružomberok.

The wood processing industry in Slovakia is one of the industry sector which strongly felt the impact of the global economic crisis. According to some economists the financial and economic crisis should last until December 2009 but it didn't happen. To find the way out of the crisis<sup>3</sup> is more important than to mark the culprit of the crisis. This

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<sup>1</sup> <http://slovensko.infoweby.sk/priemysel-energetika/drevospracujuci>. (2012-04-22)

<sup>2</sup> <http://www.advantageaustria.org/international/zentral/business-guide-oesterreich/importieren-aus-oesterreich/branchen/holz-und-papier/ueberblick.sk.html>. (2012-04-22)

<sup>3</sup> KONOPKA, J. - KOVALČÍK, M. - MORAVČÍK, M.: Krízový manažment v lesnom hospodárstve. Zvolen:



is a global crisis and it is obligation and responsibility of all states and their communities to find solutions. The end of the crisis in the wood processing industry depends on renovation of the EU markets. The negative sign is the discrepancy between wages and productivity.<sup>4</sup>

## 2 Personnel marketing in wood processing companies

There is only a few furniture producers in Slovakia at the present day. Plenty of wood shows that Slovakia has the potential to become a furniture power.<sup>5</sup> The Slovak furniture is on its growing potential. The most significant investment in the Slovak furniture sector made The Swedwood company which bought Trnava furniture factories in the mid of 90's. The Swedwood company is an international industrial group founded in 1991 by IKEA focused on the production and distribution of wooden furniture. Swedwood Group has got approximately 50 production units and offices in 10 countries on the three continents. This group employs approximately 16.500 employees. The Swedwood Slovakia creates 4 concerns (Trnava, Jasná, Malalcky, Majcichov) which employ nearly 1700 workers and production creates almost half of all Slovak furniture. This company did not remain untouched by the crisis and situation led to dismissal of employees. The first redundancies was in 2009 and next one at the end of 2011. Unemployment is a complex of multilevel relationships and its effect is not limited to a employee,<sup>6</sup> employer or employment offices only but also to private and family life of the unemployed person.

The Swedwood company is the biggest Slovak employer in furniture industry and we can show on this example how the personnel marketing works in wood processing companies. People are the basic value of Swedwood Slovakia company. Employees are admitted to a company according to employment contract for a permanent job. Employer creates work conditions according to labour law as well as in terms of its internal regulations. He is responsible to arrange a pleasant working environment, protection and work safety and provide personal work-protective equipment to all employees.

Motivation of employees in reward system consists of financial rewards, bonuses or through attendance bonus which is paid to any employee who didn't miss any work shift in working month. This bonus is very motivating. The employees lose this bonus if they miss a work shift (for example if they are ill or have to take care of family member, if they take a holiday) and it has got opposite or reverse effect. Often employee inability to work led to this decision and implementation of theses bonuses had positive effect. If employees are sick more than 100 days, the employer pay them financial support which cover the loss of earnings due to illness. According to the labour law the colleagues<sup>7</sup> have the right to organize and join the trade union supported by company. The above mentioned idea for covering the losses of earnings was created by this union.

Further support for workers is a positive social development which means for the Swedwood company a major area focused on employees. Positives consist mainly in care for

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Národné lesnícke centrum. 2010, p. 5. ISBN 978-80-8093-109-4.

<sup>4</sup>GREPEL, E. - PALUŠ, H. - CHUDOVSKÝ, D. - ŠULEK, R.: *Zhodnotenie drevnej hmoty a marketingové riadenie*, Zvolen: Národné lesnícke centrum. 2009, p. 146. ISBN 978-80-8093-094-3.

<sup>5</sup>[http://www.sario.sk/userfiles/file/sario/pzi/sektorove/wood/woodprocessing\\_sk.pdf](http://www.sario.sk/userfiles/file/sario/pzi/sektorove/wood/woodprocessing_sk.pdf), p. 11-12. (2012-04-22)

<sup>6</sup>ŠVEC, M. - MADLEŇÁK, A.: *Kriminologické aspekty pracovného práva: nezamestnanosť vs. kriminalita*. In: *Teoretické úvahy o práve 6*. Trnava: Trnavská univerzita v Trnave, Právnická fakulta. 2010, 17 s. ISBN 978-80-8082-409-9.

<sup>7</sup><http://www.swedwood.com/about-swedwood/>. (2012-04-18)

employees and their children, food allowance, organize sports and recreational activities but also adaptability of workers. Adaptation is required in newly hired employees who receive their mentor to oversee the integration into the corporate culture. The Swedwood company has ambitious plans for the future and will need more people in all areas of competence. There is a lot of work necessary to focus on increasing of productivity of the production units by development of technical equipment to increase work productivity.

Mondi SCP company is another example one of the biggest industrial entity as well as the biggest employer in region. Company produces offset paper, wood pulpe, woodfree paper, printed wrapping paper<sup>8</sup> and wooden palletts. It is a producer of the electrical energy and company adjusts waste water for a town Ružomberok. Mondi SPC company carries out many social activities to achieve satisfaction of employees as well as other stakeholders. It makes a big investments in technology to achieve not only higher but environmentally acceptable production. Mondi SCP company has clear aims and all activities lead to their fulfillment. These activities are carried out under the strategy of sustainable development. Company aims to develop and strengthen the people's best performance by a specialist in human resources, providing advice and management support. The success of the company consists of skilled and educated workforce which is able to carry out work safely and productively and in this way to fulfill its potential. They are seeking fundamental rights under the Convention of the International Labour Organisation (ILO) to ensure fair conditions for the employment of all staff (for example in remuneration, the prohibition of discrimination based on race, sex, age).

The current situation in the company is perhaps due to the crisis a little bit different. Dismissed employees describe the situation in the company unflattering. Management began dismiss the employees when crisis came. The reduction of employees affected mainly permanent employees because management gave them the choice either they will be dismissed, or they will work on trade (self\_employment) as contractors. A lot of employees chose self\_employment because they worried that they will lose a job. Total number of employees decreased and the work has shifted from two employees to one employee but the salary stayed the same. Motivation of employees is very low. The main reason is that management began to use outsource staff and together with it began work in a company so called "Children management". It means that companies began to hire young people who can speak English but have no work experiences. The professionals who worked in the company 10-15 years were dismissed from work because they had the language barrier and they did not speak English. Management in the current situation benefits from the fact that it is a weaker work region and therefore they can afford fluctuation or job changing.

Positive thing is that the company still considers as the most important area the area of training and staff development. The company provides to their employees and their families scholarships and other forms of financial support for higher education, training and various training courses and seminars for knowledge support. Staff development is an area where management develops a safety and health protection at work. Management affords better care of employees through the trainings and seminars focused on safety, risk prevention on the workplace, as well as carrying out audits leading to subsequent correction

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<sup>8</sup> <http://www.mondigroup.com/sk/desktopdefault.aspx/tabid-511>. (2012-04-19)

of deficiencies. All these steps are provide in order to reduce and eliminate harmful effects at work.

The wood processing industry employs more than one million people in European union. Next 500 millions are customers who speak 23 official languages. Language differences are advantages and disadvantages for the future of European union and prosperity of its people. Language is a foundation of cultural heritage on the other hand the costs for translation and interpretation in an environment where multilingualism is not ensured are too high. Two-year international project of the EU (2009 - 2011) called Technical English was created for the woodworking industry (in short VETWOOD). This teaching material they tested on high school students, college students and professionals with woodworking experiences. The blended learning was included into this project. It is a combination of classical learning and e-learning with the use of interactive multimedia training materials for teaching technical English language and learning of the woodworking terminology.<sup>9</sup> The benefit of this project was an attempt to remove language barriers and help increase the competitiveness of timber companies. Other companies which solve the problem of the language barrier everyday should start to use EU funds and money in the future too.

The language barrier is not one and only problem which is necessary to solve for the future. The current situation on vocational schools shows that these schools finish less professionals or experts who are focused on crafting, whether they are carpenters, cabinetmakers or construction workers.<sup>10</sup> Vocational schools focus on crafts in the construction and woodworking industry release annually from its gates a minimum of finished craftsmen who are able to make this job. The labour market needs a lot of these specialists. We have to ask question: How can we return the craftsmanship among young people? We must realize that today's young people want to earn money when they finished school. They want to earn a lot of money with minimal effort and they prefer jobs where they "stay clean". Young people as well as employees working in the industry discourage to work in this sector mainly obsolete technology and low level of remuneration. The only possible solution to increase the number of people who are willing to learn and are able to work in this industry is to promote innovation, subsidies from the state, inflow of foreign investments, creativity of education and motivation of all potential employees.

## Conclusion

The significant increase in export of final products of the wood processing industry at the expense of exports of raw material, increased sale of domestic wooden products on the domestic market, better use of surplus raw wood assortments, creating of the new jobs and building of the stable business relations between producers and processors of raw wood are the main activities in Slovakia. Modern technologies, support of innovation, innovative business, creativity, education, building research and development centers, laboratories and testing are currently the most important areas of progress across the country.

Support of foreign investment, communication with customers, motivation of employees and receiving of high-quality system solutions belongs to one of the main tools of innovation in the industry and increasing of the attractiveness of Slovakia.

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<sup>9</sup> Stolársky magazín, 11. year, no. 5/2010, p. 33. ISSN 1335-7018.

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# THE IMPORTANCE OF PHOTOS IN PROMOTIONAL MATERIALS THE FURNITURE INDUSTRY

*Ivan Kopčáni*

## **Abstract:**

The author deals with the importance of work in photography in the promotional and advertising materials. Points to the target of marketing communications, the company's visibility in the market and consumer information about its products and services. Promotion is an important means whereby the firm points to the positive side of his business and helps to raise the confidence of consumers. Photograph in promotional materials, it helps. In different parts of the author clarifies the promotion as a concept. Describes the tools, such as advertising, public relations and sales promotion. Explains the importance of marketing communications and its role in the activities of the company. Clarifies the principles and features of advertising, its species and the impact on the consumer. In the next part was to draw attention to the importance of promotion in the company's activities.

## **Key words:**

promotion, advertising, public relations, promotional materials, products, services, customers, products, photos, promotional activity

## **1 Introduction**

The main theme of the contribution is the analysis of the communications mix, and use one of the tools – photography in practice. From a theoretical point communication mix part of the marketing mix. Through an optimal combination of individual components of the communications mix, the company aims to achieve your marketing objectives of the corporate total i.

Any company that wants to keep the market must expend considerable effort that attracted the attention of the customer. Taking into account the present much competition it's difficult. In this intention to its promotion and related activities just helps. This theme took me in particular because the advertising currently has an important place in the daily life and provides sufficient space for the application of creative thinking.

## **2 Marketing mix**

"Consider each element of the marketing mix and evaluate what has meaning for you"

### **2.1 The importance and the objectives of the marketing mix**

Marketing mix is generally known as the four "P": product, price, place and promotion. Means the development of an appropriate product (such that meets the needs of customers), the determination of an adequate price for product (such that it will bring profit and maintain customer satisfaction), fair distribution, hence its location to the appropriate place (where the customer can buy it) and promote (to encourage customers to get product purchased). Component of the marketing mix are the same for all organizations. Business company differ from quantity of individual components.

### 2.1.1 Examination of the proportions

When you are working out an appropriate marketing mix, you maximize your profit. Focus on each component and consider its relevance to your business. Remember, the marketing mix is not a static entity. Today's perfect proportions might not bring about the desired results of the year, or even already on the week. From time to time you will need to alter the quantitative representation of components. For example, reduce the price situation will force you during the "dead" season. Between the four components of the marketing mix, there is the internal relationship. If the price is high, customers will have great expectations. If you have a lot invested in advertising, the cost will have to be reflected in the price.

### 2.1.2 Innovation

The growing requirement of competitiveness constantly to increase the pace of its manufacturing business makes. Progressive removal of various customs freight transport market through global economic or legal barriers, the need for immediate adaptation to changed conditions arises in companies, which are characterised by a particularly fast for business innovation trends. Whereas, the life cycle of most products on the market, it is necessary to ensure the supply of new ideas and shortens the solutions of problems in order to meet the requirements of the customer in the shortest possible time, with the assistance of partner entities from the external environment. Open innovation are the source of opportunities for the application of the knowledge, talent, creativity, so individuals and groups wishing to actively build on your knowledge of potential market.

## 3 Communication mix

Marketing communications mix is a component of the marketing mix. Through it, the company seeks to achieve the objectives of the corporate marketing and optimizing the different instruments. For the area of services is essential, therefore, that in most cases, approximates the intangible product to the consumer and thus reduces the uncertainty in the selection and purchase of services. Professional, ethical and regulatory restrictions and conditions on the market, when the existence of natural monopolies in the service or the local demand for services, management often conducts cant to believe that they might not seek to maintain their organization and products in the mind of customers. For the success of the communication mix appropriate choice of tools is of great importance and the assessment of their exposure to the target group.

### 3.1 Communication tools

Through the selected communication mix tools company has, or even to convince customers, including the potential, by notifying them that information. This movement can be direct, then it is a personal communication. Communications can be addressed as many non-targeted beneficiaries, then talk about impersonal communications or De Pelsmacker uses the concept of mass communication. From this point of view, to assign a personal communication from the communication mix tools, and personal selling. Other of its constituents, namely advertising, sales promotion, public relations and direct marketing, among the forms of impersonal communication. It should be noted that in theory there are also other classification tools, depending on the specialization of the author.

Despite the differences between services and consumer goods, to services and sale of consumer goods much in common. Firms operating in these markets, according to theoretical



assumptions, usually more of their budgets devoted to advertising, followed by sales promotion, personal selling and public relations. A different approach is expected in the market of industrial goods, which occupies a dominant position, followed by personal selling and sales promotion before advertising and public relations.

### 3.2 Advertising

The general characteristics can be used Kotler definition. "Advertising is defined as a form of paid nepersonálnej presentation and promotion of ideas, goods or services paid by an identifiable sponsor." De Pelsmacker extends this definition and argues that it is a "paid impersonal communication companies, nonprofit organizations and individuals who are identifiable in some way in the advertising and notice who want to inform or persuade a person belonging to a specific part of the public through the media."

With these definitions can be accepted unconditionally, and I add that advertising is a tool widely used regardless of whether it supports the product, service or idea. Particular attention should be paid to the issues of setting targets advertising, selection of appropriate media and methods of budgeting.

### 3.3 The objectives and forms of advertising

In general, we aim to define advertising as a communication task to be fulfilled in relation to defined target audiences over a period of time.

The objectives of advertising and the resulting forms can be classified according to several criteria. Kotler criterion selects the product lifecycle. Targets are distinguished by a focus on informing, persuading, comparing commemoration respectively. Hesková chosen as a criterion for building advertising. Distinguishes between product advertising, institutional, corporate or social promotion. Type of notice as the criterion used by De Pelsmacker and extends the types of advertising division of the transformation, and action themed advertising. In the literature we can find and classify targets and other forms of advertising. The joint should have but that are set realistic, clear and measurable. They quantify the results that the company wants to achieve.

From this point of view will bring more goals under measurability Payne lined up:

- Area audiences defined target group members who have exposure to media exposure, regardless of whether they actually saw the ad or not.
- Awareness and attitudes within which examines whether the target audience actually sees an ad, for example, actually reads the advertisement, and to what extent was reinforced by a positive approach to the advertised product.
- The resulting finds desirable behavior, the impact advertising has on the audience and the extent to which affected the buying decision.

Based on the extent to which the objectives were achieved, we can talk about the effectiveness of advertising.

### 3.4 Advertising and promotion now

Promotional activities such as advertising and direct mail advertising to inform customers about your offer and convince them to choose from it. Promotional activities for most companies is fundamental to attracting the attention of customers. Advertising is less important for the temporary store. Suitable point of sale and product guarantee success.

