



WOODEMA, i. a. - International Association for Economics and Management in Wood Processing and Furniture Manufacturing



University of Zagreb, Faculty of Forestry



Department for production organization

Competitiveness of wood processing and furniture manufacturing

Šibenik, Croatia, 2009.



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and Management in Wood Processing
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Proceedings

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P R E F A C E

This proceedings is compilation of papers given by authors as results of their research conducted recently. This papers were presented at the international scientific conference titled COMPETITIVENESS OF WOOD PROCESSING AND FURNITURE MANUFACTURING, held in Šibenik, Croatia on October 7th-9th 2009. Main organizer of the conference was WoodEMA,i.a.

The main goal of the conference was to exchange and transfer knowledge of international experts and scientists regarding competitiveness of wood processing and furniture manufacturing enterprises. Scientists and experts from 9 European countries and United States of America presented their point of view to organisation, economics, marketing, trade and environmental issues which are important in the market competition of each company.

Global problems, recession, financial breakdown and other global problems put wood processing and furniture manufacturing into very bad position on the market, so transfer of knowledge was intended to help in every possible way.

This was second WoodEMA conference in a row and hopefully one of the many to come. We hope next year we will be able to see some improvement achieved as a result of implementation of the knowledge tranfered at this conference.

October 7th 2009

For Organization Board:
Assoc. Prof. Denis Jelacic, PhD.
WoodEMA secretary
University of Zagreb
Facutly of Forestry
Department for production organization

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Chapter 1.

TRADE AND MARKETING

NEW VISUAL IDENTITY OF WOOD FLOORING FROM SERBIA IN FUNCTION OF INCREASING THEIR COMPETITIVENESS IN EXPORT TO THE EUROPEAN UNION MARKET

Branko Glavonjić, Milan Nešić, Slavica Petrović

Abstract:

The paper¹ shows the results of researching the development and usage of the new visual identity for wood flooring exported from Serbia onto the European Union market. Market analysis of the most important countries into which wood flooring from Serbia is exported shows that it is unrecognizable and without any features which could influence the consumers to decide for flooring produced in Serbia when purchasing. It is expected that with the development and usage of the new visual identity of flooring produced in Serbia, demand for it on foreign markets will increase, which is significant both for exporters and for Serbian foreign trade balance.

Key words: visual identity, wood flooring, export, market.

1. INTRODUCTION

Wood flooring usually covers the largest area in working or living space and at the same time it is the healthiest kind of flooring, both physically (wood is environmental and antiallergic material which binds CO₂) and psychologically (its unique and “warm” natural structure relaxes). Most European Union residents do not see wood only as a material necessary for paneling but as “the first furniture in a room”. Equipping of an interior in which one spends time starts with the selection of wood flooring type, wood colour, dimensions and laying model. Therefore, one of the tasks of visual identity development and usage program for wood flooring is to send the message to the consumers in European countries that they have made a good choice by purchasing “the real furniture” produced in Serbia.

2. RESEARCH SUBJECT AND AIM

Wood flooring produced in Serbia is the subject of the research in this paper and in line with that its recognition on the markets of the EU countries to which it is exported. In the conditions of tough competition when a lot of producers of extremely good quality wood flooring are present on the market, it is necessary to create product recognition which should contribute for the consumers to decide to buy exactly this product type from Serbia. Therefore, the main aim of this paper is the analysis of the impact of the new visual identity of wood flooring produced in Serbia on its competitiveness in exporting onto the European Union market.

3. METHOD OF WORK

For the purpose of the research in this paper, the method of analysis of available information and literature sources on Internet sites of wood flooring producers, associations and certain Government institutions in several European Union countries and the surrounding of Serbia was

¹ This paper supported by Ministry of Science and Technological development of Republic of Serbia.

selected. In that sense, the research included a lot of Internet sites of the biggest European wood flooring producers, producer associations and chambers of commerce as well as the national programs in certain European Union countries of size similar to Serbia.

Beside the analysis method, also synthesis and generalization methods as separate scientific methods were used for the needs of the research. Among general scientific methods, the method of inductive-deductive concluding was used.

4. NEEDS FOR THE DEVELOPMENT AND USAGE OF VISUAL IDENTITY OF WOOD FLOORING FROM SERBIA

Wood flooring belongs to the group of products of special national importance for Serbia because it represents products with higher added value, with dominant participation of domestic inputs, which realizes positive foreign trade balance and for which there is a long-term expressed demand on the markets of the developed countries.

The quality of wood raw material in Serbia (first of all oak, beech, hornbeam, locust, ash and maple) which wood flooring is made of is satisfactory from the point of foreign markets. What is more, foreign buyers accept wood flooring (first of all ship decking) also made of oak (*Quercus pedunculata*), which is much more present in Serbia than oak (*Quercus robur*).

Beside all that, wood flooring from Serbia has lower price and smaller demand (although the price is lower) because of its unrecognizability on the European Union markets than the products from other countries, and it is also characterized by the consumers' attitude as the products of lower value. Because of the lack of its own visual identity, wood flooring produced in Serbia is very often only a part of the assortment of big producers and distributors from the European Union countries.

Today it is not enough only to highlight the quality of wood flooring from Serbia through its technical characteristics, reliability, durability and wood species characteristics for success on foreign markets, it is necessary to allocate it a new visual identity which the consumers would recognize, single out and emotionally perceive compared to similar or the same flooring from other countries. Quality is an important component of wood flooring placement, but in the conditions of strong competition on foreign markets it is not sufficient, since the consumers have a possibility to choose good quality wood flooring from other countries as well.

By developing and using the new visual identity for wood flooring from Serbia, first of all the contribution will be made to its recognition on the markets of the countries in which it is exported and thus the increase of the demand for it and the effect of export for the companies that deal with the production and export of these products.

With this, a new message is sent to the consumers with the aim to create trust in them towards new symbols and products coming from Serbia and in that way to provide for an advantage of these products over the competitive products from other countries.

The development of the new visual identity of wood flooring from Serbia is a need and condition for the survival of domestic exporters on the markets of the Western European countries. With the new visual identity, wood flooring from Serbia will represent products with a new value which includes the elements of tradition in flooring production, elements of scientific research work and elements of modern trends in this area. In that sense, new visual identity will be the trade mark of quality and authenticity of wood flooring from Serbia.

Creation of new visual identity for wood flooring from Serbia is a strategic move which will brand Serbia with products of high quality and distinct visual identity in the sense of its position among the countries where the most contemporary tendencies in the area of interior equipping are followed.

5. CONCEPT, MEANING AND PERCEPTION OF VISUAL IDENTITY OF WOOD FLOORING

Inviolable rule of more and more demanding and choosy consumers is the main characteristic of the market today, they base their decision about buying a certain product or service on their inner motives which often result from numerous outer factors. Visual identity which products or services carry is often a crucial factor in creating positive or negative motives for consumers. If products or services prove to be of good quality and trustworthy, their visual identity remains remembered in consumers' minds as a confirmation that they have made a good choice.

Visual identity of a product is the first characteristic that every consumer notices. Visual identity means original and interesting idea solution which includes both product design and design of all accompanying material. Positive associations aroused by a well presented product are a good basis for gaining consumers.

Wood flooring is a specific product kind whose design is expressed and conceived in a special way. Unlike other products, design of wood flooring elements is to a certain extent defined and unchangeable because of the material itself used for their production and the conditions that have to be observed during laying. Flooring elements are always rectangular, sometimes square if mosaic parquet is produced, and the shape of the elements cannot be changed too much. Dimensions of flooring elements, first of all length and width are variable categories and different visual effects can be achieved with their combinations.

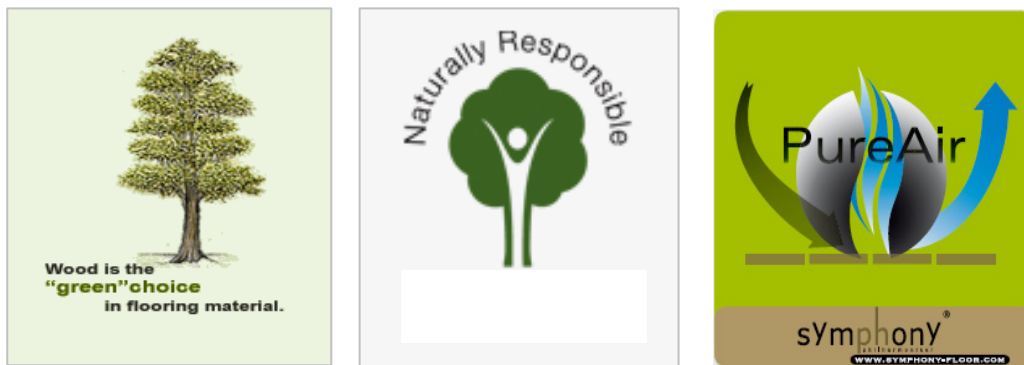
However, wood as a natural material gets the specific appearance of the texture during its growth. Texture and colour of the wood from which flooring elements are produced are also elements of their design. When talking about wood flooring design it is necessary to highlight that its effect is to a greatest extent achieved and applied on the laid flooring. The most different visual effects are achieved with variations in laying models of flooring elements, their dimensions, wood textures and colours and types of finishing, and different tastes of consumers are thus met as well. With the right combination of the stated elements, narrow space can be visually widened, elongated space can be shortened, small space can be enlarged and dark space can be enlightened.

However, most end users do not use these advantages of wood flooring. As a rule, many solutions offered by wood flooring are not presented to them and they are not aware of them so they act in a set routine and take idea solutions which do not represent the product in its best light in a specific space. This statement is confirmed by the practice that most consumers in their residential and business facilities lay the parquet in "fish bone" model, which is one of the oldest models for laying parquet and it does not allow the expressing of all effects which can be achieved with wood flooring. The creation of visual identity also means the development of new models for laying different types of wood flooring accompanied by adequate explanations in their distribution onto exporting markets. Thus, for every flooring type and its dimensions, colour and texture, models for their laying in rooms with different dimensions and different purposes would be offered.

6. MARKETING CAMPAIGNS FOR STRENGTHENING VISUAL IDENTITY OF WOOD FLOORING IN EUROPE – CURRENT SITUATION

National institutions and business associations in many European countries, and lately in the surroundings of Serbia, invest significant resources for developing visual identity and recognition of their products on the worldwide markets. Strengthening of visual identity based on which product recognition is achieved is realized, among other things, by using special marks and/or slogans which send certain messages to consumers.

Producers from developed countries do not have the need to highlight national characteristics and belonging when promoting and placing their products. Concerning high product quality and significant market share, they point out environmental component of the product (real wood), sustainability (FSC, PEFC, etc.) and the harmonization with the European safety directives (CE mark) when promoting their products. Since most of wood flooring producers in Europe works in accordance with the abovementioned principles and uses the marks of those principles, many of them have created their own marks with which they want to additionally highlight their individuality and achieve recognition of their products on the market (Picture 1).



Picture 1: Some of the marks of wood flooring visual identity of European producers

In many cases in Europe, producers use signs combined with a slogan but there are also numerous cases of using only a slogan for highlighting the product or campaign. The slogan which is a part of the visual identity of one of the most important wood flooring producer in Europe goes *Hard facts on hardwood floors*. This is one of the rare slogans where its meaning clearly and directly refers to the flooring made of hardwood species. Some of the slogans used by the producers from Europe mostly send general messages, somewhat provocative, which should associate consumers to wood flooring. Such are the following slogans: Interior dreams made in Germany, Walking on sunshine, What we make is what we are, For a quality future, A responsible choice, The individual diversity. The name of the company is always stated with the short slogans because of such their structure. Appearance and concept of promotional material for wood flooring produced in the European Union countries differs from country to country. It can be said that visual identity of wood flooring significantly shows the culture of living, mentality and tradition of the country in which the flooring is produced. The abovementioned is the easiest to be confirmed by analyzing promotional material for wood flooring. Producers from Central European countries experience and present wood flooring in a more extravagant manner which is sometimes on the verge of good taste and decency. Unlike them, producers from Western European countries highlight quality and uniqueness of wood characteristics as a natural material.

Unlike the developed countries, undeveloped and developing countries have a completely different approach to visual identity of a product. Producers from the latest accessed EU countries (Romania, Bulgaria, the Czech Republic, Slovakia) as well as the potential member states (Serbia, Croatia and others) use the benefits of comprehensive programs which their Governments implement with the aim to promote different product groups exported from these countries. Since in most cases those are small and middle-sized companies which are not so financially strong as the companies from the developed countries, such Government programs are of great significance for these companies regarding the “free” promotion of their products. In that sense, each program includes defined criteria which the products must fulfill in order to obtain a national quality and recognition mark.

One of numerous confirmations of the stated statement is an example of exporting a lot of products from Croatia with the new code and message "Izorno Hrvatsko" („Croatian Creation“) and "Hrvatska kvaliteta" („Croatian Quality“) (Picture 2). With visual marking of quality products and services, Croatia wants to set a new visual code on the world market and thus assist Croatian companies for their products and services to be recognizable and more competitive on most markets.

Products and services with "Izorno hrvatsko" mark have a special value. This results from the fact that those are quality products and services which include elements of Croatian tradition, development research work, innovation or invention, namely the products and services with unrepeatable and unique features.

"Hrvatska kvaliteta" mark guarantees the buyer that it is a product or service which reliably represents the top of world offer in its class.

Similar to Croatia, the Government of the Czech Republic has developed a program for promoting quality of national products in which national belonging and quality is highlighted through the messages *czech made* and *češka kvalita* (Picture 3).



Picture 2: Visual identity of products from Croatia

Source: Hrvatska gospodarska komora, www.hgk.hr



Picture 3: Appearance of the mark for the products from the Czech Republic

Source: www.czechmade.cz

6.1. Marketing Campaign for Strengthening Visual Identity of Wood Flooring in Serbia – Current Situation

As a result of similar activities, visual identity has been developed in Serbia which generally refers to all products with code and message „*the best from Serbia*“. Projects supported by certain Ministries and Agencies of the Republic of Serbia Government (SIEPA) have greatly contributed to the development and application of the mentioned visual identity. Good results are achieved with this project in the area of creating a recognizable visual identity for certain product types exported from Serbia. This refers in particular to fruit and vegetable products (juices and others), which have achieved significant results regarding the recognition by a lot of consumers on the EU and USA markets, which has resulted with a significant increase of their export from Serbia.

Since the development of visual identity referred to different product categories (fruit, textile, drinks, etc.) that can carry the mentioned mark, the Ministry of Science and Technological Development started with the development of the program for visual identity only for wood products having in mind their importance for the national economy.

Before the realization of this project has started, there was no organized research and activities in the field of developing recognizable visual identity for wood flooring exported from Serbia. Some of the activities were conducted within the companies themselves that operate in wood flooring production and export, but they were limited and with limited objectives.

One of the first objectives of the started program for developing new visual identity of wood flooring from Serbia was creating the mark, in this case together with the message „*good wood comes from Serbia*“ (Picture 4).



Picture 4: Appearance of the mark for wood flooring produced in Serbia

When creating the mark, attention was paid for it to be acceptable and easily recognizable for consumers on foreign markets since the objective of the program was the development of visual identity of wood flooring exported from Serbia onto the most significant markets of the European Union countries. Because of better acceptability and adaptedness of the mark and since the wish is to create visual identity of flooring on foreign markets, Serbian language and Cyrillic letters were not used in its creation.

The main symbol used in the creation of the mark is a tree, and the reasons are numerous. Wood is natural material and each tree is unique and unrepeatable in its structure. Unlike other materials from nature, wood is said to be warm, its usage in space in the form of different products produced from it is harmless for user's health. The appearance of the mark also speaks about environmental aspect of the products on which it is going to be used.

The accent is on wood in the graphic part of the mark as well, beside its textual part. With the combination of slogan and picture of a tree, the message is sent to the consumers that the tree that grows in Serbia and which is used for flooring production is of extremely high quality and characteristics.

Beside the tree that represents the symbol of naturalness, the graphic part of the mark has a barcode as a symbol of legal trade. Having in mind that in numerous studies done for the needs of international organizations (FAO) and institutions (The World Bank, IMF) Western Balkan countries are marked as the countries with high participation of illegally harvested wood in overall trade, the barcode symbol tends to change that picture about products exported from these countries including Serbia.

The mark also highlights that the products on which it is present are produced from solid wood, which at the same time represents a guarantee of quality to consumers as well as the guarantee of its content compared to numerous other products that only imitate wood with their appearance.

Having in mind that the program defines extremely strict criteria which producers have to fulfill, as well as strict controls and checks of production and characteristics of finished products, relatively small number of producers exporters is now entitled to use the abovementioned mark. The first effects of companies that use this mark as a feature of their products in exporting onto the markets of the EU countries are highly satisfactory. Therefore it is necessary to continue further work on the development of visual identity of wood flooring from Serbia through creating promotional material which will accompany products all the way to the end consumer.

7. CONCLUSIONS

In the conditions of strong market competition and many producers of high quality wood flooring, it is very important for the producers from Serbia to be recognizable on foreign markets. Having in mind the stated fact as well as the fact that most of them are small and middle-sized producers that have limited resources which they use for certain marketing activities, the Republic of Serbia Ministry of Science and Technology has started a project with the aim to strengthen visual identity of wood flooring exported from Serbia. This is a unique program of this kind for wood flooring which has started in Serbia compared to all other surrounding countries. In the project realization phase so far, the mark and adequate promotional material have been created, after which the terms for becoming entitled to use it and other accompanying materials will be defined. The first effects of using the abovementioned mark with both producers on whose products the phase of practical realization of project results is being carried out are positive, while full effects are expected after project completion and implementation of the results. All this will significantly contribute to the competitiveness of wood flooring exported from Serbia onto the European Union market.