Under advertising can understand the way in which I try to own the product produced to inform as many people. Competition among manufacturers is so strong that the future of the company is very sensitive to whether the consumer in this great diverse selection of products range just after our product. And because the consumer knows the actual quality of all products and are not always able to distinguish their own merits, so often leaves influence the advertising better arguments. Creation of advertising, we distinguish two aspects. On the one hand to the business of literary texts in the most varied applications, on the other hand, is a work of art consisting of graphics and photos. Promotional text should be interpreted in a way that is most widely understood by the customers. Ongoing efforts is the desire for new modes of expression, the culture of verbal and verbal submissions, the administration of the best content. Promotional text has its regularity in form and content. Its content must be based on intimate knowledge of the goods or services offered, the customer account, the truth of all statements and information in the text and original idea, which would not only create the content of the text, but which also brought something new and interesting and thus increase interest of his reading. Texts can not be libelous, defamatory, may not be challenged competitor. The role of advertising is to highlight the weaknesses of others but to highlight our strengths. Advertising should be created just such a way that the comparison was left to the customer and also a way to make a decision just for our company. Text will be different for brochure or poster for radio or television. The spare time is a means of advertising, the level and composition of the ad can be interesting and engaging, and thus advertising is in the mass media means more expensive (news - text ads, mostly verbal, option file; TV - text + music + speech + animation - multimedia advertising - attracting a lot more and leave a long lasting impression).

#### 4 **Picture and photo**

For clients and customers is a photo image of an impressive new way to gather information about products and services. They make the information more visual and plastickejšie. At the reception, as with other graphic elements based on the basic psycho - physiological patterns of human perception. Word and image are perceived as signals representing real events. Arguments of the image is often more effective than persuading the written word. Photographic image you can see the whole in an instant - recipient perceives the displayed information directly and immediately. Photo of us just evokes feelings and emotions, but also mediates their interpretation of thought. Photography also provides an intuitive and factual information given s display important features of reality. In addition, very clearly demonstrate and express mental states, emotions and feelings such as joy, pain and tension and so on.

Clarity of picture is also relative. Recipient sees the basic fact, understands it, but needs additional information to refine and complete the picture. Because the photo in its primary form is active not only in city but mainly on the rational side recipientovej personality requires a proper understanding of the accompanying text always appropriate or suitable location in the text. Photography is not just strengths but also weaknesses that need to be aware that it can be better utilized.

Graphic design is printed on promotional material indispensable function. The application of graphics to create a total "face" of promotional material should always have in mind the primary function of graphics - and to create favorable conditions for the reception offered by content and not least the aesthetic experience offered to the client.

## 4.1 **Painting and photography in advertising**

No graphics are virtually not do any promotional material. It is an important part of posters, leaflets, banners, packaging, advertisements, cartoons, advertising lighting, dressing aids, exhibition panels and the like. Art gives form promotional means expression, it must be clear. Do not promote graphic excesses, disputes or violence. Most customers are ordinary people. This should be close and understandable graphics. Graphics with text, the idea must harmonize with each other and relate. Photography is based on the content of advertising and promotional plan. It should be convincing, based on the mastery of the goods and the appropriate image filing excludes any doubt. It must be clear, truthful, creative, technically perfect. An important part of advertising is the name - stamp word. It is more than certain that the named product is better to talk and write. Characteristics of the name of the product differentiation is easy, concise, clear and good pronunciation, bezinterpunkčnost' (no commas), should not mean anything derogatory, dvojmyselné, offensive. I graphic sign must be as simple as possible, universally usable (usable in print, suitable for the design of metal sewn into the fabric, can be used in neon, on the packaging), promotion of effective and easy to remember.

Currently, there are a number of options, such as make our advertising products - goods, services, ideas. The purpose and mission of the newsletter is to inform consumers in general, attract attention and interest in the condition advertised product. The prospectus is more comprehensive than leaflet informs in detail about the product and comprehensive manner. The best way is to use a poster of daily or frequent needs for goods brand, or as part of promotions. The poster is a graphical shortcut with uncomplicated drawings.

A short video, but is mainly text and banner stands, located in a visible and busy place. Advertising in the global scale is one of the most common means. It has great persuasive ability. Advertisements are usually placed in daily newspapers, weeklies, journals, occasional papers. Text AD requires brevity and concentration at the same time, the words must be properly funded and sensual. For advertising on television, radio, in cinemas and on videodiskotékach most suitable products for large customers, and each layer is readily available. It is a multimedia advertising - linking text, graphics, sound and animation. Other promotional materials: catalogs and price lists, labels, calendars, business cards, pens, rulers, coasters, napkins, receipts, promotional gifts, advertising on the walls of houses, shops for blinds, a video wall.

## 4.2 **Photo of promotions - visual evidence**

The image is perceived rather than text, has the opportunity to attract attention. Photo of promotions serve as an effective emotional appeal, but can also be used explicitly as a rational appeal in terms of accurate representation of the product's use. Photography is more effective and usable today as an illustration.

In the beginning was absolutely trustworthy copy of reality, it is no longer true 99% of the footage is edited and arranged (PC), but we all love to let it lie. Very effective is the use of photography as a unifying element to link the TV spot, a billboard advertisement or other printed prop. means the comprehensive campaign. Important is the story, model, lighting, viewing angle, composition, use of technical aids (for shooting and post-treatment), for example. fisheye, color filter, ...

The advertising and art photography Someone said that advertising is now hanging in art galleries and see the advertising page. It is a very mixed and many art photographers living on advertising. Only a few advertising photographer was lucky enough to have formed the subject matter itself. That, as you know, comes from the creatives at the agency heads, broken

down in detail or even one layout. The Art Directors shall be consulted until the final snap. The photographer is thus only a tool, but it should be a professional to investment in the campaign behind it and the photo showed schoolgirl errors.

Advertising, product photography is to be effective and straightforward in order to reach the client. Without many additions kitschy addressing immediately. Photo has a product to sell, so lighting is very important, without disturbing elements. Very important is communication between the client and photographer. Promotional photos of products, people, resorts, hotels and services can help a successful business, where 99% of clients looking over the internet and decided on the basis of quality photos. Photographer exactly with the 'client' instructions' in order to meet its requirements.

In the case of the granting of freedom selected photographer brings a creative approach to all the promotional work, and often surprised his client innovative images. The 'right' image sells products and the creation of such an image is part of the 'art of image'. Ideal example photograph propagation campaign is the idea of forming Luciano Benetton (if you feel that that which is prepared píše as fiery, describe some of his campaign: eg. Ženský ass in jeans Jesus "who loves me, he has followed" what was about to shoot "fresh" baby, or dying of AIDS ... see. question of history LB)

## 5 Evaluation

The aim of this thesis is to show that the painting - photography has the opportunity to attract attention. The base lies in promoting the sale of the product, but draw attention to the product. In the production of promotional materials and communicator are increasingly using modern language, which is graphics - so use the image. Two-thirds of the knowledge one obtains a visual way. The correct and effective use may attract our attention, or vice versa, turn the opposite direction. In many cases, graphic design and aesthetic experience affects the overall image and promotional materials.

Even advertising can not change the unpopular popular product, to facilitate the sale of goods that people want, or to impose nemódny goods because people can ignore the ads. Since advertising works publicly, anyone can, within its capabilities to assess its content and form. It can accept it or reject it.

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# INCREASING THE COMPETITIVE ADVANTAGE BY INVESTING INTO ENERGY EFFICIENT WOOD PROCESSING AND FURNITURE MANUFACTURE TECHNOLOGIES

*Ivana Perić – Renata Ojurović – Tomislav Grladinović –  
Kristina Bičanić – Krešimir Greger*

## **Abstract:**

The aims of the European Union policy on energy are: to ensure the functioning of the energy market, to ensure the security of energy supply in the Union, to promote energy efficiency energy saving and the development of new and renewable forms of energy, and to promote the interconnection of energy networks. Energy efficiency measures implemented in the industry consist of improved power management, optimization of existing processes and implementation of new technology and facilities for simultaneous production of electricity and thermal (heat) energy. Total energy consumption almost always increases with increasing economic development, to support energy, especially in energy-intensive industries. The joining of the environmental standards products and highly energy efficient – production technology are important elements of non-price competitiveness. In this paper based on 548 investment projects from 2007 to the 2010 has been done the analysis of the amount of investments for wood processing and furniture production companies in Republic of Croatia has been analysed. The analysis shows noticeable positive rising trend of investment projects through the period.

## **Key words:**

production, wood processing, furniture, technology

## **1. Introduction**

Wood processing and furniture manufacture in the Republic of Croatia is developed on high quality forest resources. Its activity, based on the use of forest raw material and many years of tradition, represents an important segment of Croatian economy<sup>1</sup>. According to Ojurović<sup>2</sup>, sustainable development in wood processing and furniture manufacture is defined as a science and activity that comprises a set of coordinated, comprehensive and controlled actions. These actions ensure a synergy of economic and ecological goals which fully respond to the demands of the environment protection movement and the ever-increasing market demands for “green” products and services. Their function is to improve the human space and developmental resources and at the same time provide the highest possible difference between positive effects (external economy) and negative external effects (external diseconomy), primarily through a more efficient and effective use of the existing or alternative infrastructural and suprastructural contents and the development of factors of reverse logistics. In doing so, total costs of the logistic system are reduced, raw materials from

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<sup>1</sup> Pric, A., 2011: Utjecaj inovativnosti na konkurentnost tvrtki u industriju namještaja, Doktorska dizertacija, Sveučilište u Zagrebu, Šumarski Fakultet, Zagreb.

<sup>2</sup> Ojurović, R., 2010: Model investicijskih ulaganja proizvodnih subjekata Prerade drva i proizvodnje namještaja Republike Hrvatske u funkciji održivog razvoja, Doktorska dizertacija, Sveučilište u Zagrebu, Šumarski Fakultet, Zagreb.



unsustainable sources are substituted with ecological resources and raw materials, and materials used in the production process are reused, renewed, collected and recycled.

Energy efficiency is one of the most important factors related to investments into new technologies and the effects of these technologies on the environment. Energy efficiency is the sum of planned and implemented measures aimed at using minimal quantities of energy needed to maintain the comfort level and production rate. Efficient energy use entails the application of energy efficient materials, devices, systems and technologies currently available on the market. The overall goal is to achieve the same effects with reduced energy use (heating, cooling, lightning, cooking, laundering, etc.).

According to Ojurović<sup>2</sup> one of the key factors that justify investments are new, energy efficient technologies. When technology is perceived as a competitive factor, it can be associated with the possibility of creating and using new technologies. Current production conditions require the broad application of automated technologies in the process of designing, planning and production. In order for a technology to be successfully integrated in a business process and to keep up with global trends, systematic investment in technological development is a necessity<sup>3</sup>.

This study analyzes the amount of investments into energy efficient technologies by wood processing and furniture manufacture companies in the Republic of Croatia. The analysis was based on 548 investment projects in the period from 2007 to 2010. A positive growth trend was recorded for the observed period.

## **2. Materials and methods**

Wood processing, wood and cork products manufacture and furniture manufacture are traditional economic branches in the Republic of Croatia, predominantly in rural areas. They play an important economic role in the overall processing industry of the country. Studying the impact of investment activities of associated economic subjects on the performance of business effects provides an important guideline for planning and realisation of future development concepts. These concepts follow modern trends of industrial development and are stimulated by suitable measures of industry policies and by support of competent institutions.

Research results were based on primary data on investments by economic subjects into energy efficient technologies. Research included a total of 548 investment projects, whose results were systematically collected over a period from 2007 to 2010. The conclusions are given in Table 1.

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<sup>3</sup> Kesner- Škrber, M., Mikić, M. 2003: Državne potpore u Europskoj uniji i Hrvatskoj, u: K. Ott (ed.), Pridruživanje Hrvatske Europskoj uniji: izazovi ekonomske i pravne prilagodbe: 107-131.

Table 1 Number of investments per year over a period from 2007 to 2020<sup>4</sup>

<b>YEAR</b>	<b>INVESTMENTS</b>	
2007	141	
2008	142	
2009	128	
2010	137	
	Total	548

If we classify investments by subcategories, the largest number (309) belongs to the FP category (primary product). This is logical in view of the need for systematic and diverse investments into the production structure of a higher finalisation degree, but also testifies to limited investments into the PF subcategories (semi-final products). The ratio in favour of PF (semi-final product) and FP, which together provide 435 units (investments), in relation to 112 PP units, confirm the quality of the sample (Table 2).

Table 2 Number of investments per population subcategories in the period from PP (manufacturers of products of lower finalisation degree) 2007 to 2010<sup>4</sup>

<b>SUBCATEGORIES</b>	<b>MARK</b>	<b>NUMBER OF INVESTMENTS</b>	<b>%</b>
Primary product	PP	112	20
Semi-final product	PF	127	23
Final product	FP	309	57
Total from 2007 to 2010		548	100

Research variables (f1 – f7), which are stable by nature, together with the associated numerical values towards PP, PF and FP, are given in Table 3 and provide a statistical starting point for research.

Table 3 Investments into key factors of competitiveness

<b>Investments into key factors of competitiveness (Investment category)</b>	
<b>f<sub>1</sub></b>	Employee training
<b>f<sub>2</sub></b>	Marketing and promotional activities
<b>f<sub>3</sub></b>	Innovating products, services and production processes
<b>f<sub>4</sub></b>	Wood processing and furniture manufacture technology
<b>f<sub>5</sub></b>	Environmental protection technology
<b>f<sub>6</sub></b>	Energy efficiency technology
<b>f<sub>7</sub></b>	Spatial capacities

<sup>4</sup> Ojurović, R., 2010: Model investicijskih ulaganja proizvodnih subjekata Prerade drva i proizvodnje namještaja Republike Hrvatske u funkciji održivog razvoja, Doktorska dizertacija, Sveučilište u Zagrebu, Šumarski Fakultet, Zagreb.

### 3. Research results

The analysis was conducted on a sample of 548 statistical units, of which 112 (20%) belong to the PP subcategories, 127 (23%) belong to the PF subcategories, and 309 (57%) belong to the FP subcategories.

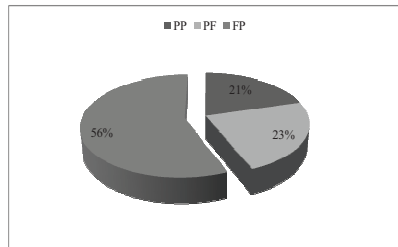


Figure 1 Percentage share of research variables

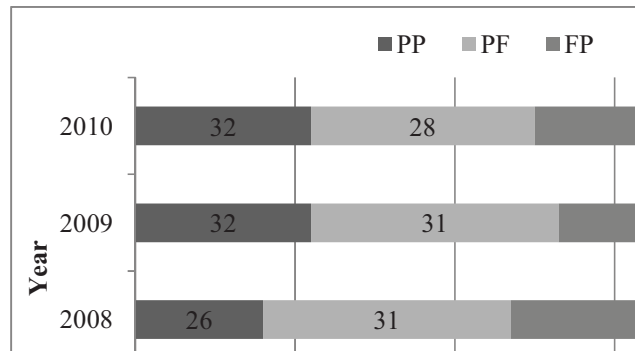


Figure 2 Number of investments per population subcategories from 2007 to 2010

In terms of the number of investments according to population subcategories (PP, PF and FP) for the period 2007 to 2010, the highest number of investments was achieved in the FP subcategories. It showed a positive growth trend in 2007 and 2008, while in 2009 there was a downward trend, to be followed by renewed growth the year after. The number of investments in the PF subcategories shows the annual systematic falling trend from 2007, unlike the PP subcategories which shows the annual systematic growth trend from 2007. The PP and PF subcategories show similar annual investment values, which is not satisfactory in the context of competitiveness, since it is realistic to expect, due to the complexity of production, a significantly larger share of investments into the PF subcategories (Figure 2).

Distribution of investments according to categories and subcategories for the period 2007 to 2010 shows the participation of investments of all three subcategories in the categories f4, f5 and f6. PF and FP invest into categories f2 and f3, while only the subcategories FP invests into the category f1. In terms of annual investment amounts according to categories, FP has the highest participation by all seven categories (Figure 3).