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CONSUMER PREFERENCES FOR WOOD FRAMED HOUSES

Vladislav Kaputa, Ján Parobek

ABSTRACT

The paper deals with the selected results of a survey aimed at the Slovak consumer's preferences for attributes of wood framed houses. The purpose of the paper is to introduce methods used in survey and data processing as well as to pointed out and discuss attributes, which seem to be more or less significant for consumers.

Authors aimed at the general preferences for the attributes of new constructed houses – not distinguishing main constructive materials (wood, concrete, etc.) and further, preferences for respective attributes of wood framed houses. Some additional aspects (e.g. concerning environmental issues and costs of purchase) are discussed.

Key words: questionnaire survey, consumer preferences, attributes of wood frame houses.

1. INTRODUCTION

Besides the non-production forest functions and a wide scale of services for society, the significance of forests is also raw wood material production. The way of roundwood from the forest to final consumer is quite long and many times it has to pass different levels of processing and different types of markets while it is used for the desired purposes (Paluš, 2002). Wood and wood products can be widely applied at the different types of market, from large commodity markets (construction industry) to niche markets (musical instrument production).

Taking into account the different properties of wood (stability, durability, aesthetic properties, ecologic properties, renewable resource, etc.) there are different possibilities for wood utilisation and a different number of competitive (substitutive) products and materials existing on each of the markets. A real technical compatibility and possibility to meet the same needs and expectations of consumers are the basic precondition for products substitution. Optimally, substitution process in each market sector should to be evaluated individually. Such an approach will allow pointing out the factors and trends within each market sector and to recognise whether the wood products are the “winners” or “losers” in the competitive fight (Paluš, 2006).

2. METHODS

Research of the preferences for wood framed houses attributes among consumers in the Slovak Republic was carried out during the years 2008-2009. Non-probability sampling (purposive sampling) with the aim to cover as much consumers as possible and to cover all demographic categories was used to collect data. Questionnaires were distributed directly to respondents as well as communicated by e-mail. Totally, 300 questionnaires were distributed regarding our capacities (human, financial etc.).

Specific components of the Total Design Method (TDM) described by Dilman (2000) were used in the survey with purpose to solve a problem of response rate. Response rate refers to the percentage of the total number of respondents who complete and return questionnaires (Maťová, Kaputa, Paluš, 2008). To increase or maximise the response rate “a reminder” were one or two times sent to the respondents who did not answer via e-mail.

The questionnaire contains eight questions regarding consumers' attitudes as well as questions concerning demographic factors. Demographic factors are sex, age and achieved education. Most of the questions related to the different attributes of wood framed houses. The answers have a form of five-point Likert scale. The data obtained from the survey was transformed to the electronic form for further analyses. As the collected data represented qualitative data, it was necessary to transform it to the quantitative form. Owing to the use of purposive sampling, the methods of descriptive statistics were applied. The frequency analysis was used for primary statistical analysis of data. Frequency tables illustrated absolute and relative occurrences. Contingency tables were used to analyse relationships between the demographic factors and the answers.

Kaputa (2008) applied *united factor* (UF) to analysed data obtained in consumers' attitudes research. UF originates in demographic data and is used in this survey to divide respondents according to the answers specific for each subgroup. Table 1 shows subgroups of the respondents created from obtained demographic data.

Table 1. Subgroups of the respondents divided according to the united factor (UF)

| Sex | Age | Achieved education | United factor (UF) |
|-------|---------------|--------------------|--------------------|
| MEN | 18 – 30 years | primary school | 111 |
| | | high school | 112 |
| | | university | 113 |
| | 31 – 55 years | primary school | 121 |
| | | high school | 122 |
| | | university | 123 |
| | over 55 years | primary school | 131 |
| | | high school | 132 |
| | | university | 133 |
| WOMEN | 18 – 30 years | primary school | 211 |
| | | high school | 212 |
| | | university | 213 |
| | 31 – 55 years | primary school | 221 |
| | | high school | 222 |
| | | university | 223 |
| | over 55 years | primary school | 231 |
| | | high school | 231 |
| | | university | 233 |

Usually not all subgroups are included into analysis since the low-numerousness subgroups occurred frequently (e.g. respondents with primary school achieved education).

The article introduces selected results of the survey. General preferences for the attributes of new buildings – not distinguishing main constructive material (wood, concrete, etc.) and further, preferences for the attributes of wood framed houses are mainly discussed. Additionally some other aspects as questions concerning environmental issues and costs of purchase are also introduced.

3. RESULTS

The second and third round of e-mailing (Table 2) has increased response rate of the questionnaire survey. Finally, 180 questionnaires have been put into database.

Table 2. Response rates of individual rounds of questioning

| <i>Round of questioning</i> | <i>Absolute number of the respondents</i> | <i>Response rate</i> |
|-----------------------------|-------------------------------------------|----------------------|
| 1 st round | 117 | 39 % |
| 2 nd round | 159 | 53 % |
| 3 rd round | 180 | 60 % |

Notice: Totally 300 respondents have been asked to fill out the questionnaire

Share of women participated in the survey is 51 % and the share of men is 49 %. Concerning an achieved education of the respondents, 75 % with high school degree and 25 % with university degree took part in the survey. Any respondent with primary school degree of education has been occurred in our sample. Consequently, there is not such subgroup mentioned in the following text. The most of respondents (48,3 %) are 18-30 years old, followed by the group of 30-55 years old (38,3 %) and the group over 55 years old respondents (13,3 %).

Respondents were divided to the subgroups using united factor. Subgroup 233 was excluded from analysis due to its low-numerosity and following subgroups had not any representatives: 111, 121, 131, 211, 221 and 231. Due to the circumscribe extent of this paper the results of united factor's analysis (tables and graphs) are not detailedly introduced.

3.1. Preferences for attributes of new constructed houses

Six criterions were evaluated by respondents in question "What do you prefer for a new house construction?". Table 3 introduces the significance of each criterion divided according to the share of respondents' answers.

Table 3. Significance of criterions of new constructed houses

| <i>Criterion</i> | <i>Answer</i> | | | <i>UF analysis results</i> |
|-----------------------|----------------------------------|-----------------------------|--------------------------------------------|------------------------------|
| | <i>Very important, important</i> | <i>Uncommitted attitude</i> | <i>Not important, not at all important</i> | |
| Cost saving | 69,7 % | 20,8 % | 9,5 % | 113, 123, 213, 132 |
| Material | 74,2 % | 20,2 % | 5,6 % | 213, 232, 223, 112, 113 |
| Durability | 77,0 % | 15,7 % | 7,3 % | 222, 232, 112 |
| Aesthetics | 77,0 % | 20,2 % | 2,8 % | 213, 232, 133, 112, 123, 212 |
| Construction time | 35,0 % | 36,7 % | 28,3 % | 133, 132 |
| Environmental factors | 39,9 % | 37,6 % | 22,5 % | 223, 112, 222 |

Nearly 70 % of respondents labelled the criterion "cost saving" as *very important* or *important* (hereafter referred to as *important*). Results of united factor analysis (UF analysis) illustrated subgroups 113 (100 %²), 123 (80 %), 213 (80 %) and 132 (nearly 78 %) in which big shares of respondents consider this criterion for significant.

"Material" used in a new house construction is important for more than 74 % of respondents. Within them subgroups 213 (100 %), 232 (nearly 86 %), 113 (over 83 %), 223 and 112 (both nearly 82 %) and have the biggest share of respondents considering this criterion for significant as UF analysis showed.

² The percentage refer to the share of all respondents in the respective subgroup

“Durability” as well as “aesthetics” are considered by 77 % of surveyed consumers to be important criterions. UF analysis showed that “aesthetics” is mainly significant for the respondents of subgroups 213 (90 %), 232 (nearly 86 %), 112 (nearly 85 %), 133 (over 83 %), 123 (80 %) and 212 (over 76 %).

Many of respondents (nearly 37 %) have uncommitted attitude to the criterion “construction time”. Mostly respondents of subgroup 133 (nearly 67 %) labelled this criterion as “important”.

“Environmental factors” are important for almost 40 % of surveyed consumers. Segmentation that is more detailed showed that up to 47 % of university educated respondents do not know to take an attitude towards this criterion and 22 % of them do not consider environmental factor as important. Almost the same share (23 %) of high school educated respondents labelled this criterion as not important (or not at all important) too. Regarding the age of respondents, mostly respondents older than 55 years do not consider this criterion as important. UF analysis illustrated that environmental factors are important mostly for the respondents of subgroups 223, 112 (both nearly 55 %) and 222 (over 52 %).

3.2. Preferences for attributes of wood framed houses

Eight criterions were evaluated by respondents in question “How do you assess following attributes of wood framed houses?”. Table 4 introduces the significance of each criterion divided according to the share of respondents’ answers.

Table 3. Significance of criterions of wood framed houses

| Criterion | Answer | | | UF analysis results Subgroups with the biggest share of respondents assessed criterion positively |
|------------------------------|-----------------------------|----------------------|-----------------------------|------------------------------------------------------------------------------------------------------|
| | Very positively, positively | Uncommitted attitude | Negatively, very negatively | |
| Construction costs | 37,6 % | 36,5 % | 25,9 % | 223 |
| Risk of fire | 22,5 % | 21,3 % | 56,2 % | *negative assessment: 112, 213, 113 |
| Acoustic attributes | 57,9 % | 28,1 % | 14,0 % | 223, 133, 123 |
| Thermo-insulating attributes | 70,8 % | 21,9 % | 7,3 % | 133, 213, 122 |
| Durability | 45,0 % | 37,6 % | 17,4 % | 222, 232 |
| Environmental factors | 51,7 % | 35,4 % | 12,9 % | 232, 122, 123, 212 |
| Enjoyable living | 84,3 % | 12,4 % | 3,4 % | 232, 133, 132, 123 |
| Aesthetics | 74,7 % | 19,7 % | 5,6 % | 113, 232 |

* Just in this case table introduced subgroups with negative assessment of criterion

Nearly the same share of respondents have either uncommitted or positive attitude towards criterion “construction cost”. According to the UF analysis, mostly respondents of subgroup 223 (nearly 73 %) assessed construction costs of wood framed houses *very positively* or *positively* (hereafter referred to as positively).

The most negatively assessed criterion (of all criterions) is “risk of fire” where more than 56 % of surveyed consumers assessed it *negatively* or *very negatively* (hereafter referred to as negatively). The UF analysis showed that the highest shares of respondents with mentioned attitude are in subgroups 112 (nearly 70 %), 213 (70 %) and 113 (nearly 67 %).

“Acoustic attributes” have been assessed positively almost by 58 % of respondents. Any respondent labelled “acoustic attributes” of wood framed houses as very negatively. UF analysis illustrated that the most of respondents with positive assessment are in subgroups 133 (over 83 %), 223 (nearly 82 %) and 123 (over 80 %).

“Thermo-insulating attributes” are generally assessed positively (nearly 71 % of all respondents), especially by men (75 % of all men in the sample). The highest shares of respondents with positive attitude are in subgroups 122 (84 %), 133 (over 83 %) and 213 (80 %) as UF analysis illustrated.

Respondents are not so sure with “durability” of wood framed houses since just 45 % of them assessed it positively. Further, nearly 38 % did not know to answer. According to UF analysis are the respondents with uncommitted attitude mostly in subgroups 113 (nearly 67 %), 112 (nearly 58 %) and 132 (nearly 56 %).

Many respondents (35 %) labelled uncommitted attitude regarding “environmental factors”. On the other hand, almost 52 % assessed mentioned factors positively. Further, examination of data does not prove significant differences between answers of university and high school educated respondents.

The most positively labelled criterion is “enjoyable living”, since more than 84 % of respondents expressed this attitude. UF analysis showed that such as respondents are particularly in subgroups 232, 133 as well as in 132 and 123 (100 % all). It is worth to mention that nearly no negative assessment exist (except 6 respondents) in the surveyed sample.

As well as previous criterion, also “aesthetics” is mostly positively assessed (almost by 75 % of respondents). This attitude have particularly young and university educated men (113; 99 %) as well as high school educated women over 55 years old (232; nearly 86 %).

Concerning consumers’ decision to build a wood framed house, one question surveyed *consumers’ willingness to pay higher costs (within 3-8 %) comparing the costs of house built from classic materials*. Each of three categories of answers (“definitely yes” and “yes” as *positive attitudes*, *uncommitted attitude*, “not” and “absolutely not” as *negative attitudes*) is more or less represented by one-third of all respondents. Dividing the respondents according to the achieved education, there is bigger share of university educated respondents (45 %) willing to pay higher costs. UF analysis showed that such as respondents are dominant in subgroups 223 (nearly 55 %), 113 and 213 (both 50 %).

The question “*Would you prefer wood from certified forests for wood framed house construction?*” introduced interesting result, since 65 % answered *yes* or *definitely yes*. Detailed (UF) analysis illustrated that the highest shares of the respondents (over 70 %) who prefer certified wood are within high school educated men and women over 55 years old (132; nearly 78 % and 232; over 71 %). Neither in all the rest subgroups is not share of the respondents with positive attitude lower than 50 %. *Absolutely not* or *not answered* only 17 % of surveyed sample.

The questionnaire contained also question related to the environment. Almost 62 % of respondents *would prefer wood framed house (comparing house from classic materials) considering assumption that they could reduce negative impact on the environment*. Mostly women between 18-30 years old with university or high school achieved education (213; 80 % and 212; nearly 74 %) are the respondents with such as attitude.

4. DISCUSSION

Just a few of surveyed respondents have right opinion on costs (respectively final price) related to the wood framed houses construction. This stand comes from premise that wood framed houses (comparing houses from classic materials) cost more generally. On the other hand, they know and appreciate attributes (e.g. thermo-insulation) which relate to house using and bring costs saving usually.

More than half of respondents negatively perceive risk of fire and so it is definitely the worst assessed attribute.

Consumer preferences dominantly lie on non-material criterions introduced in this survey. Enjoyable living and aesthetics of wood framed houses are perceived very positively, but could not be expressed by any measure. Marketing oriented approach offer price as a tool to measure consumer preferences. In spite of it just a price is very often main criterion in purchase decision and is still sensitively perceived by consumers in Slovakia.

Some attributes are still in a mist for consumers of wood framed houses since significant part of them have uncommitted attitude. Concretely durability and environmental factors as well as above mentioned construction costs. Especially environmental factors cover many issues connected to human mutual relations with environment. It is often too complicated for consumer to understand mediate information. In this sphere, it is necessary to communicate to the consumers and educate them. Owing to previous context, preferences for wood from certified forests look interesting. Consumers significantly prefer certified wood, but it is not displayed to the demand yet. Moreover, they usually proclaim their interest to contribute (through their behaviour) on reducing negative impact on the environment. According to Gejdoš (2004, p. 32) public in Slovakia is not active in environmental sphere since up to ¾ of wood processing companies noticed any complaints regarding environmental issues.

Target group of wood framed houses consumers could be described according to the performed united factor analysis that allowed us to search relationships between demographic data and attitudes of respondents. It is connected with the question about decision of respondent to pay higher costs (within 3-8 %) for wood framed house comparing the costs of house built from classic materials. Potential consumers could be identified as university educated women between 18-55 years old as well as university educated men in age between 18-31.

Similar studies occasionally pointed out some differences between consumers' proclaimed preferences and their real (not only purchase) behaviour.

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WOODEN BUILDINGS IN SLOVENIA

Slovenian public opinion on Wooden Buildings and Furniture Industry

Manja Kitek Kuzman, Matej Jošt

ABSTRACT

Future development directions of the contemporary buildings are based on naturally renewable energy resources, the development of new wood composite materials and higher levels of prefabrication in a process of architectural planning. Prefabricated wooden houses in residential buildings present minor part of all buildings in Slovenia. The reasons pertaining to the relatively low occurrence of prefabricated wooden buildings today are assessed in the presented study. Results of public opinion survey make clear the user's lack of knowledge about the wooden buildings. The dominants of brick and concrete constructions reflect the opinions of the respondents in our survey, but at the same time growing interest in healthier living, use of natural materials and energy energy-saving building is detected. The survey presents one of the important instruments for popularization of wooden building in a sense of the education and dissemination of its advantages.

Key words: wooden building, public opinion survey, residential building, construction.

1. INTRODUCTION

The purpose of this paper is to portray the problems of wooden building and to explore the possibilities to increase wooden building in Slovenia. We have assumed that the biggest problem regarding wooden building in Slovenia is not an economic one, but mostly poor knowledge on wooden building and its properties in general. Over one half (52,5%) of all building activities in Slovenia are represented by construction building. Around three quarters of that falls to building new buildings and only a smaller part to renovating old ones (Sitar et al, 2005). The biggest part of existing constructions consists of domestic constructions (43%); over a half (56%) of all domestic constructions are made of brick, 16% are made of concrete while all the other building materials are represented in minority.

Data shows that buildings built after the year 2000 show a trend in material usage for the last 5 years, t.i. the usage of concrete constructions has increased by 60%; the usage of wooden constructions has increased by 35%, whilst the usage of combined construction has declined. The usage of brick constructions has in the meantime stayed constant (Kilar, 2004). There were 3.758 domestic constructions built in Slovenia in 2003 and just 5% of that were built using wood as the main building material (Statistični letopis, 2005). According to a survey on manufacturing and sales of prefabricated houses in the period from 1999 - 2004 (Kožar, 2005) there were 823 prefabricated houses manufactured in 2004 (92% single-family houses) and 20 % of those were sold at home. Today the share of wooden domestic constructions in Slovenia presents less than a 13%. For comparison we can take Austria, where in 1980, 1.300 prefabricated houses were manufactured, in 2002 already 5.684 (ProHOLZ, 2006) and today wooden domestic constructions present about 35 % of all built domestic buildings (ProHOLZ, 2006).

In Finland the share of wooden prefabricated houses in all the manufactured one-family constructions is between 70% and 80% (INVEST IN FINLAND, 2006). In the next 5 years we are expecting a demand for 35.000 one-family houses, according to Mandič (2005) report. We are also expecting a deficit in one-family houses. To fight that deficit we will need to build new houses and also renovate some old ones. In this research, we have tried to find out why the share of wooden buildings in Slovenia is so small and how much people actually know about advantages of wooden building. We

have studied all the factors that influence the decisions on choosing either wooden or classical construction building. We have assumed that the share of wooden constructions in Slovenia was so low, because the properties of wooden constructions (either its advantages or disadvantages) were very poorly known.

2. METHODS

The survey entitled *Slovenian public opinion on wooden buildings* included participants between 25 and 40 years of age, who were considered to be potential buyers of wooden houses based on the registry of population. They were chosen randomly, which ensures, that the sample represented the whole Slovenian population adequately. Data was gathered using the CATI method (computerized telephone survey). The survey started throughout Slovenia on May 16th and lasted until June 3rd 2006 and it included 628 participants. The sample chosen represents all 12 statistical regions in Slovenia and reflects the representative sample of the Slovenian population.

The survey was developed by a research group from the Biotechnical Faculty Department of Wood Science and Technology (Kitek Kuzman, 2006). A number of experts in the fields of architecture, construction and timber construction also gave their input. Each individual featured in the survey was asked 5 questions. In the first question they had to decide between classical brick construction and wooden prefabricated construction. In the following steps they had to list reasons for choosing wooden prefabricated construction. The second question had to do with their knowledge on properties and advantages of wooden prefabricated construction. The third question was similar to the first one, only this time they were asked about timber-framed penthouse. The fourth and fifth questions were regarding ecology and were asking about the ecological view of wooden construction and passive house.

3. RESULTS

The first question was asked in order to determine the type of construction people would use, if they were building a new house today. Would their preference be to build a classical house or a wooden prefabricated house? The results showed that 60% of all participants in the survey would choose to build a classical house and 34% would choose to build a wooden prefabricated house (Fig. 1).

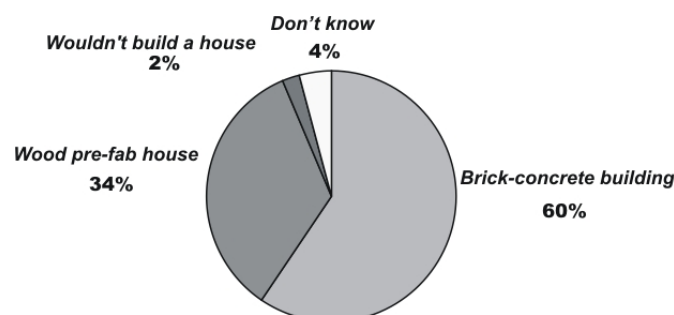


Figure 1. »If you would build a house, what would you prefer a traditional brick-concrete one or wood-prefabricated house?« (n=628)

The participants, who answered that they would rather build a traditional brick-concrete house, were asked for the reasons against wood prefabricated building. Main reasons given were habits, traditions and poor knowledge on the properties of wooden construction (Fig. 2).

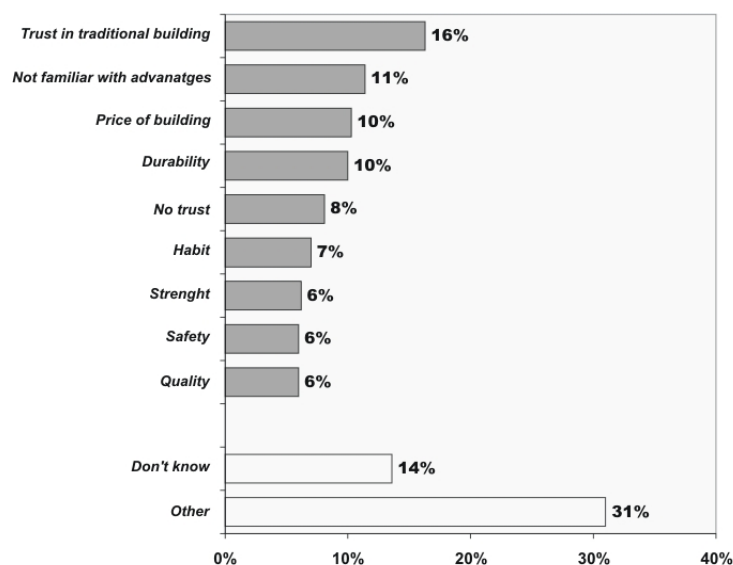


Figure 2. »Why wouldn't you decide for wood building?« (n=376)

The results of the survey showed, that less than half of participants (47%) knew the advantages of wooden construction, therefore we could claim that the general knowledge on wooden construction was poor (Fig. 3). The participants who were familiar with the advantages of wooden construction were also asked to state what those advantages were in their opinion. The biggest advantages according to survey results were: short building time, ecological, better insulation, price and economic efficiency (Fig. 4).

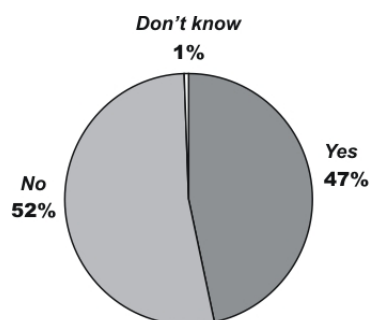


Figure 3. »Are you familiar with the advantages of wooden building?« (n=628)

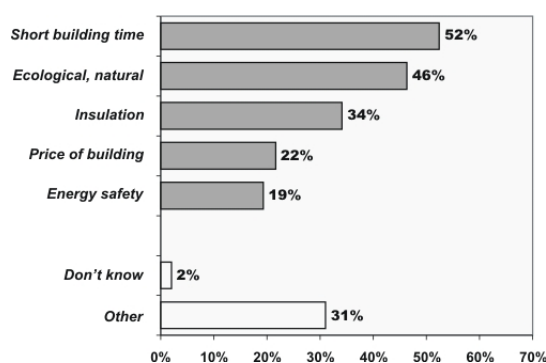


Figure 4. »What are the advantages of wooden building?« (n=296)

Next question in the survey was, if the participants would choose timber framed penthouse extension, in case they needed more living space. 13% answered yes and another 10% answered maybe. The participants, who would not opt for a timber-framed penthouse, were then asked for reasons why. The most common objection against timber-framed penthouse extension was a concern

about combining a brick-concrete building with a wooden building concern with the aspect of quality and aesthetic being the biggest issue (Fig. 6).

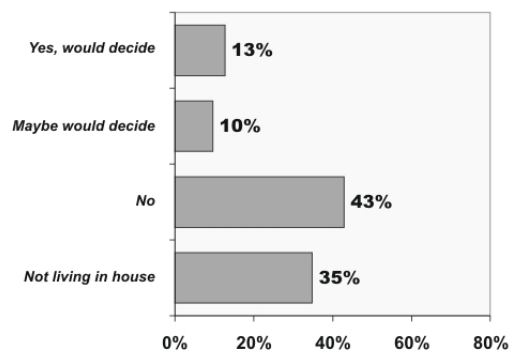


Figure 5. »If you were looking to increase your living space, would you consider a timber-framed penthouse?« (n=628)

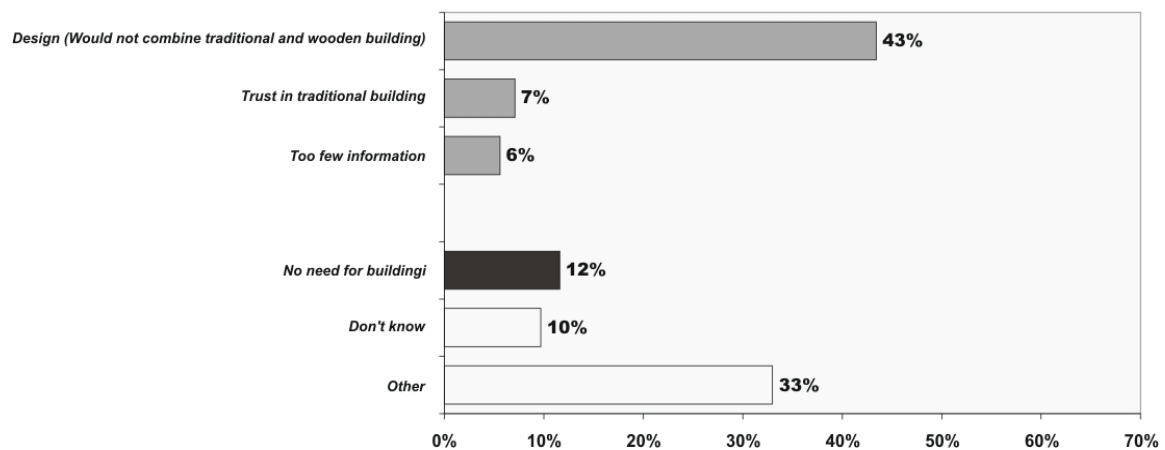


Figure 6. »Why wouldn't you opt for a timber-framed penthouse?«

Participants also graded some statements considering wooden construction, usage of wood in general, ecology and a healthy living environment. 70% of participants are in total agreement with the statement, that the government should appoint more funds towards building ecological constructions. Most of them also agree with the statement, that wood is good furniture building material (63% completely agree with that statement) (Fig. 7).

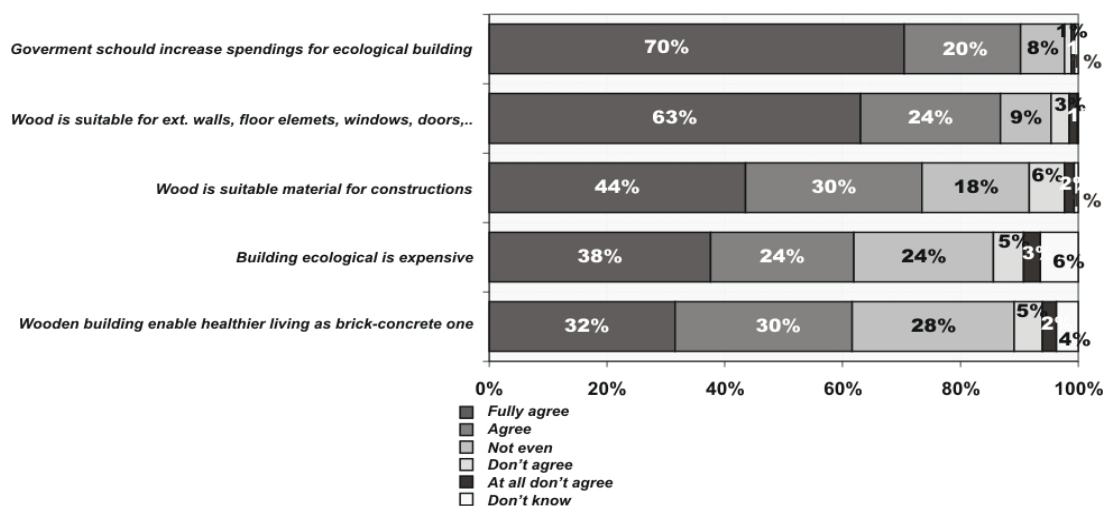


Figure 7: Statements on ecology and passive construction

In recent years a number of low energy and ultra-low energy houses (PH) have been build. We wanted to establish what the general public's knowledge of low energy housing was. The results of public research showed consumer's lack of knowledge about Passive house and its advantages (Fig. 8).

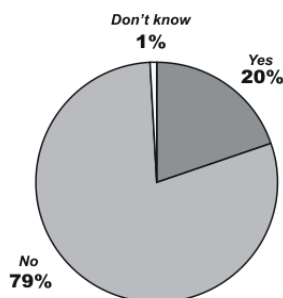


Figure 8: »Are you familiar with Ultra-low energy house (PH)?«

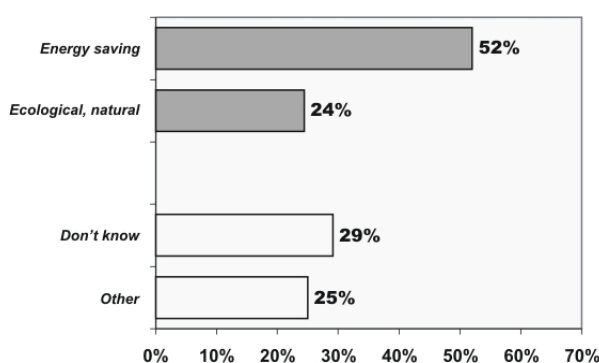


Figure 9: »What are the advantages of a PH in your opinion?«

4. CONCLUSION

There is a small share of newly built timber framed buildings in Slovenia, but still a positive trend can be noticed indicating the rise of wooden building popularity. Since the wooden building in Slovenia is under performing according to tradition and natural resources, the main reasons were investigated by the presented public survey. The results show, that people who would choose a brick-concrete construction, would do so mainly because of old habits, tradition and poor knowledge on wooden construction. Less than 47% of participants were familiar with advantages of wooden construction. We have assumed that the share of wooden constructions in Slovenia was so low, because the properties of wooden constructions (either its advantages or disadvantages) were very poorly known. We can now claim that our assumptions were correct.

65% of Slovene population lives in an individual house (Product Group Manager, 2005), which was also confirmed by our survey results. One of the questions in the survey was, if the participants living in a house would choose timber-framed penthouse extension in case they needed more living space. Minority answered yes or maybe. The most frequently given answers against timber-framed penthouse were reservations about quality and aesthetics of combining classical and wooden construction. The participants also stated that they think ecological construction is more expensive, but on the other hand they admit, that it provides a healthier living environment. Most participants think that wood is good furniture making material, but less appropriate for construction. Only 5% of participants are familiar with the passive construction and they see its advantages in energetic efficiency and ecological construction. In the next 5 years we are expecting an increased demand for one-family houses, according to research (Mandič, 2005), we are also expecting an increase in wooden construction.

In conclusion, we can say that the existing market for wooden construction today reflects the public opinion on wooden construction. Trend for increasing healthier living, the use of natural resources and materials and energy saving building have been identified. The main task in the future should be informing and educating the public about advantages of wooden construction. We consider this public survey to be a good starting point for a potential campaign on rising awareness on the subject of wooden construction in Slovenia.

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PROMOTION AS A SOURCE OF COMPETITION FOR WOOD PROCESSING AND FURNITURE COMPANIES

Živka Meloska, Violeta Efremovska

ABSTRACT

The role of the promotion as a competition factor is very important for the companies as well as the countries that are going through the period of reconstruction and development.

The promotion at the company frames in Republic of Macedonia, at the last period of time did not manage to find its right place because of a lot of certified and not certified reasons. For these reasons, in the future it is necessary for community relations to be changed, as well as the companies relations at the promotion communications by building of a promotion strategy too.

Key words: promotion, competition, company, market, strategy, export.

1. INTRODUCTION

Competitiveness of a company in addition of its development is of a big importance. The main role of the market position of the company in terms of market economy is the competitiveness. It is of a big importance for the companies in Republic of Macedonia, before all because of the fact that the Macedonian market is very small and determinate, so a lot of the companies are forced to place their products at foreign markets.

The companies that are working with wood processing and production of furniture, for success promotion at the market and realization of high competitiveness in terms of complicated relations, when R. Macedonia makes efforts on integration with the European Union, the already existing comparative advantages of the economy and the company itself are not enough any more, but there is a need of implementation of all of the non-price factors of the competition.

The role of these factors analyzed by their own, or as a mix of the same is very big, especially in terms of increase of the companies themselves and realization of higher competitive position at the market. From all of the factors (products, distribution etc.) the role of the promotion for increase of the competition capability of the company is of a big importance.

2. EXISTENCE OF THE SEPARATE TYPES OF PROMOTION AS A FACTOR FOR INCREASE OF THE COMPETITION

Promotion as one of the main non-price factors, that affect the company competitiveness can be realized this way:

- economical promotion,
- sale increase,
- personal sale and
- publicities and public relations

Which of these shapes will be implemented depends on the type of the product and the market characteristics.

In the past period of time in Republic of Macedonia, firms were using the economic promotion as a type of promotion most of all. For foreign market the promotion was mostly used with flyers, catalogs, addressers, and as with the media, newspapers, radio and television were less used. Different from the foreign market, at the domestic market mostly were used media especially economic promotion at television and radio, as well as the advertisers in the newspapers.