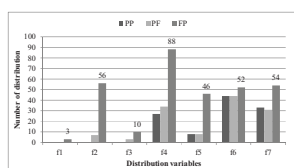


Figure 3 Distribution of investment categories (f1 – f7) per subcategories from 2007 to 2010

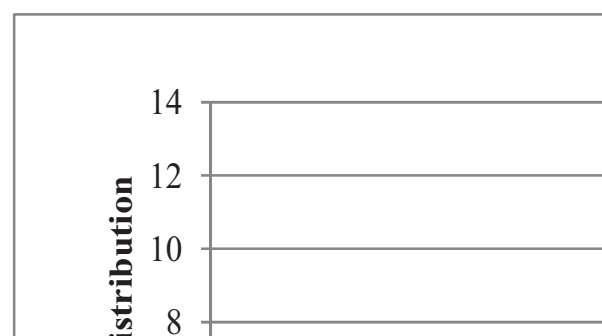


Figure 4 Annual distribution of investments per category in the PP subcategories

The annual investment distribution per category in the PP subcategories shows no investments into the categories f1, f2 and f3, and the highest investment amounts into the category f6 during all the four observed years. The highest number of investments into category f4 was realized in 2010 and the lowest in 2007. That same year there were no

investments into category f5, while the values for 2008 and 2010 are very similar. Investments into category f7 were highest in 2009 while in 2008 and 2010 they were more or less equal (Figure 4).

Distribution of investments per category in the PF subcategories from 2007 to 2010 shows that the highest investment percentage was made in category f6 (35%), followed by categories f4 (27%), f7 (24%), f5 and f2 (6%), to end with category f3 with distinctly low share of 2%. During the four observed years, there was no investment into category f1 (Figure 5).

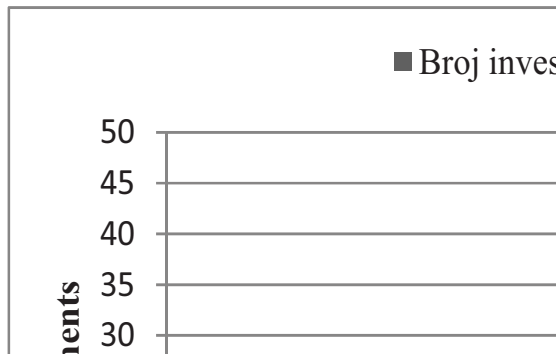


Figure 5 Distribution of investments per category in the subcategories PF from 2007 to 2010



Figure 6 Annual distribution of investments per category in the PF subcategories

The annual investment distribution per category in the PF subcategories shows no investment into category f1. The highest investment amount in category f2 relates to the year 2007, while other years show similar values. Category f3 is represented only in 2008 and 2009. The highest number of investments into category f4 occurred in 2010, while similar investment values in category f5 are present throughout the four years. Category f6 is best represented in 2007, and category f7 in 2008 (Figure 6).

Distribution of investments per category in the FP subcategories from 2007 to 2010 shows that the highest investment percentage (29%) occurred in category f4, followed by investments into categories f2 (18), f6 and f7 (17%), f5 (15%), to end with categories f3 (3%) and f1 (1%) with distinctly low share of investments (Figure 7).

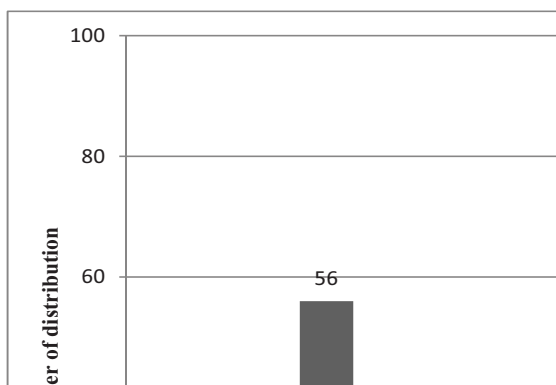


Figure 7 Distribution of investments per category in the FP subcategories from 2007 to 2010

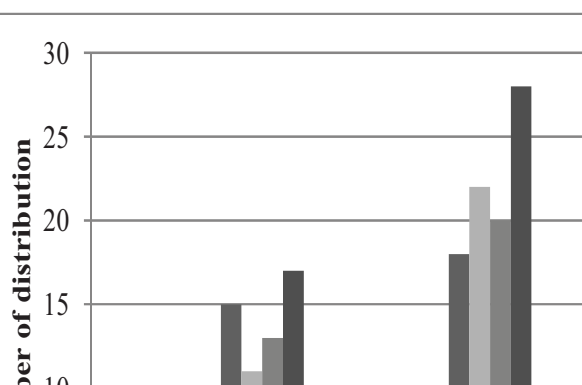


Figure 8 Annual distribution of investments per category in the FP subcategories

Annual distribution of investments per category in the FP subcategories shows that there were no investments in category f1 in 2010, while other years record similar investment values. The highest number of investments in category f2 occurred in 2010. In 2008, category

f3 was not represented, while the years 2009 and 2010 had similar values of investment amounts. The highest number of investments in category f4 occurred in 2010. Investments into categories f6 and f7 were equal in 2009 and 2010, while the highest number of investments in category f6 was realized in 2007, and in category f7 in 2008 (Figure 8).

#### **4. Conclusion**

In the late 1980s and early 1990s, wood processing and furniture manufacture industries, traditional export branches of the Republic of Croatia, were highly competitive on the European market, reflecting their own comparative advantages. The end of 1994 marked the beginning of market share loss due to competition from countries with lower costs of basic factors. The purpose of structural changes occurring during the transition period was to make a shift towards achieving higher levels of added value and using comparative advantages in a good quality and profitable manner. To produce something new requires adequate technologies. Maintaining ecological standards, as well as products, productions and technologies that are characterized by high energy efficiency are becoming increasingly more important elements of non-price competitiveness. Factors of energy efficient technologies and spatial capacities are material necessities for the achievement of the above goals. The results of research confirm that there is keen awareness of the above. Based on 548 investment projects in the period from 2007 to 2010, an analysis was made of investment amounts into energy efficient technologies by wood processing and furniture production in the Republic of Croatia. The analysis shows a positive growth trend. Annual investment distribution by category in the PP subcategories shows that in the period from 2007 to 2010, the highest investments, amounting to 39%, were precisely in the f6 category (Figure 4). Distribution of investments per category in the subcategories of semi-final products for the period 2007 to 2010 amounted to 35% (Figure 6), while that in the subcategories of final products was 17% (Figure 8).

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# CHANCES AND BOUNDARIES OF COMMUNITY BASED INNOVATION IN SMALL AND MEDIUM-SIZED ENTERPRISES – BASED ON THE STUDY OF WOOD-PROCESSING COMPANIES

*Katharina Rodharth*

## **Abstract:**

Community Based Innovation (CBI) is a concept that uses the innovation potential of online communities for product innovations and has been successfully applied by large producers of branded goods in the B2C sector. As a promising approach to reduce the risk of market entry of high-tech start-ups in the B2B sector the current study depicts the chances and boundaries of CBI in small and medium-sized enterprises (SME), focusing on the role of the customer in the innovation process of Austrian wood-processing companies in the B2B market. The main challenges for the study are the adverse qualities of Austria's timber industry: a high innovation potential and a strong traditionalism at the same time. The findings are based on eight problem-centered interviews and are a constituent part of the three-year research project N00092 "hi-tech center" financed by the European Territorial Cooperation Program of the European Union.

## **Key words:**

high-tech marketing, innovation, innovation process, open innovation, community based innovation, innovation community, marketing testbed, wood-processing companies, SME, Austrian timber industry

## **1 Introduction**

During a long time companies have been innovating new products and processes without participation of the public. This paradigm, the so called closed innovation, has experienced major changes throughout the past 40 years. Open innovation, the new paradigm, is characterized by integrating external knowledge and technologies into the innovation process (see illustration 1).<sup>1</sup> The internet and especially the Web 2.0 have greatly favoured this change: "*The primary resources for competitive advantage have shifted from financial capital to knowledge and information, fuelled by digital connectivity and increasing access to information.*"<sup>2</sup> Today online social networks are booming and customers are providing their know-how voluntarily and for free.<sup>3</sup> As the virtual integration of customers into the innovation process is presumed to accelerate the innovation of new products and consequently to reduce the risk of market default a new approach has evolved: Community Based Innovation (CBI). This concept actively uses customers' creativity and problem-solving capabilities throughout the innovation process (see illustration 2) and consists of four stages according to Füller et al. (see illustration 3)<sup>4</sup>.

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<sup>1</sup> CHESBROUGH, H.: *Open Innovation – The New Imperative for Creating and Profiting from Technology*. Boston: Harvard Business School Press, 2003, p. 52.

<sup>2</sup> ALLEE, V.; TAUG, J.: *Collaboration, innovation, and value creation in a global telecom*. In: The Learning Organization, Vol. 13, No. 6, 2006, p. 569.

<sup>3</sup> VON HIPPEL, E.: *Democratizing Innovation*. Cambridge, MA: The MIT Press, 2005, p. 77.

<sup>4</sup> FÜLLER, J.; BARTL, M.; ERNST, H.; MÜHLBACHER, H. HIPPEL, E.: *Community Based Innovation: How to Integrate Members of Virtual Communities into New Product Development*. In: Electronic Commerce Research, Vol. 6, No. 1, 2006, p. 5.

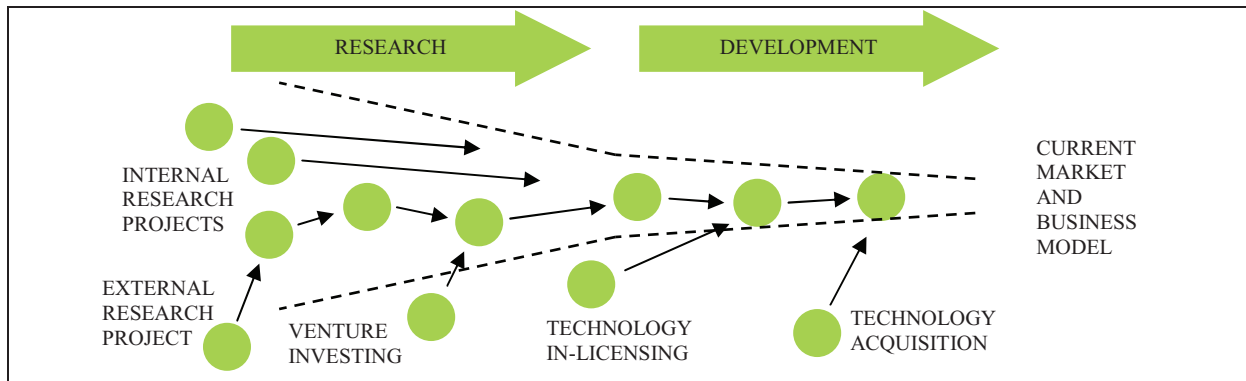


Illustration 1: Filling Gaps with external Technologies (CHESBROUGH, H.: *Open Innovation – The New Imperative for Creating and Profiting from Technology*. Boston: Harvard Business School Press, 2003, p. 183.)

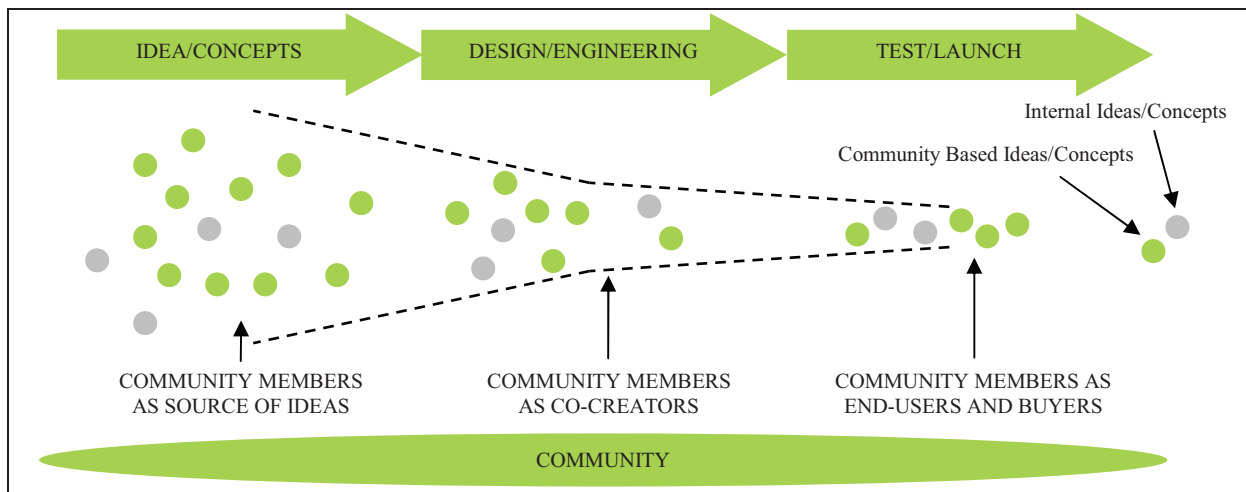


Illustration 2: Utilization of Communities in New Product Development (FÜLLER, J.; BARTL, M.; ERNST, H.; MÜHLBACHER, H.: *Community Based Innovation: How to Integrate Members of Virtual Communities into New Product Development*. In: *Electronic Commerce Research*, Vol. 6, No. 1, 2006, p. 57-73.)

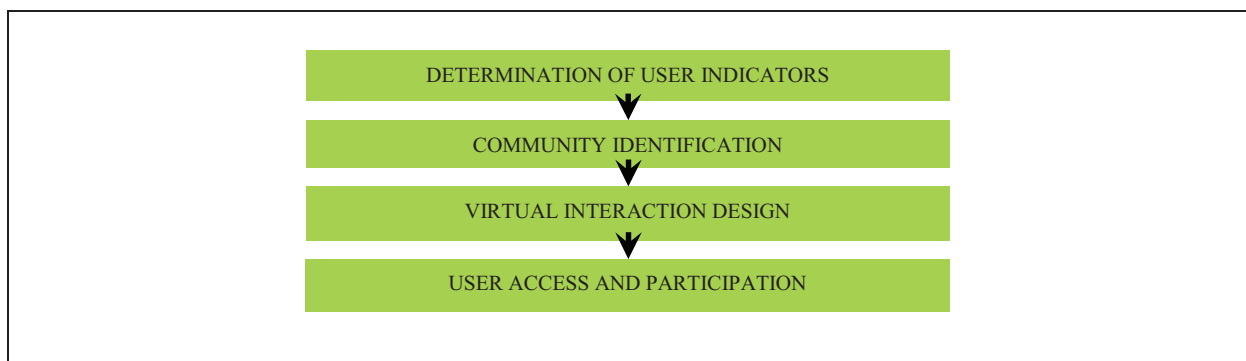


Illustration 3: Community Based Innovation Method (FÜLLER, J.; BARTL, M.; ERNST, H.; MÜHLBACHER, H.: *Community Based Innovation – A Method to Utilize the Innovative Potential of Online Communities*. In: *Proceedings of the 37<sup>th</sup> Hawaii International Conference on System Sciences*, 2004, p.3.)

Although the formation of the community and communication between its members is based on virtual interaction in this model, for the current empirical study online and offline interaction are considered equal for the following reason: Austrian wood-processing SME have a high innovation potential and are among the world leaders regarding products and technologies. Nevertheless, the sector describes itself as old-fashioned and interaction via virtual platforms does currently not happen. The author consequently applies the CBI concept to a non-virtual environment. The main challenge of this study is to apply the CBI concept, which has successfully been tested in the B2C sector, to the traditional Austrian woodworking B2B sector and to depict its chances and boundaries, paying particular attention to the role of the customer in the innovation process. Furthermore the study focuses on wood-processing companies in Styria, a federal state located in the south-east of the country, as its forest area, public innovation expenditures and labour force in the timber industry lie above Austrian average. The empirical findings are incorporated in the three-year research project N00092 “hi-tech center” and form a basis for further studies.

## 2 Research Questions

The two research questions are: (1) How does the product innovation process look like in wood-processing SME in the B2B sector in Styria? (2) From the wood-processing companies point of view, what are the chances and boundaries of CBI in wood-processing SME in the B2B sector in Styria?

Each research question is divided into three subquestions: (1a) How is the innovation community formed and how do its members interact (online/offline)? (1b) Who are the members of the innovation community? (1c) Who delivers ideas for product innovations? (2a) When are customers actively involved during the innovation process or when could they be involved? (2b) What advantages and disadvantages does the involvement of customers in the innovation process have and what potentials result from it? (2c) How big is the willingness to disclose intra-corporate know-how (protected or unprotected) to the innovation community?

## 3 Research Method

The problem-centered interview is considered as proper research method for studying customer needs in high-tech markets<sup>5</sup> and is often used to generate hypotheses for preparatory studies.<sup>6</sup> On the basis of a particularly designed problem-centered interview guideline (mind map) eight Styrian wood-processing SME were interviewed for the current study. The interview partners were selected on the recommendation of the Styrian Wood Cluster (non-probability sampling) based on predefined criteria (SME, B2B, headquarter in Styria, wood-processing company with high innovation activity). All interviews with the exception of one were carried out in the headquarters of the respective company and took place between 20 and 30 September 2011. The interview duration varied between 75 and 120 minutes. All interviews were recorded and transcribed between 20 September and 10 October 2011. The transcription document has 113 pages and is deposited at the Department of Marketing Management of the Vienna University of Economics and Business. The interview transcription document constitutes the basis of the analysis and interpretation for the empirical study but is not published as interviewees have been guaranteed strict confidentiality.

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<sup>5</sup> WITZEL, A.: *Das problemzentrierte Interview*. In: Forum Qualitative Sozialforschung – Theories, Methods, Applications, Vol. 1, No. 1, 2000, p. 1.

<sup>6</sup> KURZ, A.; STOCKHAMMER, C.; FUCHS, S.; MEINHARD, D.: *Das problemzentrierte Interview*. In: BUBER, R.; HOLZMÜLLER, H. (Hrsg.): *Qualitative Marktforschung – Konzepte – Methoden – Analysen*. Wiesbaden: Gabler, 2007, p. 465.

## 4 Results

To structure the collected empirical data the author chooses three approaches: (1) Innovation process by Hauschildt<sup>7</sup>: It is not possible to apply one specific innovation process model to all wood-processing SME. Although bigger companies follow a clear predefined innovation process, small companies do not even have innovation structures. “*We are just trying to make the best out of a need.*”<sup>8</sup> Their high innovation potential often remains idle, mainly due to limited capacities (e.g. staff shortage). Innovation structures could help small enterprises to optimize their tasks regarding innovations and to use new ideas. One option is establishing multi firm cooperative innovation structures by cooperative basic development and competitive marketing and sales of innovative products and services. Another option is to establish neutral innovation brokers by the federal timber association, who are forming micro markets of innovative business ideas. These innovation brokers are matching market interests of supply and demand. (2) CBI concept by Füller et al.: Physical interaction plays the most important role in the product innovation process of wood-processing SME and there is almost no virtual interaction taking place. Community members vary throughout the different stages of the innovation process. To fully apply the CBI concept developed by Füller et al. to the wood-processing companies the author adds two dimensions to the model: (a) Design of physical interaction and (b) selective user profile of community members within different stages of the innovation process. (3) Members of an innovation community: Internal community members refer to the management, R&D department members and employees to all other departments. External members of the innovation community can be customers, experts from related or other sectors, engineering offices, architects, research institutions, universities, the Wood Cluster, suppliers and competitors. Each member plays a different role throughout the innovation process.

Finally the two research questions can be answered as follows: (1) Product innovation processes vary greatly between businesses and within very small companies innovation often happens by chance. (1a) Wood-processing SME decide internally about the formation of the innovation community. Community members usually interact physically, via telephone or email. Online platforms play no active role in the innovation process. (1b) Members of the innovation community vary but almost always include the owner of the firm and the R&D department, if available. Further internal members can be employees of any other department. External members refer to customers, experts, suppliers, architects, universities or competitors. (1c) Most ideas derive from inside the company with the exception of the Wood Cluster and universities regarding basic research. Suppliers hardly ever deliver ideas for product innovations. (2) The chances of the CBI concept lie in the increasing willingness of wood-processing SME to open up their innovation processes and limited capacities that force them to use the great infrastructure and specific know-how of the Wood Cluster as well as in the growing awareness of the innovation potential of web-based platforms. Boundaries of the concept are the old-fashioned attitude of the sector, mistrust towards competitors, and that specific technical know-how makes it sometime difficult to include customers in the product innovation process. Furthermore traditional companies have a general aversion against any type of change and refuse new methods of innovation. (2a) Customer experience strong integration in the first and last stage of the product innovation process but there is only little involvement in the R&D stage of the process. (2b) Integration of the customers in the innovation process has a strong potential in the future. The main advantages are cost

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<sup>7</sup> HAUSCHILD, J.; SALOMO, S.: *Innovationsmanagement*. München: Vahlen, 2011, p. 20.

<sup>8</sup> Quotation by interviewee No. 6, 28 September, 2011.

reduction and a decreasing risk of market failure. The main disadvantage is the companies' fear of disclosing protected know-how. (2c) The willingness to disclose intra-corporate know-how is very small, as there is only little trust in external community members and a strong fear of loss of know-how to competitors. Hence cooptation is no strategic option nowadays.

## 5 Future Aspects/Recommendations

Based on the results of the empirical study the author draws four future trends for the CBI concept in the B2B sector of wood-processing SME: (1) Growing importance of alliances regarding marketing and innovation activities: Due to limited capacities SME will develop a growing demand for the support by the clusters. (2) Growing importance of the community: Time to market pressure and the need for fast product innovations will make the high potential of innovation communities indispensable. (3) Growing importance of web-based activities: As the awareness of the importance of the internet in respect of product innovations rises, traditional wood-processing SME will soon increase their online activities. (4) Market leadership: Although many Austrian woodworking companies have world leading technologies, fierce competition, mainly from Asia, will force them to improve their innovation process in terms of time and/or cost.

The author furthermore suggests the following three recommendations for wood-processing SME and their clusters/alliances: (1) Growing responsibility of the cluster for market development: Clusters will experience more power and indirect and direct influence in the innovation process of new products and should consequently use their networks and competence to increase community based innovation activities among SME. (2) Creation of awareness in wood-processing SME and cross industry awareness for wood-processing innovative solutions: Especially small companies should use the high innovation potential of communities as external know-how is an essential resource and often for free. (3) Quality as competitive advantage: The international attractiveness of the Austrian woodworking sector derives from the high quality of its products. The CBI concept will enable SME to furthermore keep up with international competition.

## 6 Summary

Increasing time to market pressure, limited intra-corporate capacities and competition from the countries own timber industry as well as from Asia force Styrian wood-processing SME to develop new products faster and tap their full innovation potential in order to guarantee attractiveness of the sector. The main findings of the empirical study can be summarized as follows: (1) The product innovation process varies strongly among the interviewed companies. One general model that holds for all innovation processes does not exist. (2) The author suggests expanding the CBI concept developed by Füller et al. by the two dimensions (a) *design of physical interaction* and (b) *selective user profile of community members within different stages of the innovation process* to enable equal existence of physical and virtual interaction. (3) Customers play an important role in the first and last stage (idea creation and market entry) of the innovation process. Universities, engineering offices and the Wood Cluster play a major role in the R&D stage of the innovation process. (4) Confidentiality and discretion have high priority for wood-processing SME, particularly concerning competitors. (5) The major chance of CBI is the growing readiness of companies to open up their processes which will favour the virtual integration of external community members. (6) Boundaries of the CBI concept are the prevailing traditionalism within the sector and little trust in external innovation community members.



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# THE CHANGES OF TOOLS STRUCTURE OF MARKETING COMMUNICATION IN THE FURNITURE INDUSTRY

*Rudolf Rybanský – Michaela Ondrušová*

## **Abstract:**

Tools of marketing communication are applicable in the various types of industry. The authors in scientific contributions deals with the changes of tools structure of marketing communication and with their new trends in the furniture industry. They analyze modern methods of purchase behaviour of consumer.

## **Key words:**

tools of marketing communication, new trends, furniture industry, purchase behavior of consumer

## **Introduction**

Marketing communication is applied in various ways within the Slovak furniture industry. The world economic and financial crisis affects this industry, too. The primary purpose of furniture companies is to address and attract a consumer by means of various marketing tools even at a period of recession. The companies which act in this branch of industry and want to be successful in an overstocked market, to achieve and to survive the strong competitive bussiness environment have to pay a special attention to marketing and marketing communication when designing the strategies leading to the sales of their products or services.

## **1 Furniture industry in the Slovak Republic**

The furniture industry, together with cellulose and paper industry and wood processing are included in the wood processing industry of Slovakia which is one of dynamically developed branches of industry.<sup>1</sup> It is an important industrial part of our economy but its market share is rather small. Recently, a more considerable inflow of foreign investors' investment into this branch have been experienced.

The wood processing industry has several significant characteristics. Its general characteristic is a wood processing and a manufacture of wood products at various levels of products finalization. This branch is shared mostly by small and medium-size firms. Big firms rarely occur in this branch but they have an important share in export. A high export efficiency of this kind of industry can be observed compared with other kinds of industry. We export particularly to advanced west markets, mainly to Germany, which is the most lucrative European furniture market. Most of our manufacturers produce following orders placed particularly by foreign global companies. The foreign customers send an exact design of their product and a Slovak firm delivers goods in compliance with their wishes and ideas. An export like this doesn't provide a large space for the Slovak designers' and manufacturers' own creative ideas.

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<sup>1</sup> <http://www.euroekonom.sk/download2/strategia-financneho-investovania/Financne-investovanie-Odvetvova-analyza.pdf>, (21.04.2012)

The furniture industry is situated nearly in each part of Slovakia. Regarding the processing of beech and oak logs performed by inland wood processors, there are some persisting problems with capability of higher appreciation of the raw material. The production is focused mostly on lumber and semi-finished products for the furniture industry. With respect to a lower effectiveness of wood processing, the inland companies are (in most cases) subcontractors of foreign companies. There is a persisting increased demand for pulp hardwood which is partially covered by import.<sup>2</sup> The input materials for solid timber as well as chipboard are independent in terms of the production input and we have sufficient sources of them in the regions of Slovakia.

Table No. 1: Wood processing within the wood processing industry branches

Branch	Wood processing volume (in m <sup>3</sup> x 1000) in the year		
	2008	2009	2010
<i>Wood processing</i>	3 581	3 159	3 493
<i>Furniture industry</i>	910	800	887
<i>Cellulose and paper industry</i>	2 577	2 197	2 901
<b>Wood processing industry - altogether</b>	<b>7 068</b>	<b>6 156</b>	<b>7 281</b>

Source: Green Report 2011, own processing of the table

Graph No. 1: Wood processing within the wood processing industry branches



Source: Green Report 2011, own preparation of the graph

The firms engaged in the furniture try to specialize in such part of their production range which is requested by the market and in production of which they reach the best results compared with the competition.

The manufacturers' aim is to maintain their stable position in the market despite the increase in the prices of input raw materials, goods, material, energy, interest rates of loans, labour costs and exchange rate differences. The furniture sales is being increased, but the home market is rather small. The home furniture consumption is affected especially by

<sup>2</sup> <http://www.mpsr.sk/index.php?navID=123&id=5250>, (21.04.2012)

a development of building industry. Housing construction and availability of flats has stagnated in a recent period. The inland market is defined by a low purchasing power of population. A loss of the east markets has a negative impact on the sales as well. The demand for the Slovak furniture is also being decreased by cheap import from China and Poland which is often preferred by people having a low income despite the quality and construction of the furniture. Nowadays this demand is on the decrease due to very poor quality and functionality of the products. The other demand is represented by innovation of residential and non-residential furniture as well as furniture for reconstructed premises.

Slovak furniture manufacturers try to keep abreast with home and foreign competition. They lay stress on the first class services, stable and flexible deliveries. They vitalize their production and subsequently they increase their products sales by means of continual innovation processes and competitive prices. The innovation processes regard the products, the firms focus on requested products and they adapt their business plan accordingly. Modernization regards machinery and production lines. New equipment and technological processes are obtained from abroad by means of a purchase of machines controlled by computers. The production programs and procedures are innovated as well. The products are adopted to new trends of up-to-date design. Furthermore, production capacities are restructuralized, an environmentally friendly kind of material of a good quality is used, high qualified and trained staff is engaged in the production and new trends are applied to sale the products.<sup>3</sup> By means of mutual effort the companies try to co-operate in order to reach the set business goals more easily. All the above mentioned attributes are the prerequisite for a high standard of furniture products and a guarantee of their quality. The next development of the furniture industry depends on how the business entities will be able to adapt quickly and effectively to the current development trends applied in advanced countries of the world.<sup>4</sup>

Important furniture manufacturers (enterprises with foreign capital participation acting in Slovakia within this branch) include companies Sweetwood and Lind Mobler producing furniture and furnishings for network of shops IKEA. Lacquered white furniture made of agglomerated material is produced for IKEA by a Slovak manufacturer – company Ekoltech. Company Furni Finish is an important manufacturer with foreign capital participation specializing in a production of sofas.

In terms of production volume and sales, the biggest inland manufacturer is Decodom – a company with a long-term tradition. Their production is exported mostly to Germany and their production programme is specialized in a high quality and affordable furniture. They took the lead in production of kitchen furniture that is exhibited in their own kitchen studios. Their trained employees, who work in the branded studios, provide their customers with a consulting service and develop an interior layout of the furniture in accordance with the customers' requirements by means of a graphic program. The company is specialized in a production of unit furniture for living rooms, dining rooms, halls, children's rooms and offices. Within their inland market portfolio they own some department stores in which they display their designs of kitchen sets and other kinds of furniture. In Slovakia, both manufacturer's profit and seller's profit belong to Decodom. As a manufacturer, they produce

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<sup>3</sup> MADLEŇÁK, A.: Otvorené inovácie – zvyšovanie efektívnosti inovačného procesu. In: *Interakcia masmediálnej a marketingovej komunikácie : zborník z medzinárodnej vedeckej konferencie*. Trnava : Univerzita sv. Cyrila a Metoda v Trnave, 2011. p. 226-227.

<sup>4</sup> <http://www.euroekonom.sk/download2/strategia-financneho-investovania/Financne-investovanie-Odvetvovana-lyza.pdf>, (21.04.2012)

the furniture themselves; as a seller, they sell the goods in their own department stores so the trade margin belongs to them, as well.<sup>5</sup>

Slovak company Sanas is a well-known manufacturer of furniture for inland and foreign market. They operate a series production and a made-to-order manufacture of kitchen units, tables, chairs, living room furniture, chests of drawers, office furniture, halls, bedrooms and upholstered furniture. Thanks to the investments to machinery, equipment and qualified staff they manufacture up-to-date furniture of a high level of quality, functionality and efficiency.<sup>6</sup>

Despite the fact we have sufficient skilled labour available, our companies are characterized by a low economic power, but a high debt ratio as well. That's why the foreign capital investment inflow is very important.

Slovak managers perform insufficient business activities within the furniture branch. The promotion of wood and wood products is not satisfactory – they lack an advertising campaign<sup>7</sup> performed within our country's regions as well as in other countries.

A necessity of forest certification allowed by forest owners and managers would be of a good help – it works as a mechanism to trace the certified raw material from the forest up to the final products so that the wood, wood fibres and non-wood forest products contained in the products can be traced back to the certified forests.<sup>7</sup>

## **2 Tools of marketing communication in the furniture industry**

Marketing communication is the most important supporting tool of marketing mix because its content affects hesitant or unconcerned customers in the most significant manner. It is more creative, more dynamic, more surprising and it reflects much more significantly a propagator's or a seller's personality. A personal approach is based on development of relationships with a customer and on an individual care.<sup>8</sup>

Consumer behaviour involves a purchase and a consumption. Prior to the purchase, during the purchase and after the purchase there are various mental and social processes. These stimuli express themselves by a choice of product, brand, price, time and the purchase quantity. The result of a consumer decision is expressed by a choice which is followed by a purchase. When taking the decision on the purchase the consumer experiences several stages – realizing the need, a decision on the purchase and the purchase execution. Apart from a decrease in purchasing power at the time of economic crisis, which is a limiting factor of population's purchasing power, the consumer behaviour is affected by experience and recommendations of friends and relatives, advertising, a current emotional state of mind or an effect of negative information regarding the crisis impacts.<sup>9</sup> The above mentioned factors are closely connected with the fact that the crisis is often accompanied by psychological effects that are reflected in a purchasing behaviour of consumer which is significantly influenced by them. This state of mind, supported by mass media information impact, evokes an increased sense of insecurity of the consumers and it makes them to be careful in their spending so they don't decide to replace their old furniture. In this sense, the crisis would have a significant real impact on the consumers' expenses only in case they lose their job.