The reason of this selective and monotonous implementation of the promotion activities at the foreign market was the factor that the companies that were export oriented still did not have built an export measurement of production as a mean for presentation of its own background. Still at the domestic market, at the media could have be seen promotion for the foreign products more than for the domestic ones.

With the aim of increase of competitiveness at the foreign and at the domestic markets, companies were using further activity - promotion of sale as a second type of promotion. This activity was pointed to the marketing organization units and to the external marketing - areas (organization units abroad, wholesale and retail trade abroad). But, all of these activities and efforts did not give the expecting results, because in the companies for wood processing and production of furniture lately were registered:

- lack of products and service that with their quality and level of production can become a products for export,
- the export companies were looking after a large costumers, but they were offering small production and small quantity (small offer).
- mutual competition at the foreign markets,
- not-completed already realized deals.

No mater of the previous the company efforts for participation at exhibitions and fairs in the country and abroad should be mentioned as well. We should mentioned that here as well can not be seen any export increase and promotion of the competition because of the state economic subjects did not have built a concept for domestic and foreign fairs and exhibition participation.

Public relations and publicities as a type of promotion, apart from the economic promotion and increase of sale, that are directly pointed at increase of sale of foreign market have the aim of getting public confidents and making a good image of the company abroad. This activity of promotion especially for the companies for wood processing at the last period of time was not realized from the reason for realization of the same were needed a lot of efforts and means, and of course not possessing of association that can put them together and will make their promotion abroad (wood cluster).

These and other reasons a lot of developed countries, but the developing countries too, make the misappropriate positions of export economy in R. Macedonia.

At the end we should mention that the personal sale as a type of promotion and as a factor of competition is of a very small or almost none usage at the companies for wood processing and production of furniture.

Table 1. Implementation of types of promotion from the companies for wood processing and production of furniture in Republic of Macedonia

| Type of promotion | Implementation at the company |
|--------------------------------|-------------------------------|
| Economic promotion | Mostly implemented |
| Sale increase | Implemented |
| Publicity and public relations | Not-successfully implemented |
| Personal sale | Not implemented |

3. CHARACTERISTIC OF THE IMPLEMENTED PROMOTION ACTIVITIES

Main characteristic of the promotion activities that are implemented at the companies for production of furniture is their orientation to the domestic market. Of course, there are a large number of factors, but most important is the factor that for promotion abroad a large financial meaning is needed, that a lot of companies can not afford. In Republic of Macedonia there are a lot of companies for wood processing and production of furniture, but they are small or middle-sized companies.

Considering this, these types of companies were put in a position was they could not take attention to the politics of promotion. With a lot of them there was a thinking that the means given for promotion are nonproductive expenses, no mater of the fact that means for promotion can not be left aside, or been replaced with other activities.

Considering this promotion means treatment, we can say that almost none means were given for market research as here as abroad too. The companies did not make some special research that can help to make some solid base for planning of promotion activities. As a result of these, the products promotion was not done adequately and systematically, but they were acting separately, from case to case. Because the promotion was not considered in context of action with the rest of the marketing instruments and results from the already realized partial promotion activities, very often were not satisfactory.

As it was already mentioned, the products of Republic of Macedonia, especially the ones made of wood are not very known at the foreign market. This is as a consequence of the fact that the promotion at the foreign market has been realized at very small end determinate frames, without any plans and without any continuity. A large number of the companies have left the organization, leading and the promotion abroad to a foreign economy trade company. These companies because of their engagement of export of different products, and in absence of common interests, have formed their own trade politics. In these frames, the promotion of one product and its planning, even under the best adequate terms had a secondary meaning.

Here we should give the fact that with a large number of companies, the export of the products and the promotion activities were given as a separate things. Inside of the promotion activities to be determinate and input in export actions, they had the role of sale service, pointing out the already made predicts.

At the end, we should mention that the largest number of companies have been realizing their promotion activities by people of different profiles, people that do not know the product characteristics that are doing the promotion at, they did not know the distribution ways and of course the final buyers. They should be communicative, to have a feeling of promotion, to have a good knowledge for the terms of selling act.

4. CONCLUSIONS

According to the already made analysis about the present of the types of promotion and characteristics of implementation of the promotion activities in the company for wood processing and production of furniture in Republic of Macedonia, we can give the following conclusions:

- Companies are characterized with very low capability of comeptitiveness, on the domestic as well as on the foreign market.
- Not enough and selective is the implementation of the promotion activities.

To increase the competitiveness the companies should:

- Promote the quality and standardization of their products.
- Change the point of use to the expenses for promotion from not-productive to priority expenses.

- Organize actions toward foreign market with respect of the given terms and agreements.
- Include adequate experts in leading of the promotion activities.

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COMPARISON OF WOOD PRODUCTS PRODUCTION AND CONSUMPTION IN THE REPUBLIC OF CROATIA

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ABSTRACT

The paper analyzes the consumption share of wood products in the Republic of Croatia and presents consumption trends of certain wood products on the Croatian market during the last five years. Income from particular groups of wood products and production trends during the last five years are studied. In view of significant differences in the consumption and production share of certain wood products, this study attempts to highlight the competitive potential of domestic manufacturers on the Croatian furniture and wood products market.

Key words: consumption, production, furniture, wood products

1. INTRODUCTION

The economic development of a country is targeted towards improving the living standard of its citizens. This goal can be achieved by increased production, which in turn leads to increased employment and, finally, to the satisfaction of all forms of consumption (Bilen, 2007). Every commodity production is realized on the market – an area in which goods and services are bought and sold. Wood industry plays a very important role in the economic development of the Republic of Croatia, despite the fact that for the past several years, Croatian furniture and other wood products manufacturers have participated in the total GDP with only about 2% (www.poslovni.hr).

Production is a very important element in the economy of any country. Its increase positively affects the economic growth and augments the country's GDP. Four production factors of progress (growth) have been defined: human capability, natural resources, production of capital and technology (Samuelson, 2000). Unlike production, consumption is physical expenditure, or expenditure of products and services for the purpose for which they were intended. It satisfies the needs that have caused the purchase of these same products (Bazala, 1991).

Competitiveness based on increased domestic furniture production, the quality of raw material potential, long-lasting tradition in wood processing and a rising trend in the use of wood as an ecological and renewable material are very important elements in increased production and total income from Croatian wood industry in future periods.

The goal of this work is to determine production and consumption trends in DD 20 and DN 36 fields for the period of five years (from 2004 to 2009). Another goal is to establish production and consumption ratios in the mentioned fields to serve as a basis for the competitiveness of domestic manufacturers on the Croatian furniture and other wood products market.

2. MATERIALS AND METHODS

For the needs of this work, data on production, export and import were taken from the field of wood processing and furniture production. Based on the National Activity Classification (Regulation on the Classification of Business Subjects according to the National Activity Classification NKD 2002, Official Gazette 52/2003), these data were divided into export and import in the DD 20 field – *Wood processing and wood and cork products production*, and production, export and import in the DN 36 field

– *Furniture manufacture and other processing industries*. Export and import data from the above fields were taken from the State Bureau of Statistics of the Republic of Croatia, while production data from these fields were taken from the Financial Agency of the Republic of Croatia. Research, undertaken for the period 2004 to 2009, is aimed at assessing consumption in the above fields.

Consumption of wood and different wood products for a particular year was calculated on the basis of so-called derived consumption. The method involved adding total import of the DD 20 field to total production of the DD 20 field and subtracting export value of the DD 20 field.

Furniture consumption for the observed years was also calculated on the basis of so-called derived consumption by adding total import of the DN 36 field to total production of the DN 36 field and subtracting export value of the DN 36 field.

The obtained production and consumption values are expressed in monetary amounts (EUR).

3. RESULTS

Figure 1 shows the ratio between furniture production and consumption in the Republic of Croatia for the period 2004 – 2009, as well as trends in furniture production and consumption. Although the values of furniture production in the observed years were lower compared to the values of furniture consumption, both furniture production and furniture consumption manifested a rising trend.

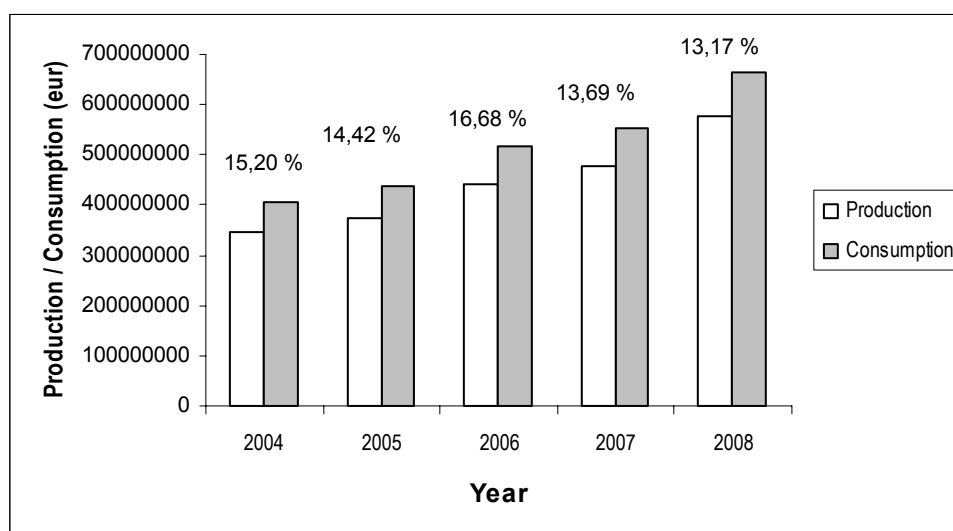


Figure 1. Furniture production and consumption ratio from 2004 to 2009

In terms of the furniture production and consumption ratio in the observed years, according to Figure 1, the ratio between production and consumption was the lowest in 2008, when furniture production, compared to consumption, showed a decrease of 13.17%, followed by 2007, when furniture consumption was 13.69% lower than production. The year 2007 is followed by the years 2005 and 2006, in which furniture production, in relation to consumption, was lower by 14.42% and 14.68% respectively. The biggest difference in the furniture production and consumption ratio, amounting to 15.20%, was found in the year 2004.

In view of the above, it is clear that the value of furniture manufacture is increasing year by year, which is a positive indicator of the development of the Croatian furniture industry, but production is still insufficient to satisfy all market demands, as seen from the value ratio of production and consumption. The obtained results also indicate the following: furniture import from other European and world countries into the Republic of Croatia has an important role.

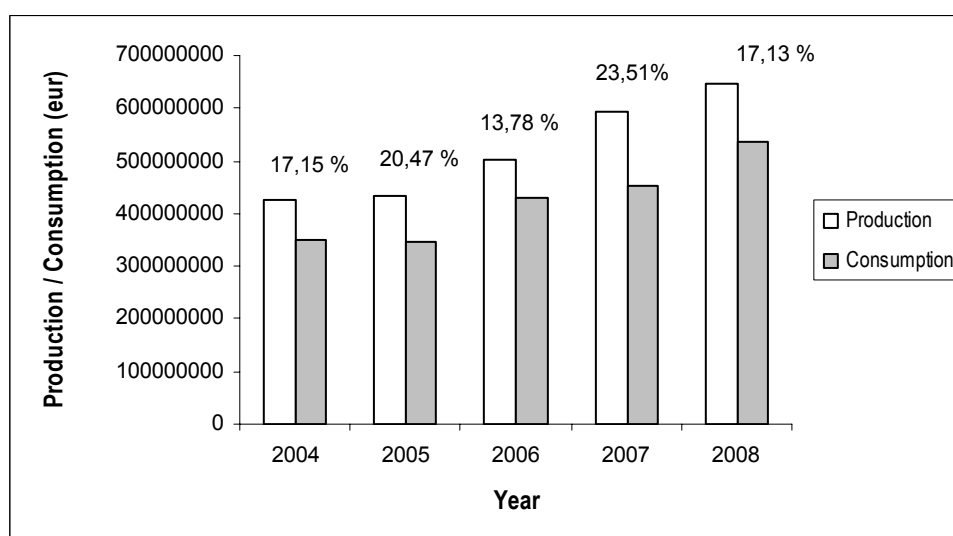


Figure 2. Production and consumption ratio of other wood products from 2004 to 2009

Figure 2 shows trends in the production and consumption of other wood products in the Republic of Croatia in the past five years, as well as production and consumption ratios in the same period. According to the figure, production and consumption ratios are contrary to furniture production and consumption ratios. Production values of other wood products are higher in relation to consumption values of the mentioned products.

In relation to value ratios between production and consumption in the DD20 field, the production and consumption ratio of other wood products was the lowest in 2006, when the production of other wood products exceeded their consumption by 13.78%. In 2004 and 2008, this ratio was 17.13% and 17.15% respectively. In 2005, the production of other wood products was 20.47% higher than their consumption, while the biggest difference in the production and consumption of other wood products was found in 2007. In this year the production of other wood products was 23.51% higher than consumption.

The obtained results are not positive for the Croatian wood industry because they suggest that a part of the production of other wood products, which exceed consumption in the Republic of Croatia, is exported. Production and consumption trends of other wood products in the observed period are positive; in other words, production and consumption values increase from year to year.

Table 1. Production and consumption ratio of furniture and other wood products in euro from 2004 to 2009

| Furniture DN 36 | Production | Consumption | Ratio of production and consumption | Other Wood Products DD 20 | Production | Consumption | Ratio of production and consumption |
|----------------------------|------------|-------------|-------------------------------------------|----------------------------------------------|------------|-------------|-------------------------------------------|
| (year) | (eur) | (eur) | | (year) | (eur) | (eur) | |
| 2004 | 344606436 | 406380829 | 85 | 2004 | 424222056 | 351452443 | 121 |
| 2005 | 374446079 | 437552750 | 86 | 2005 | 434535619 | 345591915 | 126 |
| 2006 | 442243295 | 518353825 | 85 | 2006 | 500542116 | 431572516 | 116 |
| 2007 | 478547425 | 554479736 | 86 | 2007 | 592522184 | 453196124 | 131 |
| 2008 | 578220294 | 665960335 | 87 | 2008 | 648336091 | 537256979 | 121 |

The ratios and trends in the production and consumption of furniture and other wood products in the Republic of Croatia, Figures 1 and 2, are complemented by the established ratios between production and consumption values shown in Table 1.

Furniture production and consumption ratios for all the observed years amount to between 85 and 87. In 2004 and 2006, the ratio between furniture production and consumption was 85, in 2005 and 2007 it was 86, while in the year 2008 it amounted to 87. All these ratios are lower than 100, suggesting that the value of furniture production in the observed years was lower than the consumption value.

Production and consumption ratios of other wood products in the period 2004 – 2009 were between 116, which is the lowest ratio obtained for the year 2006 and 131 (the highest production and consumption ratio in the year 2007). Between the minimal and maximal ratios, the ratios between production and consumption of other wood products amounted to 121 in 2004 and 2008, and 126 in 2005. All these ratios are higher than 100, suggesting that all production values of other wood products were higher in relation to consumption values for the period from 2004 to 2009.

4. CONCLUSION

In spite of the very high quality of raw wood material and tradition in furniture manufacture, the Republic of Croatia does not satisfy growing demands for furniture. The average ratio between furniture production and consumption in the observed period is 85.5.

In the observed five-year period the average furniture production was lower by 14.24% in relation to consumption, while the average production of other wood products was higher by 18.41% in relation to consumption.

Products classed into the DD 20 field according to the National Activity Classification - Other Wood Products, generate lower added value in relation to products from the DN36 field – Wood Processing and Furniture Production. The average ratio between production and consumption in the five-year period is 123.

Compared to 2004, furniture production increased by 233,606,436 euro or 59.60% in 2008. Consumption also increased by 61.02% or 259,279,506 euro.

The production of other wood products in the period 2004 to 2009 increased by 65.43% or by 224,114,035 euro. The consumption of other wood products also increased by 65.42% or by 185,804,536 euro in the mentioned period.

It can be concluded that the Croatian furniture industry is not sufficiently competitive on the domestic market. The reasons for this are not the Croatian products themselves, since these same products find their buyers abroad. The primary reason is the poor offer of Croatian furniture in the stores. Namely the largest furniture stores are, as a rule, owned by foreign market chains, which give preference to products manufactured by their national manufacturers.

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EFFECTS OF PURCHASE DECISIONS WHEN BUYING FURNITURE

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ABSTRACT

In the research we were finding out influences on consumer behavior in furniture purchases. In each stage of consumer behavior, we were asking the consumers about their wishes, needs and habits, and got interesting answers, which can serve the producers and suppliers of furniture as a tool in discovering more successful ways of satisfying the customers' needs and efficient forming the marketing network.

Key words: timber company, furniture sale, consumers, consumer behavior

1. INTRODUCTION

The process of consumer behavior consists of 5 steps, made by consumers while deciding which product to buy. First step is recognition of needs; followed by search for information, evaluation of alternatives, than purchase decision, and the last step is after-sale evaluation. The final, realized purchase is therefore only one stage in the process of consumer behavior and the process can also be terminated, before the consumer reaches this stage. Several factors influence the consumer process. The most important among them are motivation, pressure from the environment and the company's marketing activities. If it's about purchasing products of greater value, which is the category of furniture, the consumer accepts decisions very rationally and deliberately. This means, that he is checking and evaluating the functional benefits of the product (Kotler, 1994).