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<sup>5</sup> <http://www.decodom.sk/31/o-spolocnosti/dlha-historia>, (21.04.2012)

<sup>6</sup> <http://www.sanas.sk/content.php?l=308>, (21.04.2012)

<sup>7</sup> <http://www.pefc.sk/sk/obhospodarovanie-lesov/certifikacia-tuol>, (21.04.2012)

<sup>8</sup> MATUŠ, J.: *Marketing základy a nástroje*, Trnava: FMK UCM, 2008, p. 114-116.

<sup>9</sup> <http://ekonomika.etrend.sk/ekonomika-slovensko/co-robi-kriza-so-spotrebitelmi.html>, (21.04.2012)

Nowadays, the traditional communication tools of marketing communication within the furniture industry are being weakened<sup>10</sup> because the companies apply new trends to attract the customers and to meet their business goals.

- *mobile marketing* – application of mobile communication by means of sms and mms,
- *product placement* – presentation of a product in an audio-visual work by means of major characters, application of 3D technology effect to offer a three-dimensional vision to the viewers that allows them to see the made scenes with an illusion of depth<sup>11</sup>,
- *viral marketing* – a spread of advertising information by means of e-mail sent by a well-known person in a form of a message, a logo, a presentation, a game, a quiz, a video-clip,
- *guerilla marketing* – a non-cost and unconventional type of communication, never-ending universal marketing that creates a maximum profit from minimum investment, it isn't aimed to a company's publicity, its goal is to strike „at the right time – on the right place“, to focus on the aim and to withdraw immediately after the attack,<sup>12</sup>
- *neuromarketing* – it studies an impact of the stimuli on both the customers' and consumers' reactions at the same time. It regards cognitive, affective and sensorimotor stimuli. It studies and investigates functions of the brain when making the decisions to buy the goods. It is a tool which is used to discover real and right preferences of a consumer, to find a purchase starter. In this regard, the acting upon the consumer is a subliminal one.<sup>13</sup>

The most conventional marketing communication tool used by furniture manufacturers to present their products is a personal selling. This tool is the most expensive one, but the most effective one as well. The companies establish their own department stores in which they display their furniture and offer their services. Their quality can be tested just right in the show room. A professional consulting service is available for a customer as well as inspiration by the displayed designed furnishing.

The most conventional and the most visible communication tool, applied by Slovak furniture manufacturers to call attention to themselves, is an advertising. The advertising motivates the customer's behaviour and pushes him/her to actions leading to an objective which meets his/her requirements.<sup>14</sup> The advertising is spread by various mass media e.g. newspapers, magazines, printed material, radio, television and outside advertising. Mass media transfer information and generate an image of a particular product. Nowadays, the advertising faces a problem of a low trustworthiness, breaking the rules of ethics and morals and it is expensive.<sup>15</sup> Our furniture manufacturers prefer a handbill form of their products and services presentation. They insert the handbills into newspapers and magazines or they put them on the counters in their shops. By means of the handbills they motivate the customer's behaviour and push him/her to actions leading to an objective which meets his/her requirements. They call the customers' attention to current offers, actions, news and furniture trends.

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<sup>10</sup> Personal selling, sales promotion, advertising, public relations, direct marketing

<sup>11</sup> <http://www.zive.sk/3d-technologie-skodia-ociam-varuju-optici/sc-4-a-292633/default.aspx>, (21.04.2012)

<sup>12</sup> ČÁBYOVÁ, E.: *Benchmarking Comparison in the Area of Marketing Communication*, Trnava: FMK UCM, 2009, 1. <sup>st</sup> edition, p. 63 - 66

<sup>13</sup> <http://www.ruonline.sk/neuromarketing-%E2%80%93-revolucia-v-skumani-spravania-spotrebitela>, (21.04.2012)

<sup>14</sup> RYBANSKÝ, R.: *Základy manažmentu*, Trnava: FMK UCM, 2011, 1<sup>st</sup> edition, p. 145.

<sup>15</sup> ČÁBYOVÁ, E.: *Benchmarking Comparison in the Area of Marketing Communication*, Trnava: FMK UCM, 2009, 1. edition, p. 44



There is an antipole of the handbill form of advertising – advertising in periodicals and magazines on housing. Several new trends can be noticed in the sector of TV advertising. By means of „product placement“ tool, some furniture items are placed into a film story and through the major characters they are presented as a standard part of their life. Another tool is a production of advertising spots referring to saving money. They quantify the financial means a consumer might save by purchasing the product. It regards a remission of the fee for the design development in case the furniture is ordered, a free assembly, a free transport, a remission of the fee for a loan processing, a loyalty discount, a loyalty bonus card, refreshments, bonuses obtained for repeated purchases. Sponsoring of TV broadcasts on cooking is another tool – by means of the kitchens furnishing or by donating a present for a winner. Provision of a scrappage bonus (old furniture disposal in return for purchase of new furniture) has recently become very popular. This kind of service is free of charge in case the customer's purchase exceeds a determined price volume. Other alternatives coming to the fore involve a remission of some price components in case of order, a possibility to purchase via internet (by means of which customers pay less than in a stone shop for the same goods). The sales are supported by provision of samples, coupons, bonuses, participation in a contest or lottery, gifts and provision of a longer warranty.

When making the purchase decision, this process is entered by information on the product promotion which is important for strengthening and recovery of a consumer's trust. A key role is played by consultees, especially during the development of graphic designs of individual furniture sets, particularly kitchens. A consumer can be addressed and impressed by another way – by means of campaigns that are focused on support of Slovak products purchase, on support of healthy sleep or comfortable sitting.

The manufacturers meet their customers' requirements by means of made-to-order manufacture, atypical products manufacture meeting the consumer's specific ideas and requirements. The manufacturers take the opportunity to take part in exhibitions and trade fairs. An international furniture exhibition and trade fair is annually organized in Slovakia (at Agrokomplex, Nitra) in which the exhibitors manifest their creative ability to use wood as a nature's gift, they introduce new trends and current design in the branch of the furniture industry.<sup>16</sup> Moddom (at Incheba, Bratislava) is an important exhibition as well – it is focused on presentation of the very best which was achieved in the sphere of housing, interior enhancement, reconstruction, furnishings and it is a display of various styles of housing design and new housing trends presented by Slovak and foreign designers.<sup>17</sup>

Quite important is also a provision of advertising information on testing and recommendation of a product of a specific brand and a spread of a good reputation among both regular and new potential customers. The references are sent verbally, by means of mobile phone or viral marketing from acquaintances to other towns or countries.

All the above mentioned forms involve the tools for manipulation of consumers' purchase behaviour and their motivation for a purchase.

The complex of the marketing communication tools and their interaction is called a communication mix.<sup>18</sup>

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<sup>16</sup> <http://nitra.sme.sk/c/6285117/veltrh-nabytku-predstavi-nove-trendy-v-nabtykarskom-dvetvi.html#ixzz1tBG9S5hG>, (21.04.2012)

<sup>17</sup> <http://www.velkaepocha.sk/2010101714957/MODDOM-medzinarodna-vystava-o-byvani.html>, (21.04.2012)

<sup>18</sup> ČABYOVÁ, E.: *Benchmarking Comparison in the Area of Marketing Communication*: FMK UCM, 2009, 1. edition, p. 44



## Conclusion

In conclusion we can say that the marketing tools are still assigned a task to produce consumers' trust in specific brands' products and services. A research of the marketing tools structure and their new trends in affecting the purchase behaviour of consumer deals with a demanding scope of problems. We can say that under conditions of market economy it is not possible to predict and estimate a change of the demand for the furniture industry products and services caused by the influence and impact of the world economic and financial crisis and the limiting factors resulting from the crisis.

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# NEW TRENDS IN THE INTEGRATION OF SUPPLY CHAIN MANAGEMENT AND ITS USE IN THE WOODWORKING INDUSTRY\*

*Kristína Štefančíková*

## **Abstract:**

The purpose of this article is to give an overview about the potential uses of new trends related to the integration and implementation of supply chain management practices in terms of strategy. The author addresses the issues: first, the integration of core processes across organizations to better communication, partnerships, alliances and cooperation. Second, strategy and planning, supply chain management as a strategic issue for business partners and third, issues of critical factors for successful implementation, as well as specific interdisciplinary aspects of supply chain management in wood processing industry.

## **Key words:**

supply chain management, integration, management strategy

## **Introduction**

The integration of supply chain management systems is been the subject of significant debate and discussion also in the wood processing industry. As organizations seek to develop partnerships and more effective information links with trading partners, internal processes become interlinked and span the traditional boundaries of firms. Physical logistics become more dependent on information technologies, and these technologies can also become enablers of further cooperative arrangements. Firms are then faced with the management of an extended enterprise as a network of processes, relationships and Technologies creating an inter-dependence and shared destiny. The truly strategic nature of supply chain management thus becomes apparent for participating companies, with successful implementation becoming a source of competitive advantage as well firms, operating in areas for the wood processing.

## **1 Supply chain integration General**

The integration of supply chain processes through investment in cooperative arrangement and technologies is difficult to separate from, or consider independently of, the strategic positioning of organizations. Effective supply chain integration requires effective implementation, and implementation uninformed by strategy will at best produce little in the way of tangible benefits for the parties involved, and at worst be counter-productive and erode competitive advantage. As such the three elements that are the focus of this study are inter-linked and inter-related, and an examination of the literature in each of the three areas can throw some light on issues of importance for one or both of the other two. The purpose of supply chain management is described by Kaufman as to being to “...remove communication barriers and eliminate redundancies” through coordinating, monitoring and controlling processes. The integration of supply chains has been described as: „attempting to elevate the linkages within each component of the chain, (to facilitate) better decision making [and] to

*get all the pieces of the chain to interact in a more efficient way (and thus) create supply chain visibility (and) identify bottlenecks.*<sup>1</sup>

The **main drivers of integration** are listed by Hicks as:

- the information revolution;
- increased levels of global competition creating a more demanding customer and demand driven markets; and
- the emergence of new types of inter-organizational relationships.<sup>2</sup>

They describe the three principal elements of an integrated supply chain model as being information systems (management of information and financial flows), inventory management (management of product and material flows), and supply chain relationships (management of relationships between trading partners).

**The basis of integration** can therefore be characterized by cooperation, collaboration, information sharing, trust, partnerships, shared technology, and a fundamental shift away from managing individual functional processes, to managing integrated chains of processes.<sup>3</sup> The extent of integration can begin with product design, and incorporate all steps leading to the ultimate sale of the item. Some authors also include all activities throughout the useful life of the product including service, reverse logistics and recycling.<sup>4</sup>

The potential for integration of the supply chain to improve both profit potential and competitive position is highlighted by Wood when he states that: „since the supply chain represents 60 % to 80 % of a typical company’s cost structure, just a 10 % reduction can yield a 40 % to 50 % improvement in pretax profits.<sup>5</sup> Cottrill states that the evolution of the concept of integration has moved over time to one in which the supply chain operates as a corporate entity, spans a virtual enterprise without reference to traditional company boundaries, and can be driven directly by customer demand via access to electronic storefronts. He states that this trend will create major changes in many companies, eventually leading to greater use of outsourced services. He also believes that the key to implementation lies in focusing initially on introducing changes within the company, and then extending the process to include suppliers and customers. The primary benefits resulting could include cost and cycle time reductions. Hereinafter focuses on the importance of aligning goals across functions through cooperation and collaboration, and cites the traditionally poor alignment of goals between manufacturing and sales/distribution functions as an example of opportunities for better alignment as a precondition for improvement in supply chain management practices. This cooperative theme is further supported by Parnell, when he states that supply chain integration really occurs when: *„customers and suppliers establish tight partnerships with the objectives and probable outcomes of reduced inventory, shorter lead times and better service to the customer.*“<sup>6</sup>

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<sup>1</sup> KAUFMAN, R.: Nobody wins until the consumer says, ‘I’ll take it, 2007, p.14.

<sup>2</sup> HICKS, D. A.: The state of supply chain strategy, 2009, p. 26.

<sup>3</sup> AKKERMANS, H. et al: Virtuous and vicious cycles on the road towards international supply chain management, 2009, p. 569.

<sup>4</sup> BALLOU, R. H. et al.: New managerial challenges from supply chain opportunities, 2000, p. 11.

<sup>5</sup> WOOD, A.: Extending the supply chain: strengthening links with IT, 2007, p. 26.

<sup>6</sup> PARNELL, C.: Supply chain management in the soft goods industry, 2000, p. 60.

## 1.1 Information flows

Effective application of information technology to the integration of supply chain activities has the effect of reducing levels of complexity. Senge defines two types of complexity, *detail* and *dynamic*. Detail complexity exists when there are many variables needing to be managed.

**Dynamic** complexity exists where cause and effect are separated, and difficult to associate, in both time and space: „situations where cause and effect are subtle, and effects over time of interventions are not obvious. Conventional forecasting, planning and analysis methods are not equipped to deal with dynamic complexity.

The “*bullwhip effect*” is an example of a typical supply chain management outcome resulting from circumstances that are dynamically complex. Senge defines this effect thus: „*This phenomenon states that the demand process seen by a given stage of a supply chain becomes more variable as we move up the supply chain (i.e. as one moves away from customer demand). In other words, the orders seen by the upstream stages of a supply chain are more variable than the orders seen by the downstream stages.*“<sup>7</sup>

Symptomatic of this effect are excessive inventories, low customer service levels, inaccurate and untimely capacity planning, lost income, increased transportation costs and ineffective production scheduling also state that access to, and management of, information is critical to minimizing this type of variation: „*Innovative companies in different industries have found that they can control the bullwhip effect and improve their supply chain performance by coordinating information and planning along the supply chain.*“<sup>8</sup>

Lee sees the primary influences as being irrational. Supply chain management integration and implementation human behaviour driven by a misunderstanding of real demand. He believe that the problem lies in the infrastructure of the supply chain itself, identifying practices such as demand forecast updating, order batching, price fluctuation and rationing and shortage gaming as the key drivers. Where there is convergence is in the importance of reliable and timely information ist makes the point that timely information is not necessarily the solution on its own: Carried to its extreme, the result of more timely information can be harmful.

The effect can be to cause the manager to put more and more stress on short-range decisions the system improvements did not result so much from changing the type of information available or its quality nearly so much as from changing the sources of information used and the nature of the decision based on the information. This view states that knowledge resides in the user and not in the collection of information and it is how the user reacts to a collection of information that matters.<sup>9</sup>

Have been a large number of software applications developed to allow better flow of information throughout the supply chain including: *Enterprise resource planning* (ERP) systems, order management systems to automate the order fulfilment process; demand planning systems for managing and monitoring forecasts; warehouse management systems for inventory management, picking and placement; transport management systems for the planning and dispatching of shipments; advanced planning and scheduling systems for developing and managing production plans; customer relationship management systems for providing customer service, support and intelligence on customer demographics; data warehousing applications able to store, analyse and report corporate data stored in many

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<sup>7</sup> SENGE, P. M.: *The Fifth Discipline : The Art and Practice of the Learning Organization*, Century Business, London. 2000, p. 71.

<sup>8</sup> HICKS, D. A.: *The state of supply chain strategy*, 2009, p. 28.

<sup>9</sup> VADKERTIOVÁ, A.: *Information systems for managers*, UCM in Trnava, 2009, p. 219.

different systems in customized format. These systems have usually suffered from the fact that they have been “bottled up” within parts of an organization, or even the supply chain, and have not easily been linked to one another<sup>10</sup>.

With the emergence of the personal computer, optical fibre networks, the explosion of the Internet and the World Wide Web, the cost and availability of information resources allows easy linkages and eliminates informationrelated time delays in any supply chain network. Adds that with the emergence of the personal computer, optical fibre networks, the explosion of the Internet and the World Wide Web, the cost and availability of information resources allows easy linkages and eliminates informationrelated time delays in any supply chain network and that the notion of an **integrated supply chain** is not a new one, but that it has only recently become feasible as companies have access to information that is accurate, timely and affordable. They also make the point that information is the only element within the supply chain that has become less expensive over time.<sup>11</sup>

## 1.2 Physical logistics

**The importance of the management of physical inventory** is being amplified by the following factors; decreasing product life-cycles; decreasing levels of standardization of products and demands for customization; customers demanding shorter delivery lead times; increased levels of competition due to globalization and lowering of tariff barriers; and increasing levels of dynamism (rate of change), complexity (number of changes) and uncertainty (what will change?) in global markets. The physical distribution of goods is also affected by **distribution centre and facility location decisions**. Akkermans state that the main decision criteria for the logical design of a global outgoing logistics network are: number of distribution centres; where they need to be located; methods of distribution and capacity each should have; customers that each centre will service by product and order type. For incoming logistics they see the major issues as being: if they are rationalising the supplier base, which suppliers to drop and which to keep; which suppliers should supply each plant by class of parts.<sup>12</sup>

Wood notes that there has been a shift away from applying technological solutions to physical distribution systems such as **racking systems, trucks and automated warehousing**. He sees the focus moving to **information technology** as a result of diminishing marginal returns in physical handling technologies, although he does note that these technologies are being embedded in many material-handling systems such as forklift trucks and automated materials handling systems. This does not, however, mean that the physical side of the distribution issue is no longer significant, or is indeed diminished in terms of its ability to provide a source of competitive advantage. Companies have failed to pay sufficient attention to areas such as transport and logistics, distribution, and purchasing. The most serious problems companies face are the continuing internal functional focus, a failure to align their IT systems and organizations with supply chain needs, and the traditional nature of their relations with external suppliers and customers.<sup>13</sup>

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<sup>10</sup> HUSON, M. - OWENS, V.: The supply chain technology evolution, [online] (accessed 4 June 2000) [cit. 2012-03-27]. Available at: <<http://www.electroneconomy.com>>.

<sup>11</sup> LEE, H. L. et al.: The bullwhip effect in supply chains, 2007, p 96.

<sup>12</sup> AKKERMANS, H. et al: Virtuous and vicious cycles on the road towards international supply chain management, 2009, p. 572.

<sup>13</sup> WOOD, A.: Extending the supply chain: strengthening links with IT, 2007, p. 28.



## 2 Partnerships, alliances and cooperation

Without a foundation of effective supply chain organizational relationships, any efforts to manage the flow of information or materials across the supply chain are likely to be unsuccessful. Companies that make supplier relationships a priority are rewarded with better financial performance and greater customer satisfaction. Porter found that only a small number of companies really leverage their supplier relationships. The major reason identified is the need to recognize and include key strategic suppliers as early as possible in order to set joint objectives and align business goals. The cooperative model, by way of contrast traditional supplier relationships- traditional models, focuses on the sharing of information (and in some cases assets) between organizations, recognising areas of common interest and mutual competitive advantage. In the context of a complex rapidly changing supply chain management environment, the cooperative model has become a critical element for effective implementation. The key driver for this need to recognize the “common interest” has been a fundamental shift in power toward the customer. As the customer begins to dictate terms in the marketplace, issues of interdependency between members of a supply chain become more critical. The emphasis appears to be very much on managing and controlling partners, perhaps at the expense of setting up mutually beneficial partnerships. Define trust in this context as: *„a general expectancy held by a channel member that the word of the other can be relied upon. That is, one party has confidence in an Exchange partner’s reliability and integrity.“*<sup>14</sup>

The integration of supply chain processes can provide an effective means by which costs can be reduced and customer service levels improved. The formula for integration, however, is not a simple one. Organizations that aim to become part of an extended, integrated supply network can also expect that this will require an infrastructure enabling effective information flows and streamlined logistics. A key component of this infrastructure will be based on robust and durable collaborative arrangements with trading partners. The most effective of these networks will be those that are able to get the mix of information requirements, physical logistics and collaboration right, providing shared benefits to a majority of partner organizations.

## 3 Strategy and planning

Porter offers this view that in analysing the potential for internet-based technologies to alter competitive environments, he sees a major opportunity for organizations to differentiate themselves on the basis of a distinctive value chain. In fact, he states that this may be one of the few ways in which companies can develop a sustainable competitive advantage using internet technologies, as the overall effect of their adoption will be to intensify competition, lower barriers to entry and increase bargaining power of both buyers and suppliers:

*„Basic Internet applications will become table stakes – companies will not be able to survive without them, but they will not gain any advantage from them. The more robust competitive advantages will arise instead from traditional strengths such as unique products, proprietary content, distinctive physical activities, superior product knowledge, and strong personal service and relationships. Internet technology may be able to fortify those advantages, by tying a company’s activities together in a more distinctive system, but it is unlikely to supplant them.“*<sup>15</sup>

One strategic outcome of supply chain integration can be “channel consolidation”, or the concentration of control of distribution channels by a small number of players. In this case

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<sup>14</sup> PORTER, M.: Strategy and the internet. In: *Harvard Business Review*, 2001, p. 69.

<sup>15</sup> PORTER, M.: Strategy and the internet. In: *Harvard Business Review*, 2001, p. 78.



there will undoubtedly be winners and losers as suppliers into these channels also will likely be consolidated. Porter identify four strategic responses for manufacturers finding themselves confronted with this situation:

- 1) partner with the winners: appropriate when the winners are easy to spot;
- 2) invest in fragmentation: work with marginalized distributors to create alternative channels;
- 3) build an alternative route to market by forward integration and (perhaps) use of the internet; and
- 4) create new channel equity: use differentiation and develop brand equity.<sup>16</sup>

In the context of Porter's analysis of the impact of internet technologies on the competitive environment, the prospect of consolidation is perhaps a very real one in many industries. In this context, the importance of having a coherent supply chain strategy, rather than just a strategy for the operation of the individual enterprise, could become even more important as time goes on.

Hicks states that the goal of strategic supply chain planning is to arrive at the most efficient, highly profitable supply chain system that serves customers in a market and that decisions of this nature typically carry high expenditures and significant risk. He identifies two different approaches to supply chain improvement, focusing on either information technology or logistics. The first has information as the key to supply chain improvement, with the primary focus being on collaborative planning, sharing information and getting companies synchronized with suppliers and customers. The second is more internally focussed and is concerned with quantitative analysis of complex logistical problems. He states that the future of supply chain strategy lies in the convergence of these two paradigms, and recommends a four-step process for strategic planning:

- 1) network optimization: design the least cost network focusing on customer demand;
- 2) network simulation: test alternative models to predict supply chain behaviour;
- 3) policy optimization: develop best operating rules (e.g. how much inventory to carry for each product line); and
- 4) design for robustness: anticipate unforeseen circumstances and possibilities.

This final step is the most difficult, and the most important. As Hicks states; "*optimal answers are not always the best answers*".<sup>17</sup> Given the importance of this step, it is interesting that he spends the least amount of time on explaining how this may be achieved. Provide some insight into why this issue is so important by stating: The explosion of marketing activity and intensity of customer demand has thrown many companies' supply chains into a tailspin. Their systems were not designed to meet the requirements currently placed upon them. Although it is desirable to model the behaviour of a supply chain in order to make informed planning decisions, the issue of dynamic competitive environments makes this an activity that is at best difficult, and at worst perilous.<sup>18</sup>

The configuration and operation of supply chain activities and resources provides significant potential for developing new and alternate sources of sustainable competitive advantage. In fact, in many industries, this may provide one of the last sources of such an advantage as product standardization and commoditization gravitate competition toward price, and sources of differentiation become more difficult to establish. The potential for an integrated supply chain to provide an alternate source of differentiation both highlights the

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<sup>16</sup> PORTER, M.: Strategy and the internet. In: *Harvard Business Review*, 2001, p. 79.

<sup>17</sup> HICKS, D. A.: The state of supply chain strategy, 2009, p. 27.

<sup>18</sup> ŠTEFANČIKOVÁ, A.: MIS - Marketing Information System, FMK UCM in Trnava, 2006, p. 115.

importance for organizations of developing a competency in this area, and begs the question as to why it is still the domain of a minority. Some explanation for this phenomenon is perhaps provided by examining issues relating to the implementation of integrated supply chain management solutions.<sup>19</sup>

## 4 Implementation issues General

Putzger states that the key criterion in implementation is correct choice of information technology, and that the use of third-party providers for both transportation and information management is the option chosen by successful performers. He says that many companies are unsuccessful in implementation because they simply are unable to come to agreement on terms. He notes that is seven critical success factors:<sup>20</sup>

- 1) a committed organization, from the board down;
- 2) effective programme management;
- 3) consistent, pre-emptive communications;
- 4) positive action to identify and manage key risks before they become issues;
- 5) a well-defined and managed programme baseline, changed as necessary;
- 6) a succession of manageable delivery milestones to maintain momentum and confidence; and
- 7) an actionable, owned, manageable and measurable set of business benefits.

Putzger adds recommends that a range of issues need to be considered when planning for implementation. He emphasizes the importance of business processes supporting new systems, the importance of education in demand management and system optimization, and the need for performance measures to support behavioural change.<sup>21</sup>

## Conclusion

Implementation of technologies and methodologies for the management of supply chains is likely to be accompanied by significant intra and inter-organizational change. This will manifest itself in particular in the area of process re-design, and in many cases the development of entirely new processes. An important factor in determining the success (or otherwise) of any implementation will be choosing the right areas of focus, and understanding the implications of the implementation for all trading partners.

Whether the process for integration is vertical or virtual, the requirement for integration of supply chains is inherently strategic, and a potential source of competitive advantage for multiple trading partners. The nature of the integration model is an implementation issue that needs to be addressed with a view to customer needs and other variables such as industry and market characteristics.

One theme that appears to hold constant in this area is the importance of taking a holistic view, and the systemic nature of interactions between the participants. The recognition of the inter-dependence of all partners in a supply network appears to be an important pre-cursor to effective integration. In this sense, organizations moving to implement integrated supply chain management systems could be seen to be formalising strategies to better manage this inter-dependence, and to leverage it to mutual advantage.

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<sup>19</sup> NOVÁKOVÁ, R.: Utilising portfolio methods in the strategic planning of product quality, 2011, p. 76.

<sup>20</sup> PUTZGER, I.: All the ducks in a row, 2008, p. 55.

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# NEED FOR INTEGRATION OF ECODESIGN IN THE PROCESS OF SHAPING THE PERSONALITY OF FURNITURE DESIGNER

*Zuzana Tončíková*

## **Abstract:**

The contribution discusses the need for implementation of eco-design in the process of shaping designer's personality even at the stage of study. A future designer has to learn how to apply at his work ecological procedures automatically. In the first part of a contribution is elaborated a comprehensive overview of present ways of ecodesign implementation into the companies and ecodesign projects. Currently available methods are not universally applicable neither at the works of furniture design students nor at that of independent furniture designers. Thus a furniture designer is not quite flexible to meet requirements of a desired environmental management. The last part presents a developed methodology concept for the implementation of eco-design in the educational process.

## **Key words:**

education, eco-design, integration, designer, tools, industrial design

## **1 Present ways of ecodesign implementation**

Currently, there is available and validated many procedures, tools, and manuals that try to convey and demonstrate the possibility of ecodesign implementing. These more or less precise "instructions" are very similar. They were primarily designed for companies and businesses and their use requires the preparation of a project team. Its task is to implement ecodesign for a selected product or services and to integrate requirements of ecodesign into internal business processes. A designer becomes in this process only one of project team members and his role is only one of many.

Large companies, as far as they decide to exploit the potential for ecodesign for their products or services, usually hire external consultants. They prepare a whole ecodesign project for realization and provide methodical and consultation services. Smaller and medium sized businesses may apply eco principles by the application of simplified operations based on the best guidelines, software and steps for implementation. The objective is to reduce time, personnel and financial resources for ecodesign project.

One of the best practices in the Central European region is the system of the 12 steps according to Prof. W. Wimmer. "These "steps" provide comprehensive guidance on how to improve the environmental performance and behavior of a product and the whole company."<sup>1</sup>

In this sense, there was developed also the Center of Innovation and Development of the Czech Republic within the Leonardo Da Vinci Programme project called "Transfer of information about ecodesign". This centre published its own ecodesign simple manual summarized into eight steps.

### *Life Cycle Assessment*

Ecodesign is based on the concept of a product life cycle. Life cycle analysis is the most important and also the most difficult step, which is the part of the serious procedures

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<sup>1</sup> Wimmer, W., Zust, R., Lee, K., *Ecodesign Implementation*, Springer 2004, 157p.

concerning the ecodesign implementation. Requirements for the life cycle assessment (LCA) method are specified in the revised technical standards ISO 14000.

It should be noted, that for the needs of designers in the market, there is available a number of accessible databases and software for the LCA analysis. SimaPro is the most widely used LCA software. It offers also a standardisation, so stakeholders trust to results, as well as an ultimate flexibility. Furthermore, there is for example GEMIS, or databases integrated in programs such as Solid Works or Inventor and many others. Programs that meet the needs of designers in the best way are ECO-it, Ecodesign Pilot and Ecoscan. Available are also LIDS Wheel, or a unique tool developed by OVAM ecolizer 2.0.

Another look at ecodesign implementations certainly offers concepts as "cradle to cradle" or "biomimicry". The essence of the "cradle to cradle" concept is the identification of biodegradable materials of a product which are able to be decomposed and to serve again as reusable components. Thus they do not wander into "grave", but become the cradle for future products. However, in order to avoid deterioration of the obtained components for further use, it is necessary to design products, as well as, all material cycles in order to allow it. What is necessary, is to separate the biological cycle from the technological cycle, so that they can both work independently and do not contaminate each other. "If is the production and consumer system compatible with nature, any waste is harmless. However, if is the system incompatible, no matter how effective will be, always remain harmful." <sup>2</sup>

This concept is one of the best ideas on how to design and create products in harmony with nature. But, difficulties that follow for an independent designer respectively for the automatic use in terms of a universal manual, is chemistry. If a designer is not also a good chemist, it is impossible to master the whole process successfully without an external cooperation.

The term of biomimicry was popularized by scientist and its author Janine Benyus in her 1997 book *Biomimicry: Innovation Inspired by Nature*. Biomimicry is defined here as a "new science that studies nature's models and then imitates or takes inspiration from these designs and processes to solve human problems". Benyus suggests looking to Nature as a "Model, Measure, and Mentor" and emphasizes sustainability as the objective of biomimicry. "Biomimicry is the examination of nature, its models, systems, processes, and elements to emulate or take inspiration from in order to solve human problems." <sup>3</sup>

Biomimicry is an original way of ecodesign implementation, as far as we are looking for new ideas and suggestions. But, it is a complex way that requires the design and prototyping during its methodical examination and testing, which is time consuming and expensive. This concept is not universal under conditions of our university design departments. This method would probably become difficult to verify at semestral works, but it is really very good way for a design inspiration.

## 2 Use of existing procedures in design process

It is obvious, that the generally applicable procedures, concepts and methods for the implementation of ecodesign represent separate manuals for the processing of ecodesign project. Each one has a great potential and they evidently work. There are many other methods, tools and processes how to make environmentally friendly design. Unfortunately,

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<sup>2</sup> Braungarth, m., McDonough, W., *Cradle to Cradle: Remaking the Way We Make Things*, North Point Press, 2002, 208p.

<sup>3</sup> Benyus, M., J.: *Biomimicry: Innovation Inspired by Nature*, William Morrow Paperbacks, 2003, 208p.



most of them are very difficult to apply in a common design student use. Existing methods often include advanced and complex methods that require large vocational experience. They do not respect national traditions and the scheme of education applied at our universities. They also do not take in account the fact that designers often have their "own" way how to approach sustainability of a product by its design.

The flow of information about basic environmental knowledge in the academic world of industrial design is very limited. Even where it is available is not often used. Students do not know where to find relevant information on ecodesign and resources that would be easy to use for quick understanding of the important relationships. Collecting the necessary data is time consuming, so students used to create ecodesign only on the basis of partial information, or their own "methodology" that have no solid ground.

The question is to what extent it is necessary that a student should be able to process each step of implementation independently, including assessing the impact of some materials mining on the environment, or the issues of marketing and transport. Moreover, if the student did not propose a product directly to the company which has some kind of cooperation with a university, the relevance and accuracy of some steps will be unprovable and unverifiable.

Literature, research projects and our own experience with teaching ecodesign together with our experience as industrial designers of furniture show that many existing tools fail, because they are not directly focused on the design. They focus on strategic management or retrospective analysis of existing products. Some methods are proposed primarily for the enterprises where a team work is expected.

The objective of our research project is to create a simple and as much universal as possible manual for the implementation of environmental practices in the process of design. It will be proposed primarily for the students of design. We intend to set up a fully functioning prototype of ecodesign tool for the implementation and dissemination of ecodesign in practise. It will work as an online web portal available for students, as well as for experts and larger public. The portal should help students and designers to acquire basic knowledge of the related field in order to be able independently automatically assert known integrated ecodesign practices into their work.