2. METHOD OF APPROACH

Research of consumers' needs and wishes was implemented with questionnaire method. We inquired 131 potential furniture buyers, 74 of which were male and 57 of which were female. Their educational structure was the following: 2 of them have a master or PhD, 45 have VII: or VI: level of education (higher education), 60 have high school education, 19 with specialized school and 5 with primary school. All inquired persons were older than 25, which strengthened the relevance of the results, as younger people rarely consider buying furniture.

3. RESULTS AND DISCUSSION

3.1. Recognizing the needs

Process of consumer behavior starts, when the consumer discovers the need or wish for a certain product. This is the first and decisive step in the process of consumer behavior. The company can and must participate actively in this process. First it must figure out, if the non-activity or non-interest of buyers for the products it's selling is the consequence of the fact that consumers do not feel the need for these products, or are they not interested in purchase, even if they have the need. In both cases, the company can initiate this phase with its activities. In the first case it must prepare marketing strategies that create needs, and in the second case it must prepare strategies that encourage the

customer to buy products, which will satisfy their needs. The company's marketing activities must inform the customers about existing products of which they are not yet familiar (Potočnik, 2002).

We prepared three questions in order to discover, how the consumers recognize the needs or wishes for purchase of furniture. With the first question we wanted to find out, if the non-interest of customers to buy furniture is a consequence of the fact that they do not feel the need to buy those products, or maybe they have the need, but they are simply not interested in purchase. The answers are shown in Figure 1.

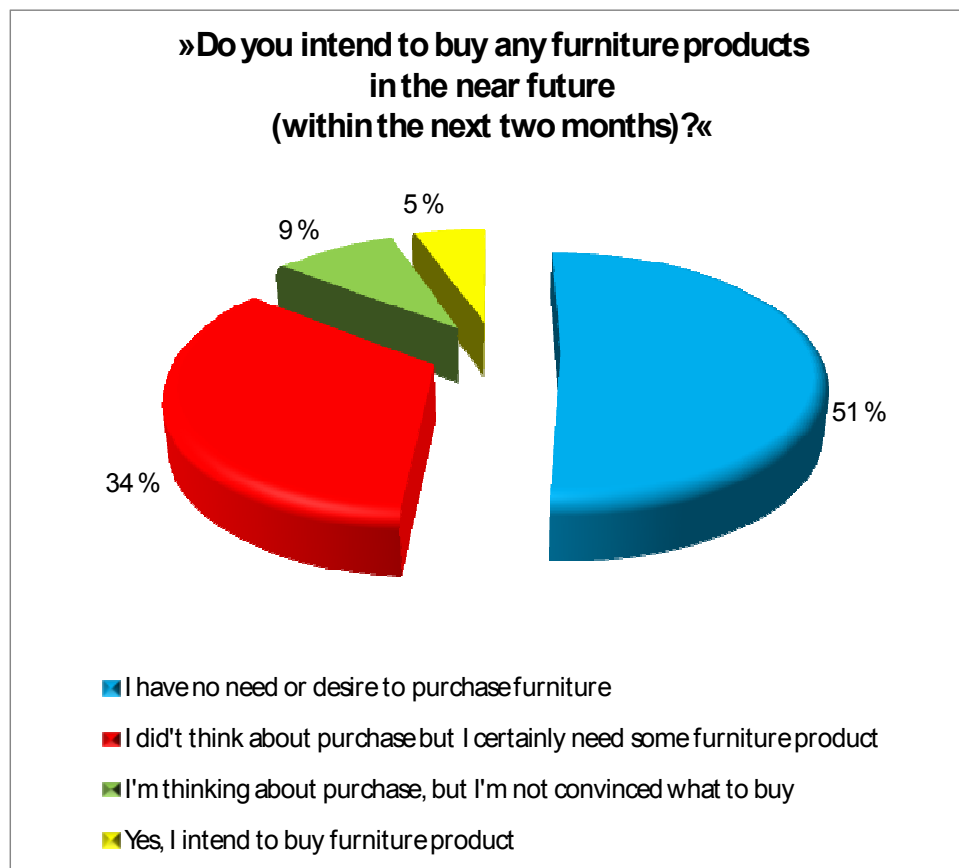


Figure 1: Answers to the question:
»Do you intend to buy any furniture products in the near future (within the next two months)?«

The results show, that almost half of the sample (48%) are potential buyers of furniture. Especially interesting is the group of people (34%), which is currently not considering to purchase any furniture, but the company could convince them to purchase furniture with correctly prepared components of marketing-communication network. Even easier to convince are those inquired (9%), which have answered, that they are already thinking about the purchase, but are not sure if they are going to implement it in the end.

Second question in connection with need identification was: »Have you ever bought a furniture product that you didn't really need?«. The answers are displayed in Figure 2.



Figure 2: Answers to the question:
»Have you ever bought a furniture product that you didn't really need?«

27% of people already bought furniture products that they didn't really need. This data was followed by logical question: "Why did you decide to buy a furniture product that you didn't need?" This was answered only by the enquired people who answered affirmatively to the previous question. The results are displayed in Figure 3.

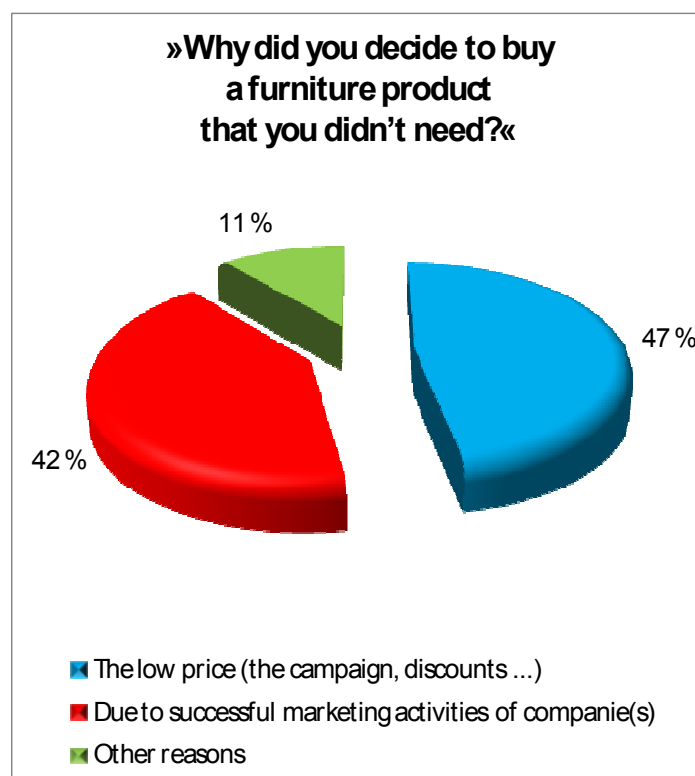


Figure 3: Answers to the question:
»Why did you decide to buy a furniture product that you didn't need?«

The results are showing that with successful advertising and other marketing activities the company can also convince a certain percentage of customers that don't need furniture to buy it anyway.

3.2. Search for information

The second step in the process of consumer behavior is the search for information. When the consumer feels the need for a certain product, we will seek information about different alternatives or variants. This information is normally related to price, quality, characteristics and availability or delivery time of the product. Other important information is about warranty, service, after-sale activities etc. In this phase, the company can take active part and give the consumers information in the form of useful, precise and comprehensible information about products. The consumers are normally looking for information through acquaintances, family and friends. This information has a very strong influence on purchase decisions according to the research. Other important source of information is media (television, radio, internet, magazines, newspapers etc.). In this phase of consumer decision, also salesmen can have a decisive part.

We asked the respondents, where are they looking for information about furniture that they intend to buy. The answers to this question are displayed in Figure 4.

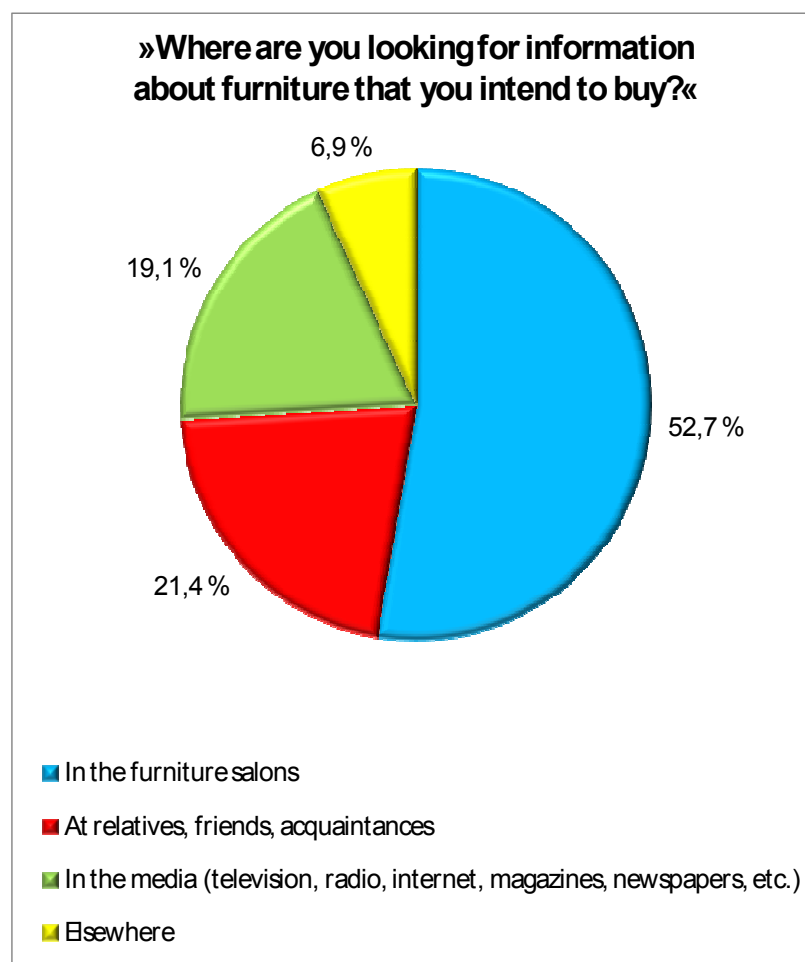


Figure 4: Answers to the question:
»Where are you looking for information about furniture that you intend to buy?«

Furniture is a product that most people still want to see and if possible try out before purchase. Therefore the potential customers most often seek for information directly in the furniture saloons. In that case, properly motivated and professionally trained sales personnel can play a key part.

3.3. Evaluation of alternatives

When the customer collects enough information, he will decide on products that could satisfy his need. Among these products or salesmen, which present the alternatives, he will try to choose the one that suits him the most. With this intention he forms the criteria by which he compares the characteristics of each product. Of course some of these criteria are more important and given more value than others. Normally the most important are price and quality, and with some customers there are also other decisive criteria (for example trademark). When evaluating the alternatives the sales personnel can play a very important part. Often the consumers are not sure about their decision and a good salesman can convince a hesitating customer to buy a certain product.

We also wanted to know the main and the most important criteria, by which the potential buyers compare the characteristics of every product. The results are displayed in Figure 5.

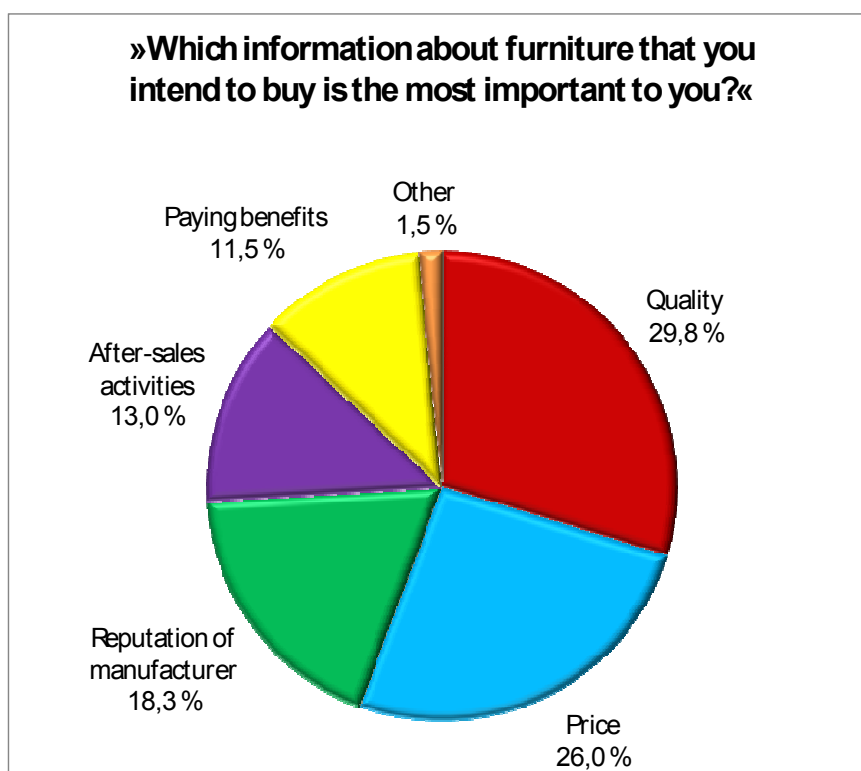


Figure 5: Answers to the question:
»Which information about furniture that you intend to buy is the most important to you?«

As expected, the most important criteria for purchase are price and quality of the furniture. Maybe it is also interesting, that according to the results of the questionnaire the quality is slightly more important than the price. Reputation (image) of the producer is also important, and many also consider the differences in after-sale activities, such as delivery and assembly of furniture and payment facilities, as important criteria.

3.4. Purchase decision

This is the step where the consumer accepts the decision about product purchase. In some cases, this degree includes negotiations between consumer and salesman considering sales conditions, especially the price, time and terms of payment, warranty, delivery time etc. If the purchase conditions are acceptable for the consumer, the actual purchase takes place.

Companies will surely find it interesting to know who is deciding about furniture purchase, mostly from the marketing communication point of view. We asked also this question, and the results are displayed in Figure 6.

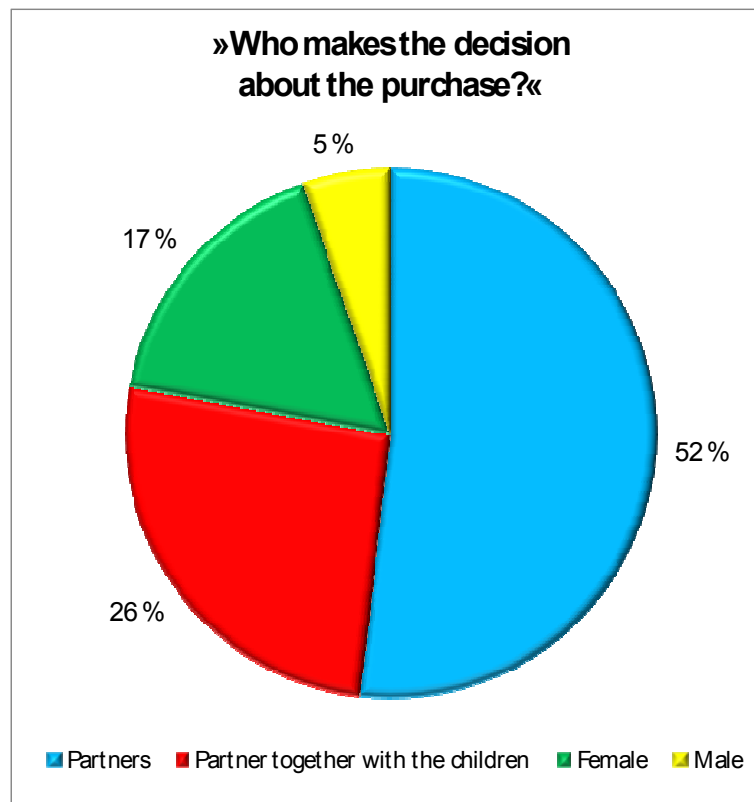


Figure 6: Answers to the question:
»Who makes the decision about the purchase?«

The results show that in more than half cases (52 %) the decision about furniture purchase is made by both partners together. As surprisingly large part of the respondents also makes decisions together with children (26 %). After a conversation with respondents we realized that this big percentage should be attributed to purchases of children's bedrooms. An interesting data is also the fact that a very low percentage of males (5 %) make the furniture purchase decisions by themselves.

3.5. After-sale evaluation

When the consumer buys the product, he starts evaluating it. This is a comparison of expectations with actual effect of the product. The result is either satisfaction or dissatisfaction. The future consumer choices depend on this result. If the consumer is satisfied with the product, he will continue to buy the products of this company, and also inform his acquaintances about it. This statement is confirmed by answers to the question, shown on Figure 7. In the opposite case, the consumer will also inform others about problems and bad purchase decision.