### **3 Need for integration of Ecodesign in the educational process**

Since an industrial designer is the creator of the environment in which we live, it is very important to try to set up the inovated conditions of his or her education. There is need to change these conditions so that during the study years of future designers the primary information about the environmental principles of designing will be introduced in their way of thinknig and the approach to their own work. The acquired knowledge then should be used in their practice systematically like a mathematical multiplication.

During a semester, students have to respect the particular criteria of designing, such as ergonomics, construction, economy, suitable target group of consumers, or an appearance. The analysis of environmental impacts of the product as a part of ecological design criteria should be not only formal, but a really substantial part of their semester work done in at a compulsory Design Studio. Unfortunately, it is not the case of the most of semestral projects.

The study of industrial design in our country comes mainly from the Central-European tradition, which focuses on the quality of education in a design technology, drawing, CAD, the history of art and current trends in design.

Each university which deals more or less with the design is the user of its own individual principles and local procedures for a certain creative development in the all stages of design. For a student as a future designer, as well as for a teacher as an active designer, it is



extremely important the confrontation of different views on the solving current problems and exchange of informations. It should be noted a fact that in Slovak higher education in the field of design, there is no relevant integration of ecodesign approaches to education in the Design Studio. There are some particular unique projects on the topic of "eco". It concerns some projects carried out at workshops, or some undergraduate and graduate theses. But these outcomes are generally more like a kind of a manifesto or the concept with authors own ecological ideas. They lack a systematic methodology and the verification of a real ecological potential of products with a complex material analysis, LCA, or by designing the whole manufacturing process and its impact on the environment.

However such a procedure of "designing" products in this way requires certain knowledge and involvement from the position of a teacher and also of a student, as well. Departments focusing on design at present are due to objective reasons unable to implement environmental principles of designing well into the consultations of student's semestral projects provided by teachers.

If the integration of ecodesign practices is included into semestral projects and later on in practice by young designers, obviously students have to be trained in this area at least by external consultants. Either students should provide teachers with feed-back information or they would be systematically educated. Lectures should start with basic ecodesign information concerning the environmental aspects of designing and then provide the necessary consultation for strengthening the ability to work independently. Similarly, the existing methods of environmental analysis and ecodesign tools would be available for a student. He himself would be able to select and choose procedures to enhance his own environmental analysis and its impact on an assumed product. Since we live in the 21<sup>st</sup> century, it can be expected the pressure of production companies on universities to educate their graduates also in a complex eco-design field, in the next decade.

#### **4 Developed methodology concept**

The interviews with students revealed the fact that to assert ecological and environmental criteria in their design works is very demanding. They lack a comprehensive, clear and simple guidance. They need a short, quick, concise and attractive manual, which could be used as a basis for their projects and assignments. Strictly speaking, students need a manual that would combine information and clear instructions for ecodesign implementation into their own work. This type of instructions how to operate the ecodesign tool would allow a designer to select such a creative approach that correspond the best to his or her artistic identity.

As it has been explained, the objective of our research project is to create a web portal which would constitute the prototype of a new ecodesign tool suitable for students of BC / MSC level and independent designers, as well. The educational portal should carry out four basic functions:

1. To convey basic professional information on both the ecodesign and the environment.
2. To provide informations about existing ecodesign tools, concepts, software for assessment of LCA and methodology in a simplified form for improving the environmental profile of the product. (Student who meets the design requirements for the first time will have the opportunity to try different methods with their known advantages and disadvantages.)

3. To inform about existing technologies and materials that are suitable or unsuitable for application from the environmental impact point of view. The objective of research also should be to gradually build a database of sustainable materials, their technical and environmental properties and possible applications in projects of students.
4. To provide students with a simplified sequence of steps that should lead them at the solution of any assignment.

In the proposal of simplified sequence of steps (4) for ecodesign project we would like to draw the attention to the implementation of these steps that are important for the student of design during the stage of concepts development. These steps then customize to students needs.

We intend to involve in our research experiment many students of design attending both the Slovak and Czech universities. This can increase the objectivity of assumed results. However, the portal should be available not only in Slovak but also in English, that can extend its influence also on foreign students.

The use of the assumed ecodesign tool will not replace the role of teacher as a consultant of semestral task. The ecodesign portal as a tool for ecodesign implementation can only help students to make their semestral projects meet the required environmental criteria.

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# THE THIRD ROLE OF UNIVERSITIES AND ITS BENEFITS IN THE WOODWORKING INDUSTRY

*Andrea Vadkertiová*

## **Abstract:**

Cooperation with universities, industry is currently at an unsatisfactory level. Interactions between science and industry practices are marked by a number of constraints on universities and businesses. The paper deals with possibilities of cooperation and the university sector enterprises in the wood processing industry, with emphasis on knowledge transfer and commercialization, which are the creators of the university. Describes the latest forms of cooperation between these entities and provides opportunities for better cooperation between universities and enterprises in the future.

## **Key words:**

university, knowledge transfer, cooperation, woodworking industry

## **1 Introduction**

Woodworking industry in Slovakia is one of the most dynamically growing industries in the EU. At present its share of total sales is approximately 10% of the manufacturing industry and it is expected that it will grow in the future.<sup>1</sup> This type includes several industry sectors, each one of the sectors has a significant impact on the performance of others. Deep knowledge of the nature of these interdependencies, make the ability to translate and analyze these impact on corporate, cluster and community level. The understanding of these interdependencies takes important part in wood processing industry. If we want to have this sector modern and innovative, we must adapt to new trends and not to be afraid of collaboration with other organizations as universities and various research institutes. The creativity is closely linked to innovation. In today's world we cannot compete with low labor costs, but we can compete with ability to transfer knowledge into practice, to create the greater added value, to build and to develop the knowledge economy.

The industrial plants for the wood processing industry therefore need to collaborate with universities in research and development, and in lifelong trainings, in mobility of teachers and students of other academic fields. Based on these characteristics the university is one of the most important actors in the knowledge society and in a practice area such as the woodworking industry.

## **2 The traditional role of universities**

The activities of universities are practically implemented in the form of "tasks" of universities. The traditional role of universities is well known and has been modified since the Middle Ages. The basic tasks of universities are to educate and to produce research activities.

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<sup>1</sup> [http://www.vedavyskum.sk/lesnicko\\_-\\_drevarsky\\_komplex/drevospracujuci\\_priemysel](http://www.vedavyskum.sk/lesnicko_-_drevarsky_komplex/drevospracujuci_priemysel)

Educational role of universities is to produce educated graduates who are qualified human capital. Human resources are considered as the main source of creativity and innovation. University through education produce university-educated graduates of all study levels. In this context is important to note that every educational institution has its educational programs and courses that suit the practical needs of university graduates to help them facing to practical applications. The implementation of education universities generate intellectual wealth, which, according to Stephen<sup>2</sup> (in Beer, Cooper, 2007) can be commercialized and which ultimately creates new businesses and industries.

Research is another key role of universities. Researches of universities, in the field of wood processing industry in Slovakia, are mainly carry out through research projects funded by the agriculture sector, Agency for Research and Development (ASRD), by project of the Scientific Grant Agency (VEGA), by scientific and technical collaboration, by applied research, by the Ministry of Education, and links for educational activities and projects through the Cultural and educational grant Agency (KEGA) and by development projects of the Ministry of Education. On our local universities are currently dominated by basic research, while applied research is mainly used in companies or research institutes. The world's leading universities, however, give more attention to applied researches and to innovative and creative ways of teaching and services for customers as public and private sector. To actively link between academia and the business sector is one part of the "new" role of universities.

### 3 New - the third role of universities

The need for transfer and diffusion of knowledge between university institutions and industry in recent years become increasingly evident. In the past, research institutions were perceived as a source of new ideas and industry offered a natural way to make the best use of these ideas. Several experts, however,<sup>3</sup> agree that in recent years the roles of both parties have changed significantly. The university in its relationship with industry must play a more active role in collaboration, so that it can maximize the use of its research results into practice and improve its financial situation.

The effective collaboration with industry is the third major role of universities Kuzmišín<sup>4</sup> sums already mentioned roles of universities in the following areas:

a) in the area of education, the system develops and fully uses the potential of individuals, prepares young people for the entry to the labour market and in the long-run provides for their employability, provides education of active citizens striving for building a democratic society, supports graduates on their way for further education and life-long learning and further develops knowledge in wider array of courses,

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<sup>2</sup> in BEER, A., COOPER, J.: *University – Regional Partnership in a Period of Structural Adjustment: Lessons from Southern Adelaide's Response to an Automobile Plant Closure*. European Planning Studies, Vol.15, No. 8, September 2007. ISSN 1469-5944

<sup>3</sup> ALI TAHA, V., TEJ. J.: *Potreba univerzít v znalostnej spoločnosti pri rozvoji regiónov*. S. 9-20. Available from: [http://www.uniregio.fvs.upjs.sk/pdf/zbornik/AliTaha\\_Tej.pdf](http://www.uniregio.fvs.upjs.sk/pdf/zbornik/AliTaha_Tej.pdf)

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<sup>4</sup> KUZMIŠÍN, P.: *Triad: businesses – universities – municipality (regions) within knowledge economy*. In: QUALITY INNOVATION PROSPERITY XIII/2 – 2009. p. 20-35 ISSN 1335-1745. Available from: [http://www.qip-journal.eu/files/2009/2009-2/QIP\\_2\\_2009\\_Kuzmisin.pdf](http://www.qip-journal.eu/files/2009/2009-2/QIP_2_2009_Kuzmisin.pdf)

b) in the area of R&D, universities create appropriate conditions for the development of R&D on the top level, spread the results of R&D or they apply them in practice as a significant source of innovations,

c) universities co-operate with business sector (businesses, employers, and other clients), they contribute to establishing innovation and technological partnerships and influence within the regional development, where they are active.

The cooperation of universities with industry takes different forms. Forms of cooperation between universities and enterprises can be divided, in terms of the existence of intermediary article cooperation between these actors, to direct and indirect. The direct forms of cooperation may include activities in which universities and their employees are directly engaged in communication with representatives from the business sector. This form of cooperation is in the form of tasks related to the creation and implementation of various projects as a contractual joint research, advisory and consultancy services, organization and participation in professional conferences, symposia, exchanges, seminars, joint creation of scientific textbook articles and publications, creation of joint research centers, universities and business, science and research parks, consortia, business incubators, and consulting services and the like. In many cases this form of cooperation is given by informal contacts and friendly relations between different actors. Indirect forms of cooperation with universities and the business sector have intermediate article, which can take the form of institutions, information portals or persons involved in managing cooperation and sharing information between each entity cooperation and community environments.

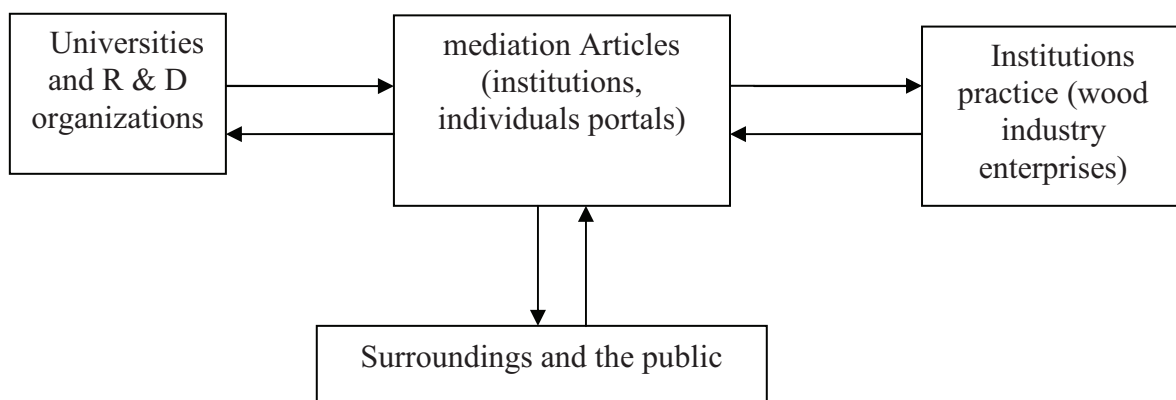


Figure 1: Schematic representation of indirect forms of cooperation between universities and industry (custom processing)

The activity of the University may initiate and promote the region's development through the creation of knowledge, human capital, transfer of existing know-how, technological innovation, capital investment, regional leadership, knowledge production infrastructure.<sup>5</sup> Other tasks of universities, that are currently important in connection with its environment,

<sup>5</sup> VÝROSTOVÁ, E. - VÝROST, T. *Možnosti merania vplyvu univerzity na regionálnu ekonomiku*. In: Teória a prax verejnej správy, Zborník príspevkov. Košice: UPJŠ. 2009. ISBN 978-80-7097-736-1

include particular social, educational and social role, expert work, development and building regional innovation networks.<sup>6</sup>

#### **4 Creating the conditions for application of the third role of universities**

The role to create partnerships between industry and universities is long and complex but its effect is beneficial for both parties. In the past, universities collaborated with industry in certain contractual relationships, but mainly with big companies in which students deal with their theses or the cooperation was based on research activities. Today the situation has been changed. Most of the former companies have disappeared and new have existential problems. The EU Commission in its broad-based innovation strategy for the EU<sup>7</sup> underlined importance to improve knowledge transfer between public research institutions and organizations including third sector and civil society as one of ten key areas where action is needed.

For this reason in recent years many leading European research institutions have set up knowledge transfer centers which have to improve cooperation and utilization of research results and their uptake by business. Although the number of Slovak universities have already created offices and centers, whose role is to transfer knowledge into practice and to seek incentives for cooperation. This new role requires specialized personnel who is able to identify and manage sources of university knowledge with business potential. Achievements of the workplace depends largely on the skills and competencies of their employees, as well as the strategic role assigned to them and to their managerial autonomy. Employees who work on knowledge transfer must possess a wide range of skills to effectively perform their tasks. These sites are often appointed by relatively inexperienced staff with minimal experience. Our universities usually do not have specialist staff who would be able to professionally assess the commercial potential of scientific knowledge, in other words to determine whether the new product is commercially exploitable, how to present it on the market and ensure adequate resources for its implementation to achieve a reasonable profit for all parties and the like. For this reason, one of the leading European associations active in knowledge transfer - PROTON Europe<sup>8</sup> is trying to develop a system of accreditation for the current officials involved in knowledge transfer based on their experience and results.

For a more effective transfer of knowledge must be research institutions sufficiently independent to recruit skilled employees working in knowledge transfer on a competitive basis.

#### **5 Conclusions and recommendations for the University**

Interactions between the university research base and industry in recent years are increasing. This interaction can range from contract research, to cooperative research, or even to structured partnerships. Most forms of interaction deals with the transfer of

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<sup>6</sup> VALENČÁKOVÁ, E., ŽIGOVÁ, S.: *Úloha univerzít v regionálnom rozvoji*. [CD] In: „New members – New Challenges for the European Regional Development Policy. Nový Smokovec, 2005. p. 435-444. ISBN 80-225-2060-8.

<sup>7</sup> EÚ: *Uvádzanie poznatkov do praxe: Všeobecná inovačná stratégia pre EÚ* – COM (2006) 502.

<sup>8</sup> <http://www.protoneurope.org>



knowledge between the parties and enhance the socio-economic impact of research funded from public sources, such as creating new useful products, new jobs and sometimes new companies. Especially in the wood processing industry has been widely used obsolete technologies and production processes and for all that is needed to apply for new accesses in cooperation and development. Universities and business partnership has undeniably positive impact not only on product and process innovation, but also on the formation and growth of human capital.

Our goal is to design activities aimed on developing functional relationships and links with academia with private and public sectors. Therefore for the university departments we propose the following activities:

- Create a university degree programs oriented to the needs of public and private sector
- Support the creation of academic research teams focused on the needs of your surroundings, including private sector
- Support various approaches of "creative commons" (open access, open publications, open source software) where are opportunities to do it
- Organize events (conferences, seminars, courses, workshops, etc.) aimed at networking academia with the private sector
- Support commercial activities in research and development (licensing, sale of patents, innovation vouchers, counseling)
- Allow to exist the entrepreneurial university, which is typical for the commercialization of its own research activities and proactive approach to economic development at national and regional level.
- Promote the establishment of discussion platforms for interaction between research needs, private and public sector
- Connect with international cooperation projects in research and development in the cohesion on regional development (formation of and participation in clusters)
- Conduct regular audits of university intellectual property and organize training courses how to protect intellectual property rights for researchers and for the public
- To promote and legislate change conditions for the growth and the mobility of students, academics and researchers in industry.