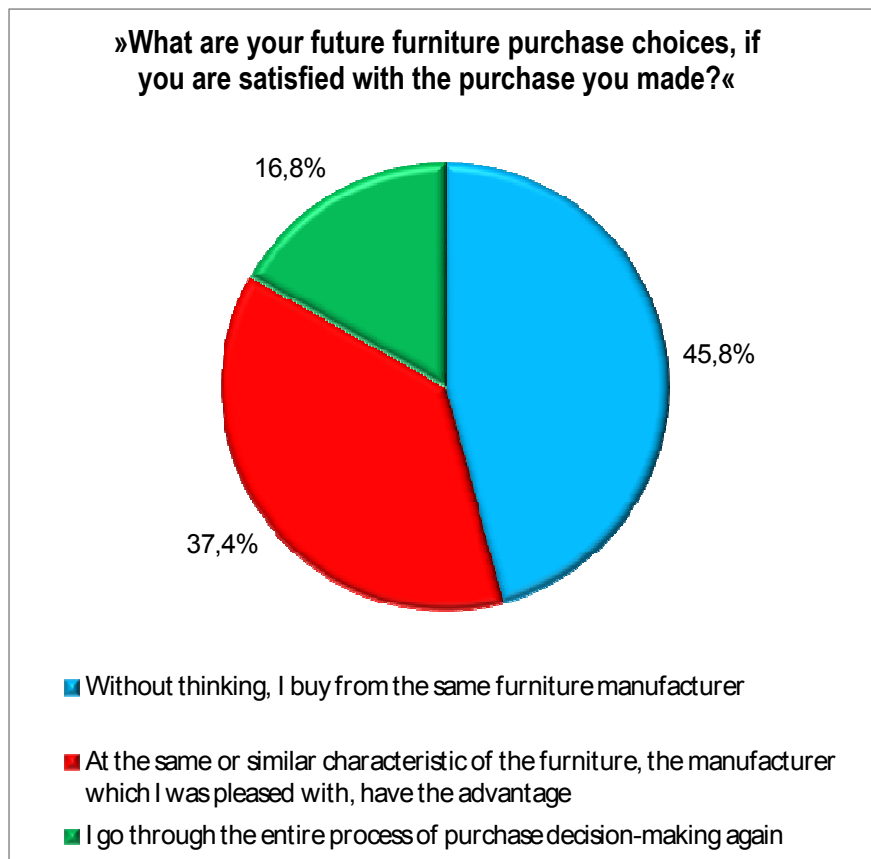


Figure 7: Answers to the question:

»What are your future furniture purchase choices, if you are satisfied with the purchase you made?«

Since it is easier and cheaper to keep the existing customers than to acquire new ones, the companies should be aware of the fact, that there is also a fifth phase in consumer decision making process, and we call it after-sale evaluation. This phase often decides, whether the customers will stay with us. 46% of respondents answered, that if they are satisfied with the purchased furniture, they buy the same producer's furniture at the next purchase without any reflection.

4. CONCLUSIONS

Understanding the consumer behavior and decisions is of key importance for every company. Only on this basis, the company can make a marketing network of products and services that will satisfy the needs and wishes of customers. The process of consumer decision making goes through 5 steps: recognizing the needs, search for information, evaluation of alternatives, purchase decision and after-sale evaluation. The company must know what the consumers' behavior will be in each of the listed degrees, and also know the factors with which it can influence the consumers on individual levels. In this research we were finding out the influences on consumer's behavior in furniture purchase.

When asked, if they intend to buy any furniture products in the near future, 34 % of the respondents answered, that they are currently not considering the purchase, but they would surely need some piece of furniture. This means, that the company with properly prepared contents of marketing-communication network could convince those consumers to purchase furniture. This is also confirmed by the fact that 27 % of respondents already bought furniture products that they didn't need, and they did it exactly because of successful marketing activities of the company or because of low prices.

Potential furniture buyers are most often looking for information directly at furniture saloons, and essentially smaller part seeks information at acquaintances, friends and family or media. The most important criteria in decisions on furniture purchase are the quality and the price of the furniture. Other important criteria are the reputations of the manufacturer, after-sale activities and payment benefits. Purchase decision is most often (in 52 % of cases) made by both partners together. In deciding on children bedrooms' furniture, also the children often participate in decision making. Men rarely accept the purchase decision by themselves (5 % cases). If the customers are satisfied with the purchase, they seldom (in 17 % of cases) go through the whole process of purchase decision at the next furniture purchase. Most decide to buy the furniture of the producer with which they were satisfied at their previous purchase.

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Chapter 2.

ECONOMICS AND INVESTMENTS

DECREASING INVESTMENT RATES IN THE SLOVAK REPUBLIC WOOD-PROCESSING INDUSTRY AS A RESULT OF THE GLOBAL ECONOMIC CRISIS

Josef Drábek, Martina Merková

ABSTRACT:

Investment in economy of each country as well as each enterprise relates dominantly with its efficiency. Economic trend in most of companies in Slovak wood-processing industry determine significant decreasing of efficiency in period 2008. This fact has negative impact into investment rate. What is the way, possibilities of steady enterprises efficiency and stable investment in wood-processing industry is analyzed in this paper.

Key words: investment, economic crisis, enterprise efficiency, added value, wood-processing industry

INTRODUCTION

Wood-processing industry (WPI) of Slovakia in the last period (2002-2007) developed positively and especially because of its comparative advantages - quality raw material, its availability, recoverability, skills, labour sources, traditions, etc. Not only comparative advantages, but also the stability of the economy, its positive growth as well as other incentives to increase interest of foreign investors to invest in wood processing industry. However, in 2008, particularly in the second half most of business entities in the WPI as a whole - the wood industry (WI), the furniture industry (FI) and the pulp and paper industry (PI) signaled the decline in demand as the global financial influence also in the next period of economic crisis. What are the background of the situation, respectively such action is necessary to stabilize the WPI economy and its further positive impact on the Slovak economy, we analyze in our work.

1. DEVELOPMENT OF THE WOOD-PROCESSING INDUSTRY IN SLOVAK REPUBLIC IN THE YEARS 2000-2007

As we noted in the introduction, the interest of foreign investors and domestic business sector to increase interest in the processing of available raw materials from forestry of the SR and recovery path sophisticating of final production. As documented in Table 1, the development of dominant indicators was essentially an upward trend. It is clear that the largest share of wood processing economic indicators, the contribution to GDP growth of Slovakia has in long term the pulp and paper industry. However, it should be noted that investment in the wood industry to increase, positively influenced the increase in value added, as well as the degree of recovery of raw material. It also can evaluate the positive impact of investment on the growth of labor productivity.

Table 1. Development of selected indicators of WPI SR in the years 2000-2007

| Indicator | Unit | Branch | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 |
|------------------------------------------|-----------|------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|----------------|
| Turnover | Mill. SKK | 20-WI | 8 790 | 9 872 | 11 305 | 11 144 | 12 554 | 15 508 | 17 646 | 20 455 |
| | | 361-FI | 10 125 | 13 874 | 20 230 | 26 735 | 27 830 | 28 832 | 29 303 | 38 691 |
| | | 21-PI | 28 949 | 32 939 | 32 899 | 31 108 | 32 652 | 32 629 | 36 247 | 42 624 |
| | | WPI | 47 863 | 56 685 | 64 434 | 68 987 | 73 036 | 76 969 | 83 195 | 101 770 |
| Costs | Mill. SKK | 20-WI | 11 199 | 11 859 | 13 718 | 15 197 | 16 451 | 19 166 | 21 744 | 23 284 |
| | | 361-FI | 12 399 | 16 459 | 25 056 | 31 358 | 29 996 | 31 439 | 31 615 | 44 476 |
| | | 21-PI | 33 732 | 34 939 | 32 768 | 33 463 | 38 787 | 43 635 | 46 603 | 44 785 |
| | | WPI | 57 330 | 63 256 | 71 542 | 80 017 | 85 234 | 94 241 | 99 962 | 112 545 |
| Profit before tax | Mill. SKK | 20-WI | 126 | -22 | 243 | -201 | 687 | 774 | 1 108 | 925 |
| | | 361-FI | 164 | -288 | -2 631 | 741 | 180 | 1 561 | 1 200 | 458 |
| | | 21-PI | 2 170 | 4 167 | 4 608 | 2 746 | 1 171 | 1 708 | 2 896 | 2 445 |
| | | WPI | 2 460 | 3 857 | 2 220 | 3 286 | 2 037 | 4 043 | 5 204 | 3 828 |
| Salaries | Mill. SKK | 20-WI | 1 275 | 1 270 | 1 351 | 1 263 | 1 331 | 1 566 | 1 706 | 1 857 |
| | | 361-FI | 1 149 | 1 404 | 1 643 | 1 897 | 2 156 | 2 441 | 2 952 | 3 628 |
| | | 21-PI | 1 748 | 1 859 | 1 972 | 1 904 | 1 857 | 1 963 | 2 085 | 2 187 |
| | | WPI | 4 172 | 4 533 | 4 966 | 5 065 | 5 344 | 5 970 | 6 743 | 7 672 |
| Added value | Mill. SKK | 20-WI | 2 437 | 2 264 | 2 738 | 2 265 | 3 027 | 3 581 | 4 124 | 3 489 |
| | | 361-FI | 2 252 | 2 501 | 2 313 | 4 390 | 4 581 | 5 355 | 5 958 | 6 090 |
| | | 21-PI | 9 223 | 11 081 | 9 907 | 7 676 | 6 657 | 7 134 | 8 285 | 8 899 |
| | | WPI | 13 912 | 15 846 | 14 958 | 14 331 | 14 265 | 16 071 | 18 367 | 18 478 |
| Investment | Mill. SKK | 20-WI | 881 | 766 | 734 | 1 788 | 1 710 | 2 564 | 2 573 | 6 068 |
| | | 361-FI | 1 572 | 1 645 | 701 | 794 | 1 687 | 2 024 | 2 787 | 4 512 |
| | | 21-PI | 1 594 | 2 205 | 3 083 | 6 634 | 5 161 | 4 744 | 3 185 | 2 796 |
| | | WPI | 4 048 | 4 616 | 4 519 | 9 216 | 8 558 | 9 331 | 8 545 | 13 375 |
| Average number of employees | persons | 20-WI | 10 856 | 10 460 | 10 323 | 9 069 | 8 604 | 9 924 | 9 681 | 9 451 |
| | | 361-FI | 9 079 | 10 043 | 10 410 | 11 015 | 11 158 | 11 830 | 14 240 | 15 970 |
| | | 21-PI | 10 141 | 9 828 | 8 978 | 8 509 | 7 615 | 7 458 | 7 285 | 7 110 |
| | | WPI | 30 075 | 30 331 | 29 710 | 28 592 | 27 377 | 29 212 | 31 206 | 32 531 |
| Investment rate Investment / Turnover | % | 20-WI | 10,02 | 7,76 | 6,49 | 16,04 | 13,62 | 16,53 | 14,58 | 29,67 |
| | | 361-FI | 15,53 | 11,86 | 3,47 | 2,97 | 6,06 | 7,02 | 9,51 | 11,66 |
| | | 21-PI | 5,51 | 6,69 | 9,37 | 21,33 | 15,81 | 14,54 | 8,79 | 6,56 |
| | | WPI | 8,46 | 8,14 | 7,01 | 13,36 | 11,72 | 12,12 | 10,27 | 13,14 |

Source: Data of the Ministry of economy in Slovak Republic

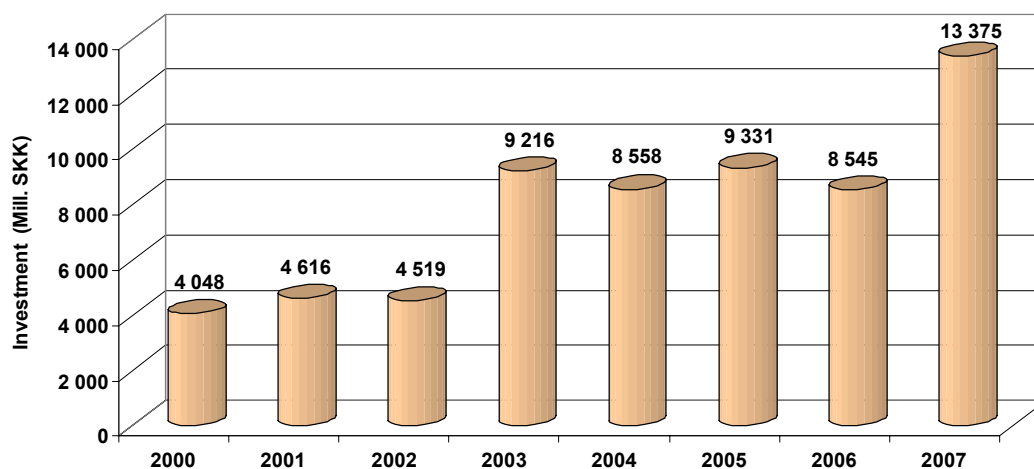


Figure 1. Investment in the wood-processing industry in the years 2000-2007 (mill. SKK)

Source: Data of the Ministry of economy in Slovak Republic

Competitiveness of wood processing and furniture manufacturing

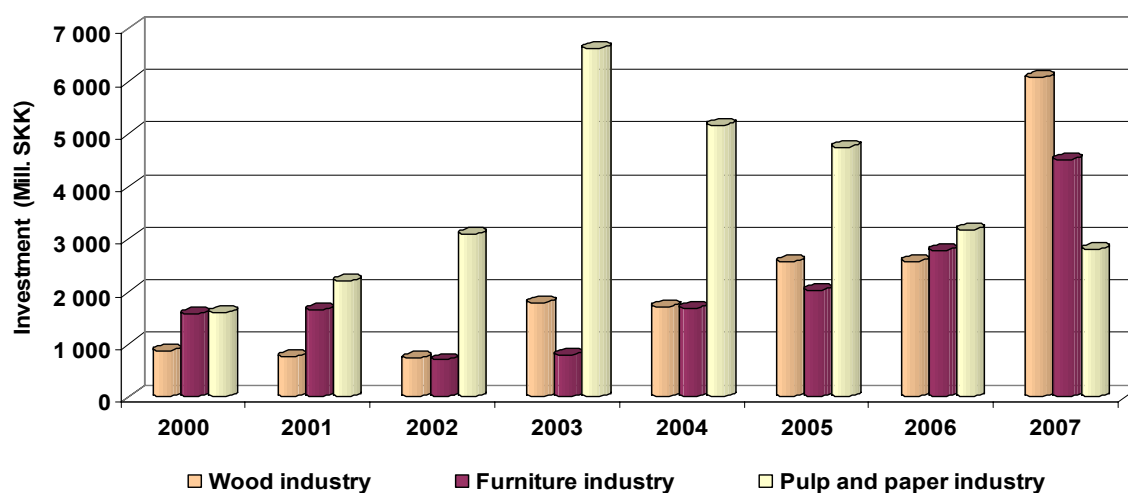


Figure 2. Investment in branches of the wood-processing industry in the years 2000-2007 (mill. SKK)

Source: Data of the Ministry of economy in Slovak Republic

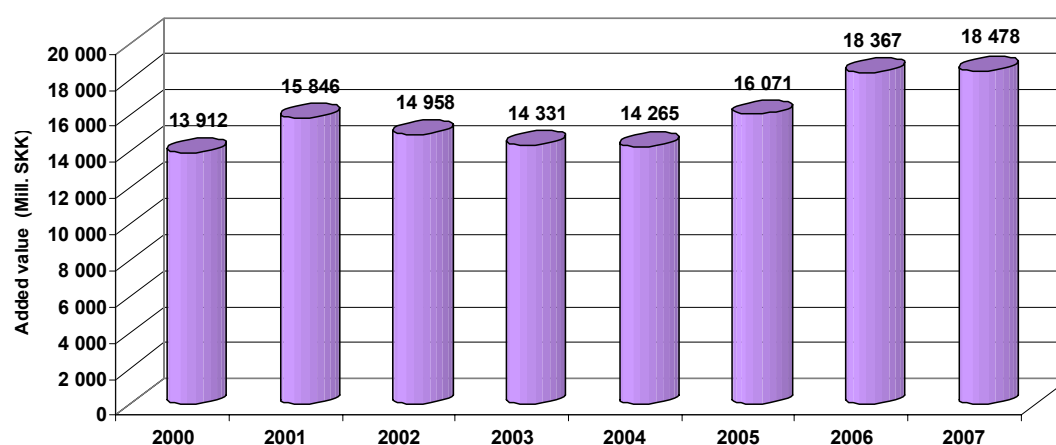


Figure 3. Added value in the wood-processing industry in the years 2000-2007 (mill. SKK)

Source: Data of the Ministry of economy in Slovak Republic

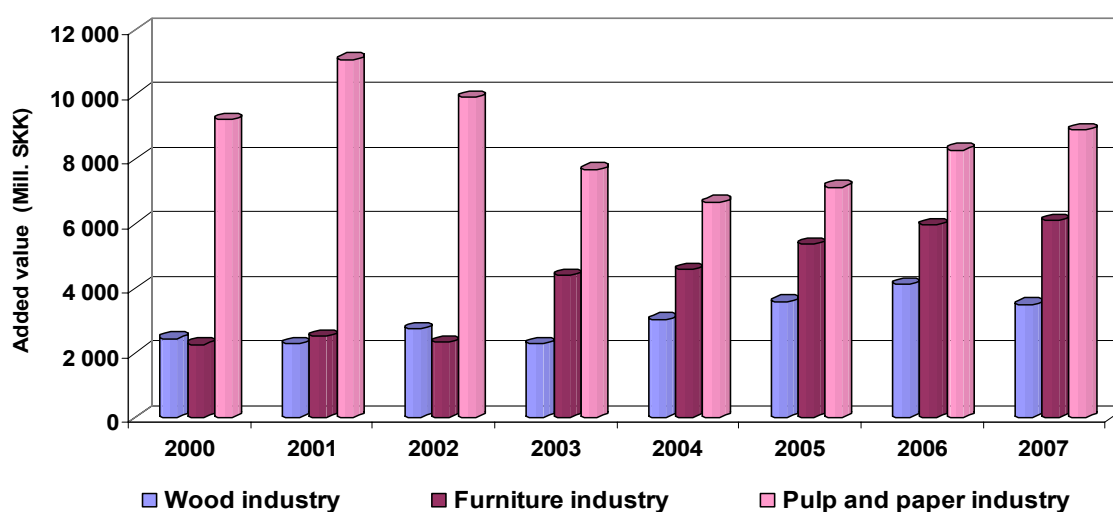


Figure 4. Added value in branches of the wood-processing industry in the years 2000-2007 (mill. SKK)

Source: Data of the Ministry of economy in Slovak Republic

Table 2. Indexes of the annual increase in wood-processing industry in the years 2000-2007

| Indicator | Branch | 2001/2000 | 2002/2001 | 2003/2002 | 2004/2003 | 2005/2004 | 2006/2005 | 2007/2006 |
|-----------------------------|--------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Turnover | 20-WI | 112,3 | 114,5 | 98,6 | 112,7 | 123,5 | 113,8 | 115,9 |
| | 361-FI | 137,0 | 145,8 | 132,2 | 104,1 | 103,6 | 101,6 | 132,0 |
| | 21-PI | 113,8 | 99,9 | 94,6 | 105,0 | 99,9 | 111,1 | 117,6 |
| | WPI | 118,4 | 113,7 | 107,1 | 105,9 | 105,4 | 108,1 | 122,3 |
| Costs | 20-WI | 105,9 | 115,7 | 110,8 | 108,3 | 116,5 | 113,5 | 107,1 |
| | 361-FI | 132,7 | 152,2 | 125,2 | 95,7 | 104,8 | 100,6 | 140,7 |
| | 21-PI | 103,6 | 93,8 | 102,1 | 115,9 | 112,5 | 106,8 | 96,1 |
| | WPI | 110,3 | 113,1 | 111,8 | 106,5 | 110,6 | 106,1 | 112,6 |
| Profit before tax | 20-WI | -17,5 | -1104,5 | -82,7 | -341,8 | 112,7 | 143,2 | 83,5 |
| | 361-FI | -175,6 | 913,5 | -28,2 | 24,3 | 867,2 | 76,9 | 38,2 |
| | 21-PI | 192,0 | 110,6 | 59,6 | 42,6 | 145,9 | 169,6 | 84,4 |
| | WPI | 156,8 | 57,6 | 148,0 | 62,0 | 198,5 | 128,7 | 73,6 |
| Salaries | 20-WI | 99,6 | 106,4 | 93,5 | 105,4 | 117,7 | 108,9 | 108,9 |
| | 361-FI | 122,2 | 117,0 | 115,5 | 113,7 | 113,2 | 120,9 | 122,9 |
| | 21-PI | 106,4 | 106,1 | 96,6 | 97,5 | 105,7 | 106,2 | 104,9 |
| | WPI | 108,7 | 109,6 | 102,0 | 105,5 | 111,7 | 112,9 | 113,8 |
| Added value | 20-WI | 92,9 | 120,9 | 82,7 | 133,6 | 118,3 | 115,2 | 84,6 |
| | 361-FI | 111,1 | 92,5 | 189,8 | 104,4 | 116,9 | 111,3 | 102,2 |
| | 21-PI | 120,1 | 89,4 | 77,5 | 86,7 | 107,2 | 116,1 | 107,4 |
| | WPI | 113,9 | 94,4 | 95,8 | 99,5 | 112,7 | 114,3 | 100,6 |
| Investment | 20-WI | 86,9 | 95,8 | 243,6 | 95,6 | 149,9 | 100,4 | 235,8 |
| | 361-FI | 104,6 | 42,6 | 113,3 | 212,5 | 120,0 | 137,7 | 161,9 |
| | 21-CPI | 138,3 | 139,8 | 215,2 | 77,8 | 91,9 | 67,1 | 87,8 |
| | WPI | 114,0 | 97,9 | 203,9 | 92,9 | 109,0 | 91,6 | 156,5 |
| Average number of employees | 20-WI | 96,4 | 98,7 | 87,9 | 94,9 | 115,3 | 97,6 | 97,6 |
| | 361-FI | 110,6 | 103,7 | 105,8 | 101,3 | 106,0 | 120,4 | 112,1 |
| | 21-PI | 96,9 | 91,4 | 94,8 | 89,5 | 97,9 | 97,7 | 97,6 |
| | WPI | 100,9 | 98,0 | 96,2 | 95,8 | 106,7 | 106,8 | 104,2 |

2. THE IMPACT OF FINANCIAL AND ECONOMIC CRISIS ON THE STABILITY OF THE WOOD-PROCESSING INDUSTRY IN SLOVAK REPUBLIC

WPI positive growth of the past period is not possible to provide a linkage with regard to the construction industry in particular, as well as other sectors of the Slovak economy. Loss of Slovak GDP, its growth rate, reducing income of population will be significantly reflected in the economy of the WPI. It can be noted that although the introduction of the euro in January 1st 2009 created a decent shield toward significant decrease rate of the slovak krown against the euro, but particularly high export performance of WPI (approx. 65-70%) is considerably signed decrease performance, and so the overall economic prosperity of the industry. At the same time, the unilateral orientation in most of the firms to one or two customers in the EU countries are a cause of serious economic problems, and their failure. As documented results in th first quarter of 2009, a significant decrease (from 5 to 100%), which can have a profound impact on the stability of the sector, the available processing resources, as well as significant increase in social instability in various regions of Slovakia (the bankruptcy of enterprises). The implications of the crisis on the performance of the WPI documented Table 3. Those scenarios are based on professional assessment, as well as on the situation of the development in the enterprises to the end of June 2009.

Table 3. The impact of the crisis on the enterprise performance in wood-processing industry

| Indicator | Unit | Branch | Data base in the year 2007 | Optimistic variant Decrease of 20% | Real variant Decrease of 35% | Pessimistic variant Decrease of 50% |
|-----------------------------|-----------|------------|----------------------------|---------------------------------------|---------------------------------|----------------------------------------|
| Turnover | Mill. SKK | 20-WI | 20 455 | 16 364 | 15 341 | 10 228 |
| | | 361-FI | 38 691 | 30 953 | 29 018 | 19 346 |
| | | 21-PI | 42 624 | 34 099 | 31 968 | 21 312 |
| | | WPI | 101 770 | 81 416 | 76 328 | 50 885 |
| Costs | Mill. SKK | 20-WI | 23 284 | 18 627 | 17 463 | 11 642 |
| | | 361-FI | 44 476 | 35 581 | 33 357 | 22 238 |
| | | 21-PI | 44 785 | 35 828 | 33 589 | 22 393 |
| | | WPI | 112 545 | 90 036 | 84 409 | 56 273 |
| Profit before tax | Mill. SKK | 20-WI | 925 | 740 | 694 | 463 |
| | | 361-FI | 458 | 366 | 344 | 229 |
| | | 21-PI | 2 445 | 1 956 | 1 834 | 1 223 |
| | | WPI | 3 828 | 3 062 | 2 871 | 1 914 |
| Salaries | Mill. SKK | 20-WI | 1 857 | 1 486 | 1 393 | 929 |
| | | 361-FI | 3 628 | 2 902 | 2 721 | 1 814 |
| | | 21-PI | 2 187 | 1 750 | 1 640 | 1 094 |
| | | WPI | 7 672 | 6 138 | 5 754 | 3 836 |
| Added value | Mill. SKK | 20-WI | 3 489 | 2 791 | 2 617 | 1 745 |
| | | 361-FI | 6 090 | 4 872 | 4 568 | 3 045 |
| | | 21-PI | 8 899 | 7 119 | 6 674 | 4 450 |
| | | WPI | 18 478 | 14 782 | 13 859 | 9 239 |
| Investment | Mill. SKK | 20-WI | 6 068 | 4 854 | 4 551 | 3 034 |
| | | 361-FI | 4 512 | 3 610 | 3 384 | 2 256 |
| | | 21-PI | 2 796 | 2 237 | 2 097 | 1 398 |
| | | WPI | 13 375 | 10 700 | 10 031 | 6 688 |
| Average number of employees | persons | 20-WI | 9 451 | 7 561 | 7 088 | 4 726 |
| | | 361-FI | 15 970 | 12 776 | 11 978 | 7 985 |
| | | 21-PI | 7 110 | 5 688 | 5 333 | 3 555 |
| | | WPI | 32 531 | 26 025 | 24 398 | 16 266 |

3. MEASURES TO STABILIZE THE ECONOMY OF THE WOOD-PROCESSING INDUSTRY IN SLOVAK REPUBLIC

Measures to reduce the impact of economic crisis formulated by various interest groups in the WPI can be presented as follows:

3.1 Measures of the Association of wood processing manufacturers of the Slovak republic

Phrased measures related to the fact that in past years the Government of SR expressed support of the programme for the development of WPI „Wood - feedstock of 21st century“, but only on the declaratory level, without direct support instruments to ensure the growth of timber recovery in the Slovak Republic. In responding to the crisis in the automotive, mechanical engineering, and so on was proposed by the Association of wood processing manufacturers of the Slovak republic "scrappage bonus" - promoting low-energy and ecological housing based on the wood prefabricated buildings and in the amount of 5.000 € for a one wooden house. The measure should be stabilized wooden-house production, as well as the development of investment in the construction industry in the various regions.

Other measures of the Association of wood processing manufacturers were oriented to promote employment opportunities, promoting incentive interest-free loans for young people in order to increase demand for production, in particular wood and furniture industry. However, it should be noted that the weakness of these proposals was the support from the state, which in a significant decline in performance does not dispose of the required resources from the state budget, which could be used for development of the wood processing branch.

Also, negative actions can be assessed the Ministry of Economy, the current challenges in the operational program „Competitiveness and economic growth“ in the Priority Axis 1 „Innovation and Growth Competitiveness“ removed from the eligible applicants the whole wood industry. Just this industry should have used the resources properly in order to more significant growth of value added.

3.2 Measures of the business entities

Phrased measures of *business entities* are the result of a severe decline in demand at the end of 2008, as well as in the first half of 2009 as follows:

1. significant decrease in the number of workers in the field of production and technical and economic orientation - a decrease in demand for production, to release the workers in the agreement, freelancers, employees in retirement age respectively,
2. significant reduction of stocks - increasing of emergency cash-flow,
3. reduction, respectively freezing the planned investment, which have no impact on the stability of the company in the short term,
4. reduction of expenditures on marketing, education, etc., which again have not short term effect on the growth performance of the enterprise,
5. shortening of working time, respectively production, enabling technology which only provides the current demand for production, the reduction in operating costs, as well as the commitment in the cost of the in-processed production or finished production - again the release of working capital,
6. reduce the cost in business management - it can be one of the last steps before the bankruptcy of the company,
7. further measures aimed at reducing employee benefits, but not significantly affect the anticipated negative economic result of enterprise.

CONCLUSION

Development of WPI as a whole is clearly dependent on changes in demand for production and not only in Europe. If the EU level to adopt targeted and comprehensive measures to support the growth of domestic demands, as well as support construction industry and downstream industries, such measures would certainly have positive impact on the growth of population income and thus growth of its purchasing power. If in the short term will not be driven the demand, it is clear that significantly decrease the performance of the WPI as a whole, which of course in terms of future (min. 5 years) will adversely affect the share of GDP WPI SR, as well as balanced regional development (availability of raw materials), of course having a negative impact on social stability in the individual regions of Slovakia.

For the development of small and medium enterprises in the WPI at the time of economic crisis would certainly help the modernization projects of wear technical and technological base, allowing production to optimum manufacturing costs, increasing value added, as well as job opportunities, increasing the stability of regions. This means that the effective co-financing (up to 50% of eligible expenditures), it is possible to implement projects to the regions for increasing the degree of recovery of wood as well as social stability.

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CLUSTER ANALYSIS OF THE FOREST AND WORKING BASED INDUSTRIES OF THE CARPATHIAN REGION OF UKRAINE

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ABSTRACT

Within the framework of the Swiss-Ukrainian project of development of forestry in Transcarpathian oblast of FORZA his founders joint with the scietists of the National Forestry Technical University of Ukraine, International institute for Forest Ecosystem Management and Timber Utilization University of Muenster (Germany), and also other interested persons and wood based industries fo financing by the Swiss Agency for development and collaboration two years ago began the cluster analysis of forest the of Carpathians region of Ukraine. Two year of work led to that the forest and wood baser industries of this region took ponderable place in the economy of the state, executes the row of important functions the value of which is presently underestimated, and for its strategic development participation of different layers of society – power, business, Community are important. As, one of the vital problem of the day of forest and wood based industry of Carpathians regions Ukraine there is insufficiency of investments, the article is dedicated the analysis of index of investment attractiveness of forest and wood based indastries of Carpathians region of Ukraine.

Key words: cluster, forest and wood based industries, investment attractiveness.

1. OBJECT OF RESEARCHES

The Carpathians region is spread the extreme western part of Ukraine and includes the Lviv, Ivano-Frankivsk, Chernivtsi and Transcarpathian oblasts (fig. 1).



Fig. 1. Region realization cluster analysis

For the calculation of index of investment attractiveness to forest and wood working industries of Carpathians region of Ukraine forestry, woodworking industry, furniture production, pulp and paper industries, is included.

2. METHODS OF RESEARCHES

The determinations of the investment attractiveness index of the forest and wood based industries of an oblast was carried out in a few stages:

1. Data collection by oblast experts (40 indices according to Table 1) for the period from 2002 to 2007 years.
2. Normalization of index values taking into consideration their different scales and proportionality:

$$k_i = (x_i - x_{\min}) / (x_{\max} - x_{\min}) \quad (1)$$

where k_i – normalized index value;
 x_i – natural index value;
 x_{\max} – maximum value of the natural index;
 x_{\min} – minimum value of the natural index.

3. Determination of the coefficient of selective correlation r among every input index and volume of direct foreign investments in normalized values.
4. Determination of the significance of each index:

$$y_i = |r_i| / \sum r_i \quad (2)$$

where y_i - significance of the index;
 r_i - selective correlation coefficient between the index and volume of direct foreign investments;
 $\sum r_i$ – sum of absolute values of correlation coefficients.

5. Determination of the average normalized value of each index:

$$K_i = x_{cp} - x_{\min} / (x_{\max} - x_{\min}) \quad (3)$$

where x_{cp} – average value of the natural index.

6. Determination of the complex integral index of the investment attractiveness of the industrial sector of an oblast:

$$Z = \sum K_i y_i \quad (4)$$

Table 1. Indices for calculating the investment attractiveness of the forest and wood working industries of the oblast

| Code | Name |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | 2 |
| K1.1 | Foreign Direct Investment growth in forestry, thousand US \$ |
| K1.2 | Foreign Direct Investment growth in the timber processing and timber products manufacturing, except furniture, in the oblast, thousand US \$ |
| K1.3 | Foreign Direct Investment growth in the pulp and paper production and publishing in the oblast, thousand US \$ |
| K1.4 | Foreign Direct Investment growth in the furniture production in of the oblast, thousand US \$ |
| K1.5 | Investments into fixed capital in the forestry in the oblast, thousand UAH |
| K1.6 | Investments into fixed capital in the timber processing and wood woodn products manufacturing, except furniture, in the oblast, thousand UAH |
| K1.7 | Investments into fixed capital in the pulp and paper production and publishing in the oblast, thousand UAH |
| K1.8 | Investments into fixed capital in the furniture production in the oblast, thousand UAH |
| K1.9 | Fixed assets value in the forestry in the oblast, thousand UAH |
| K1.10 | Fixed assets value in the timber processing and timber products manufacturing, except furniture, in the oblast, thousand UAH |
| K1.11 | Fixed assets value in the pulp and paper production and publishing in the oblast, thousand UAH |
| K1.12 | Fixed assets value in the furniture manufacturing in the oblast, thousand UAH |
| K1.13 | Coefficient of fixed assets wear in the forestry in the oblast, % |
| K1.14 | Coefficient of fixed assets wear in the timber processing and timber products manufacturing, except furniture, in the oblast, % |
| K1.15 | Coefficient of fixed assets wear in the pulp and paper production and publishing in the oblast, % |
| K1.16 | Coefficient of fixed assets wear in the furniture manufacturing in the oblast, % |
| K1.17 | Coefficient of fixed assets renewal in the forestry in the oblast, % |
| K1.18 | Coefficient of fixed assets renewal in the timber processing and timber products manufacturing, except furniture, in the oblast, % |
| K1.19 | Coefficient of fixed assets renewal in the pulp and paper production and publishing in the oblast, % |

Continuation of table 1.

| | |
|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| K1.20 | Coefficient of fixed assets renewal in the furniture manufacturing of the oblast, % |
| K1.21 | Financial pre-tax results from regular activity in the forestry in the oblast, thousand UAH |
| K1.22 | Financial pre-tax results from regular activity in the timber processing and timber products manufacturing, except furniture, in the oblast, thousand UAH |
| K1.23 | Financial pre-tax results from regular activity in the pulp and paper production and publishing in the oblast, thousand UAH |
| K1.24 | Financial pre-tax results from regular activity in the furniture manufacturing in the oblast, thousand UAH |
| K1.25 | Total assets (liabilities) in the forestry in the oblast, thousand UAH |
| K1.26 | Total assets (liabilities) in the timber processing and timber products manufacturing, except furniture, in the oblast, thousand UAH |
| K1.27 | Total assets (liabilities) in the pulp and paper production and publishing in the oblast, thousand UAH |
| K1.28 | Total assets (liabilities) in the furniture production in the oblast, thousand UAH |
| K1.29 | Operational expenses per one UAH of sold products in the forestry of the oblast, copecks |
| K1.30 | Operational expenses per one UAH of sold products in the timber processing and timber products manufacturing, except furniture, in the oblast, copecks |
| K1.31 | Operational expenses per one UAH of sold products in the pulp and paper production and publishing in the oblast, copecks |
| K1.32 | Operational expenses per one UAH of sold products in the furniture production in the oblast, copecks |
| K1.33 | Share of unprofitable enterprises in the forestry in the oblast, % |
| K1.34 | Share of unprofitable enterprises in the timber processing and timber products manufacturing, except furniture, in the oblast, % |
| K1.35 | Share of unprofitable enterprises in the pulp and paper production and publishing in the oblast, % |
| K1.36 | Share of unprofitable enterprises in the furniture production in the oblast, % |
| K1.37 | Average monthly wages of hired workers in the forestry of the oblast, UAH |
| K1.38 | Average monthly wages of hired workers in the timber processing and timber products manufacturing, except furniture, of the oblast, UAH |
| K1.39 | Average monthly wages of hired workers in the pulp and paper production and publishing of the oblast, UAH |
| K1.40 | Average monthly wages of hired workers in the furniture production in the oblast, UAH |

Results of calculation of investment attractiveness of forest resulted the sector of region are given on fig. 1.