These tasks are only a fraction of the activities that our universities should actively pursue. Successful implementation of an innovative model of knowledge transfer in the environment of the wood processing industry is a major challenge. This policy brings additional income for universities, what is not today a negligible fact. If we accept the claim that one role of universities is to support social and economic benefits for society, then the existence of a policy based on mutual cooperation with industrial companies operating in the wood processing industry as an urgent requirement for present and future.

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# CROWDSOURCING – INVOLVEMENT OF SOCIAL MEDIA IN THE FURNITURE INDUSTRY

*Norbert Vrabec*

## **Abstract:**

Internet and especially social media brought the possibility of involving innovative forms of cooperation between firm and customers. These models are not limited to marketing processes, often are based on the open source philosophy and use creative power a potential of internet-scale community. Marketers and innovation managers in every industry sector, especially if focusing on retail customer, should exploit the opportunities of collective creative power hidden in the crowd. The paper deals with the possibilities of crowdsourcing - a relatively new phenomenon in which on-line volunteers, or freelancers complete various tasks in the development of a new product, their design, or innovation solutions useful for open innovation process, especially in the furniture industry.

## **Key words:**

crowdsourcing, open innovation, co-creation, community-based design, collective intelligence, internet cooperation, crowd

## **1 Introduction**

The term "crowdsourcing" is derived from the words "crowd" and "outsourcing". First time this phrase was used by Jeff Howe in a June 2006 in his article published in the Wired magazine. Under this term he means a distributed problem-solving and innovation model that involve amateurs or volunteers working in their spare time to solving various tasks, especially online. The key difference between crowdsourcing and outsourcing model is that a task or problem is outsourced to an undefined members of the crowd rather than a consulting firm, or other professional provider of outsourcing solutions. *"Hobbyists, part-timers, and dabblers suddenly have a market for their efforts, as smart companies in industries as disparate as pharmaceuticals and television discover ways to tap the latent talent of the crowd. The labor isn't always free, but it costs a lot less than paying traditional employees. It's not outsourcing; it's crowdsourcing"*.<sup>1</sup> The point is that the company announces the open call published in specialized on-line portals. Consequently, this challenge can respond volunteers, freelancers, experts or small businesses interested in the delivery of solutions.

Businesses grew up in the Internet age can benefit from enthusiasm of the crowd and also exploit creative potential latent in their consumers, moreover, in conjunction with significant cost savings. But should be noted that crowdsourcing is not only associated with low cost and looking for cheap labor. Crowdsourcing is also considered a tool for innovation. If applied correctly, can accelerate marketing and innovation power of entrepreneurs and also change the traditional innovation model. Open innovation platforms are a very effective way of crowdsourcing people's thoughts and ideas to do research and development. *"The traditional innovation process is sequential: developing concepts and testing them, mostly internally or with a small network of external agents. It takes up a significant amount of time*

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<sup>1</sup> HOWE, J.: *The Rise of Crowdsourcing*. In.: WIRED [online]. 2006 [cit. 2012 06.06]. Available at <http://www.wired.com/wired/archive/14.06/crowds.html>

and has a high failure rate. Consumers are involved at the tail-end, as validators.... Co-creation engages consumers directly at the onset of the innovation process to gain fresh, fast and creative ideas that are consumer-rooted, streamlining and compressing a complex chain of ideation-validation steps with multiple stakeholders. When it happens online, it enables simultaneous engagements with a large number of individuals across geographies within a short timeframe.”<sup>2</sup> Crowdsourcing allows people from all aspects of business such as investors, designers, inventors, and marketers to participate into open innovation processes that can bring together stakeholders from different parts of the world and different sectors to work together on a common idea, product or project.

One of the key components of this model is that it relies on a large group to influence development of an idea. Its supporters believe collaborative input is more valuable than the limited knowledge that exists within the heads of a company's employees. The popularity of such collaborative models hinges on transparency and fostering an ongoing dialogue with customers and supporters.<sup>3</sup> The use of this phenomenon is very wide. If company looking for a design of new product, can announce an open call for a crowd of designers and then choose one of the best solutions, which is offered. Crowdsourcing can also be used to get designs for furniture, packaging, developing new materials, product design, software, or to generate and collect scientific data. There are many other potential uses that allows businesses to submit problems in which on-line contributors can work on.

## 2 Crowdsourcing from differing points of view

There are a variety of definitions which look at crowdsourcing from differing points of view. One of the most accurate definition brings Arolas and Guevara under which the “crowdsourcing is a type of participative online activity in which an individual, an institution, a non-profit organization, or company proposes to a group of individuals of varying knowledge, heterogeneity, and number, via a flexible open call, the voluntary undertaking of a task. The undertaking of the task, of variable complexity and modularity, and in which the crowd should participate bringing their work, money, knowledge and/or experience, always entails mutual benefit. The user will receive the satisfaction of a given type of need, be it economic, social recognition, self-esteem, or the development of individual skills, while the crowdsourcer will obtain and utilize to their advantage that what the user has brought to the venture, whose form will depend on the type of activity undertaken.”<sup>4</sup>

Crowdsourcing is based on the idea that a group of people is often more intelligent than an individual. This idea of collective intelligence proves particularly effective on the web because people can contribute in real-time within the same forums from very diverse backgrounds. Open innovation platforms are a very effective way of crowdsourcing people's thoughts and ideas to do research and development. For example, InnoCentive.com is a one of the largest crowdsourcing platform for corporate research and development where difficult

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<sup>2</sup> PÉTAVY, F.; CÉRÉ, J.; TAN, CH.; ROTH, Y.: *Online Co-creation to Accelerate Marketing & Innovation*. [online]. eYeka, 2012. p.3 [cit. 2012 06.06]. Available at [http://cocreationforum.com/net/sites/default/files/eYeka\\_White-Paper-Online-Co-Creation-to-Accelerate-Marketing-Innovation.pdf](http://cocreationforum.com/net/sites/default/files/eYeka_White-Paper-Online-Co-Creation-to-Accelerate-Marketing-Innovation.pdf)

<sup>3</sup> COHEN, D.: *Entrepreneurs run with crowdsourcing model*. In.: REUTERS [online]. 2010 [cit.2012 06.06]. Available at <http://www.reuters.com/article/2010/07/28/us-cohen-column-crowdsourcing-idUSTRE66R40W20100728>

<sup>4</sup> AROLAS, E.; GUEVARA, F.: Towards an integrated crowdsourcing definition. In.: *Journal of Information Science*, 2012. Vol. 38, No. 2, pp. 9-10. Print ISSN: 0165-5515

scientific problems are posted for crowds of solvers to discover the answer and win a cash prize.<sup>5</sup> Crowdsourcing can be seen most frequently as effective way for entrepreneurs to access external knowledge or collect valuable data and creative proposals. The crowd also can be used to provide inspiration for internal staff of company, or for new marketing and sales ideas.

Especially for small and medium-sized firms is prohibitively expensive to employ a range of specialists. Work on specific contracts is more and more about specific projects, where specialists are applied to solve various specific problems.<sup>6</sup> Crowdsourcing phenomenon is also considered a tool for innovation cooperation and consumer's participation. The motivation for such activity can be not only monetary or material prizes. "...there are both intrinsic and extrinsic motivations that cause people to contribute to crowdsourced tasks, and that these factors influence different types of contributors. For example, students and people employed full-time rate Human Capital Advancement as less important than part-time workers do, while woman rate Social Contact as more important than men do."<sup>7</sup> People who contribute to crowdsourcing efforts can receive satisfaction by developing their own skills, social recognition in the community, increase self-esteem, or may simply be a form of expression of sympathy to the brand or interesting idea.

In accordance to study of company eYeka, on-line consumers could be divided into a ratio of 90:9:1. This concept first introduced Jakob Nielsen, principal and co-founder of the Nielsen Norman Group<sup>8</sup>. There are identified three basic groups of customers:

- **90%** of consumers are deemed "spectators". They read or watch but do not contribute. They are good at talking about their experience with products and identify problems. This is the group traditionally involved in focus groups or consumer research.
- **9%** of consumers are termed "enthusiasts" who actively view, share content and interesting ideas, yet do not create from scratch.
- The remaining **1%** is "creative consumers". They have superior creative thinking capability and create content actively of which the remaining 99% view and share. They are not necessarily representative of a target audience of a given brand they are working on, but they have the ability to come up with innovative solutions and messages that will resonate with them.<sup>9</sup>

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<sup>5</sup> BRABHAM, D.: Crowdsourcing as a Model for Problem Solving: An Introduction and Cases. In.: *Convergence: The International Journal of Research into New Media Technological Studies*, 2008. Vol. 14, No. 1, pp. 75-90. Print ISSN: 1354-8565

<sup>6</sup> VRABEC, N.: Co-working center: a tool to promote independent professionals in the academic environment. In.: *Modern educational methods in teaching marketing communications within the tertiary education*. Praha: University of Finance and Administration, 2011. (DVD) ISBN 978-80-7408-055-5

<sup>7</sup> KAUFMANN, N; SCHULZE, T; VIET, D.: More than fun and money. Worker Motivation in Crowdsourcing – A Study on Mechanical Turk. [online]. In.: *Proceedings of the Seventeenth Americas Conference on Information Systems, Detroit, Michigan August 4th-7th 2011*. 11 pp. ISBN: 978-0615507071 Available at [http://schader.bwl.unimannheim.de/fileadmin/files/publikationen/Kaufmann\\_Schulze\\_Veit\\_2011\\_-\\_More\\_than\\_fun\\_and\\_money\\_Worker\\_motivation\\_in\\_Crowdsourcing\\_-\\_A\\_Study\\_on\\_Mechanical\\_Turk\\_AMCIS\\_2011.pdf](http://schader.bwl.unimannheim.de/fileadmin/files/publikationen/Kaufmann_Schulze_Veit_2011_-_More_than_fun_and_money_Worker_motivation_in_Crowdsourcing_-_A_Study_on_Mechanical_Turk_AMCIS_2011.pdf)

<sup>8</sup> NIELSEN, J.: *Participation Inequality: Encouraging More Users to Contribute*. In.: Jacob Nielsen's Alertbox [online]. 2006 [cit.2012 06.06]. Online ISSN: 1548-5552 Available at [http://www.useit.com/alertbox/participation\\_inequality.html](http://www.useit.com/alertbox/participation_inequality.html)

<sup>9</sup> PÉTAVY, F.; CÉRÉ, J.; TAN, CH.; ROTH, Y.: *Online Co-creation to Accelerate Marketing & Innovation*. [online]. eYeka, 2012. 24 pp. [cit. 2012 06.06]. Available at



### 3 Examples of successful implementation in the furniture industry

On the other hand, there are many reasons why enterprises should make use of these participation models to rise tasks, find new design solutions, or to gather valuable information. These include the ability to offload peak demand, access cheap labor and information, generate better results, access a wider array of talent than might be present in one organization, and undertake problems that would have been too difficult to solve internally.<sup>10</sup> All these properties are a valuable asset in the hands of managers who value alternative open innovation strategy and they can take advantage of the networked world. Suitable examples can be found in the furniture industry or other sectors, where designers are involved. Instead of creating a furniture design proposals on their own, hiring freelance or self-imposed designers, producers can give a crowd the opportunities to create the proposals on their own. *“Current employment strategies usually rely on some rational compromise between hiring people with skills that are needed immediately and hiring people with skills that will likely be needed in the future. A more open approach to innovation promises access to “smart people” that are outside of your organization.”*<sup>11</sup> In this process plays a vital role especially the quality of the educational process, particularly the training of future marketers and innovative managers.<sup>12</sup>

There are several examples of successful implementation of this model in the furniture industry. We can refer to a case study about Galatea, Brazilian furniture company that allows customers to vote browse a range of products and vote for their favourite items. Those pieces of furniture that garner the most votes are selected for production. Customers who voted for particular items are given a discount off them once they roll off the production line. This crowdsourcing business model is also a boon to designers who are able to see which designs are popular with the public. This crowdsourcing concept is helping to transform the relationship between retailer and consumer. From simple customizing of colours or styles to building products from scratch, crowdsourcing can offer a wealth of opportunities for all players.<sup>13</sup>

Another example relates to the company Made.com from Great Britain. This company operates a specialized e-shop where promote fresh ideas in furniture design that match its customers' sense of style. The site is designed to allow new designers, who may find it difficult to get the attention of buyers elsewhere because of their lack of reputation, to post their designs up for customers to see.<sup>14</sup> Made.com gives designers the opportunity to submit ideas and then asks customers to vote on them. Only the top vote getters are offered for sale. The term crowdsourcing is only a few years old, but the idea's been around for a decade.

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[http://cocreationforum.com/net/sites/default/files/eYeka\\_White-Paper-Online-Co-Creation-to-Accelerate-Marketing-Innovation.pdf](http://cocreationforum.com/net/sites/default/files/eYeka_White-Paper-Online-Co-Creation-to-Accelerate-Marketing-Innovation.pdf)

<sup>10</sup> NOVECK, S.: *Wiki Government: How Technology Can Make Government Better, Democracy Stronger, and Citizens More Powerful*, Washington, DC: Brookings Institution Press, 2009. 224 pp. ISBN: 978-0815702757

<sup>11</sup> BINGHAM, A. ; DWAYNE, S.: *The Open Innovation Marketplace: Creating Value in the Challenge Driven Enterprise*. Southlake: InnoCentive, 2011. pp. 39 ISBN: 978-0132311830

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<sup>13</sup> PAUL, A.: *Furniture Store Uses the Crowd to Select Products Ranges*. In.: IdeaConnection Blog [online]. 2012 [cit.2012 06.06]. Available at <http://www.ideaconnection.com/blog/2012/03/store-uses-the-crowd-for-product-range/>

<sup>14</sup> GOLDSMITH, J.: *Made.com: Crowdsourcing Furniture Stocks*. In.: CBS News [online]. 2010 [cit.2012 06.06]. Available at [http://www.cbsnews.com/8301-505125\\_162-39040814/madecom-crowdsourcing-furniture-stocks/](http://www.cbsnews.com/8301-505125_162-39040814/madecom-crowdsourcing-furniture-stocks/)



Made.com typically accepts submissions only from Professional designers, although customers can send in sketches as well. It attracts 50 to 100 designs monthly. For every 100 submissions, about 10 go to a public vote, and just two or three end up for sale.<sup>15</sup>

Made has taken the traditional process of designing furniture and converted it into an interactive experience that removes showrooms, warehouses, and additional expenses. The company is able to cut out the middlemen of purchasers, designers, manufacturers (most pieces are made in China), importers, shippers, and salespeople. This method allows the company to bring good quality pieces to their customers for 50%-80% less than traditional retail stores. The designs are submitted gratis, but if a design is chosen to be produced, the designer gets 5% of the sales.<sup>16</sup>

## 4 Conclusion

In the Internet age and ever wider expansion of social media crowdsourcing plays a key role in the deeper integration of the businesses and their customers. There are many broad success factors of this model, but it is important to have a relevant topic interesting both for managers and for crowd participants. It is a mistake to consider crowdsourcing only as marketing or advertising activities. In the first place crowdsourcing projects should provide satisfaction of individual and social needs of online participants. Without meeting this condition, firms cannot count on success. On the other hand, well-planned and carefully prepared project brings many advantages, not only in marketing field, but also in cutting costs and bringing changes to innovative processes.

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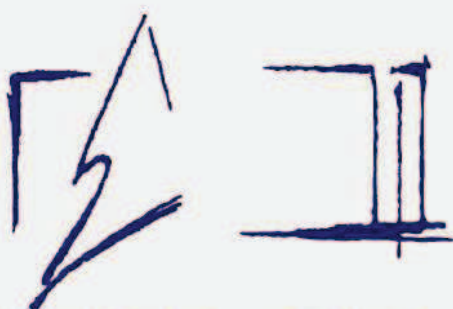
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