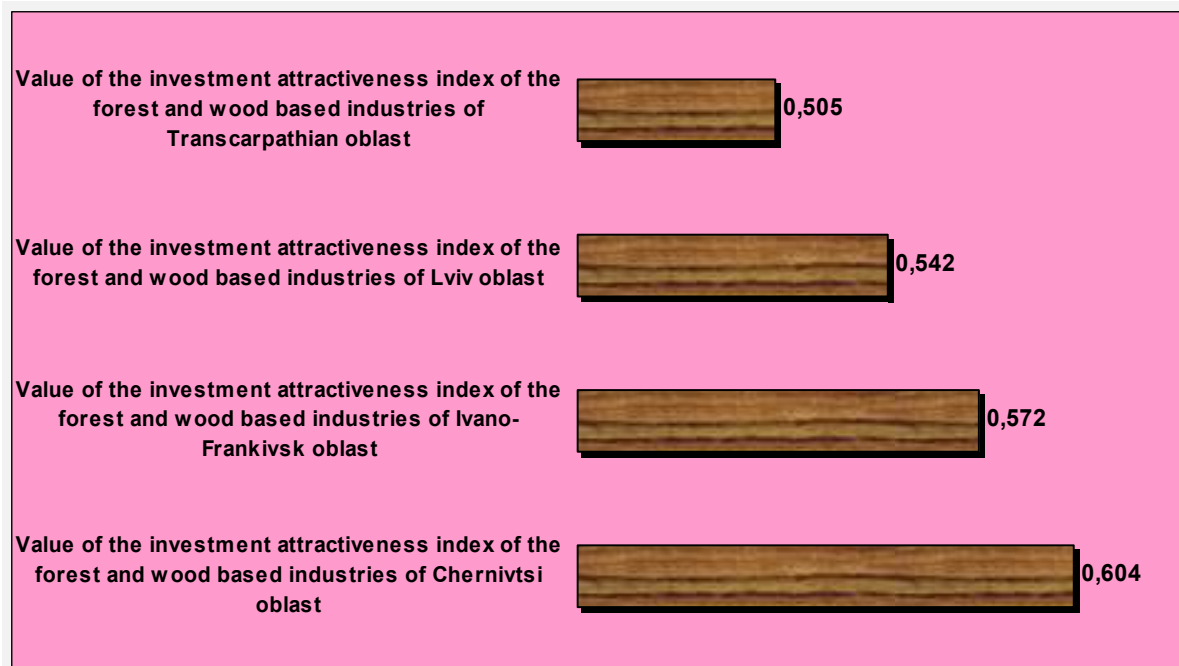


Fig. 1. Value of the investment attractiveness indices of the forest and wood working industries in the oblasts of the Carpathian region of Ukraine.

Also settled accounts after the previous method of value of index of investment attractiveness for four subindustries of every region of Carpathians region of Ukraine (fig. 2 ... fig. 5.)

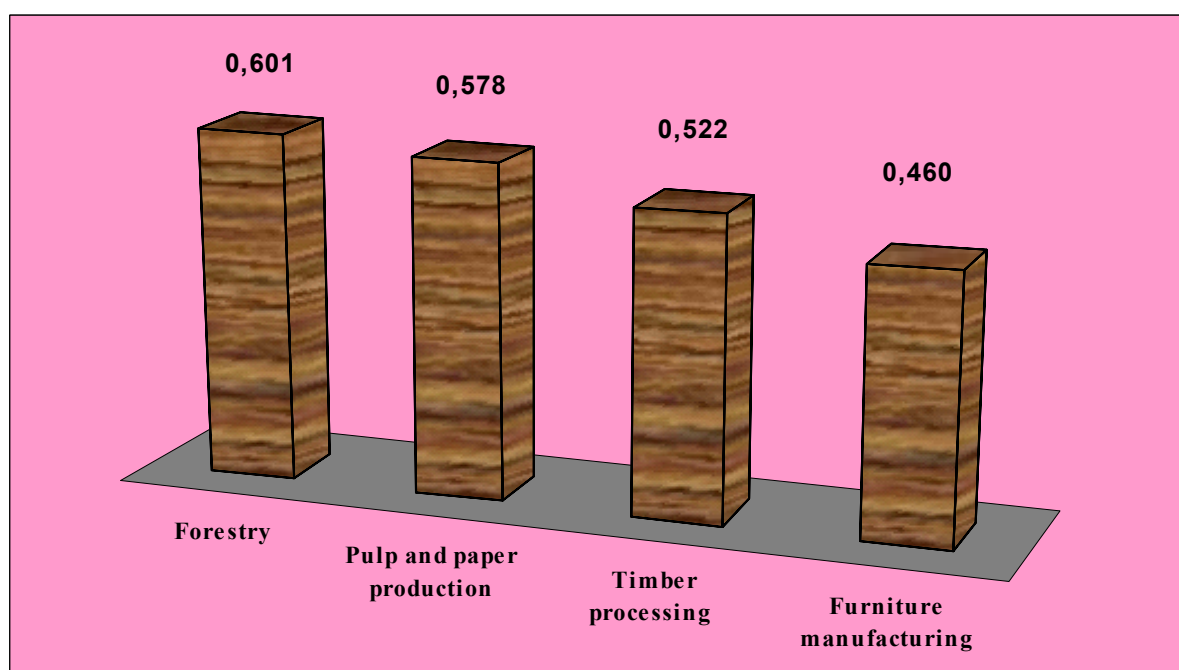


Fig. 2. Value of the investment attractiveness indices of the forest and wood working industries of Lviv oblast.

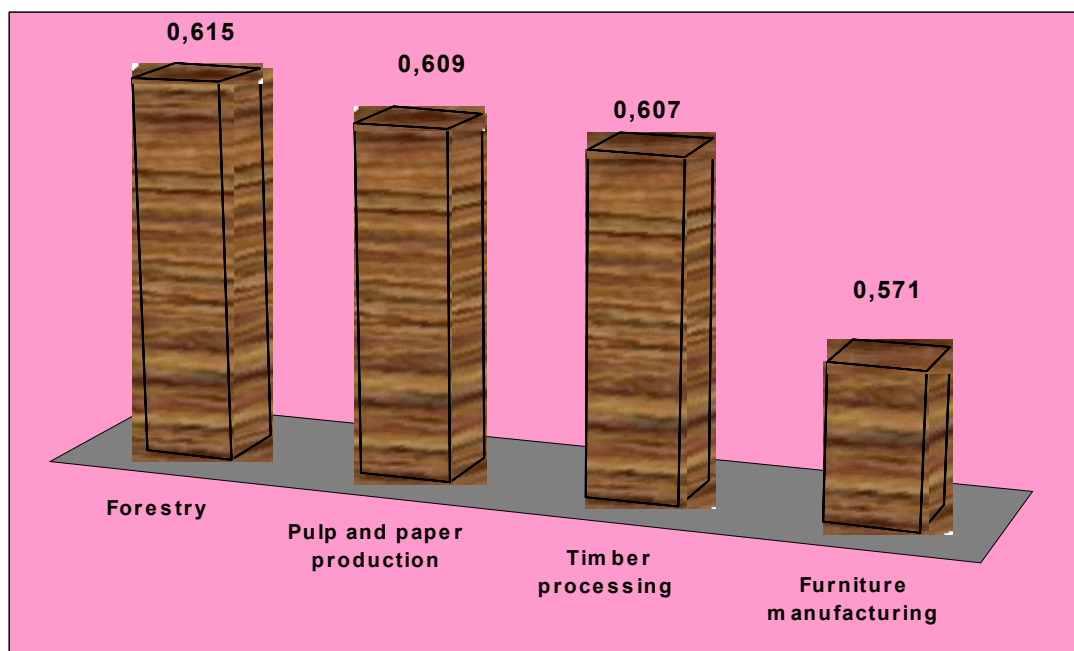


Fig. 3. Value of the investment attractiveness indices of the forest and wood working industries of Chernivtsi oblast

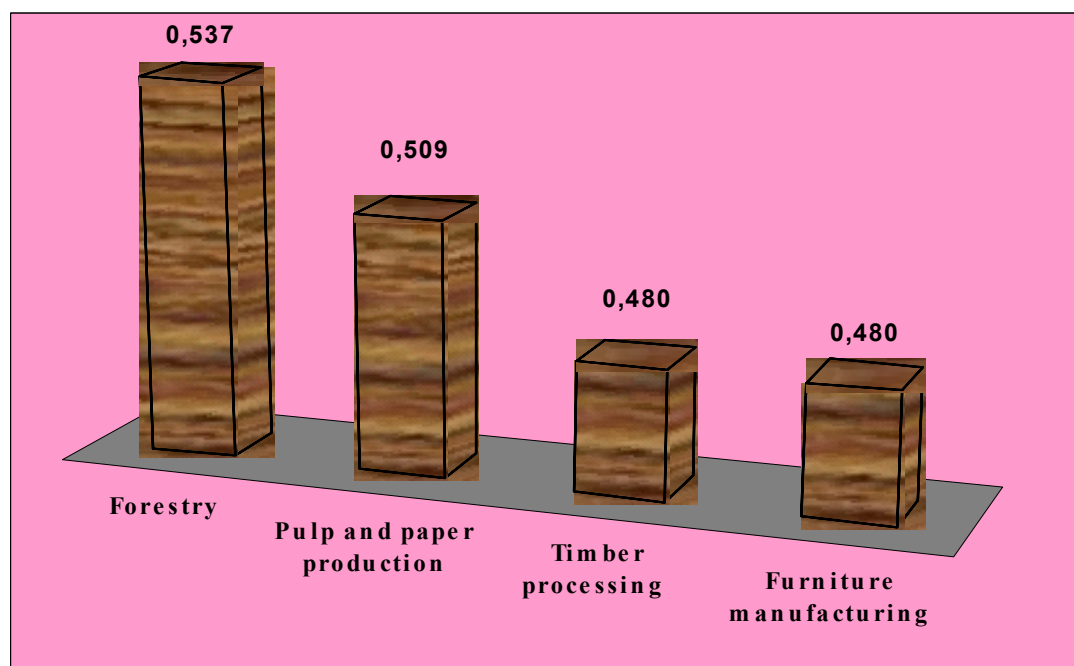


Fig. 4. Value of the investment attractiveness indices of the forest and wood working industries of Transcarpathian oblast.

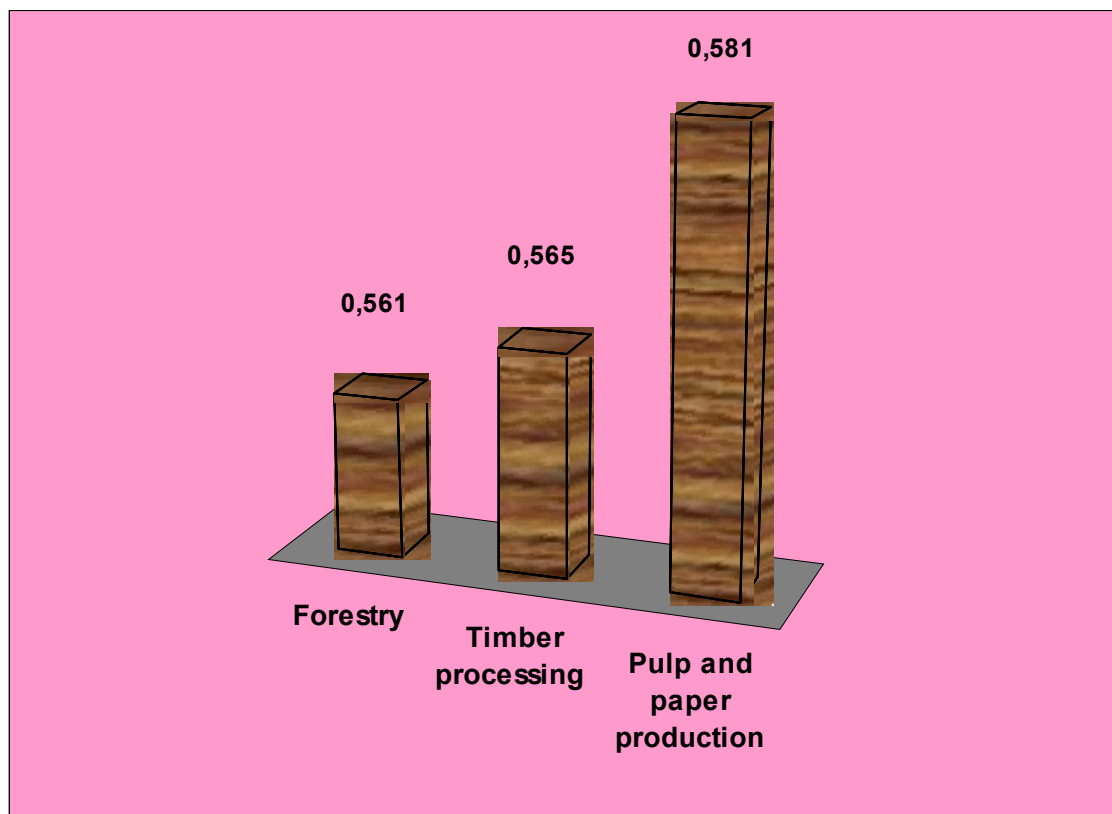


Fig. 5. Value of the investment attractiveness indices of the forest and wood working industries of Ivano-Frankivsk oblast.

CONCLUSIONS

1. In all oblasts of Carpathians region of Ukraine, except for the Ivano-Frankivsk region the value of index of investment attractiveness of forestry is one of the greatest, and value of index of investment attractiveness of furniture – the smallest.
2. Investment attractiveness of forest and wood working industries it is necessary substantially to improve the sector of Carpathians region of Ukraine.
3. Most negatively on the investment attractiveness of forest and wood working industries it is influenced the sector of Carpathians region of Ukraine: investments are in the fixed assets, cost of basic facilities, coefficients of wear and update of basic facilities.

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ECONOMICAL ASPECTS OF PLANTATION MONITORING IN INTEGRATED PEST MANAGEMENT IN BULGARIA

Nikolay Neykov, Angel Petkov, Vladislav Todorov

Monitoring of plantation where IPM is implemented requires exact investments in assets like scanners, computer systems and GPS devices. For each plantation area should be determined exact value of direct investments, additional costs of labor and current assets, which is the main purpose of the article.

INTRODUCTION

The role of Integrated Pest Management (IPM) in promoting the sustainability of agricultural production systems for future generations is based on the premise that implementing its principles is essential to optimizing the sustainability of agricultural systems [2].

Over the last three years in University of Forestry, Bulgaria has been conducted an experiment for early warning of pests assault. The main purpose of this experiment is to provide satisfying information for the next experiments which can be used for determination of economically effective moment for suppressing. Using principles of IPM determination in this moment requires combination of economical approaches for economies determination, information technologies for data transferring and processing, biological approaches for determination of pests and consequent suppressing. All these approaches require consequent technology to be implemented in plantation.

The extended purpose of the article is appropriate investment appreciation which would lay down the perspectives of implementation of system for early alert and determination of the right moment for pest suppress.

1. ECONOMIC ASSESSMENT OF IPM IMPLEMENTATION

Economic assessment of the results of IPM implemented to any plantation will significantly vary. Analysis cannot say which is the best decision for a farmer, homeowner or government official. This would depend on how each person subjectively weighs his or her multiple objectives, but it can indicate trade-offs and opportunity costs that may facilitate decisions [3]. Decision to adopt a particular integrated pest management (IPM) practice will often have to be made before information is available on pest severity [3]. Costs and benefits would depend on the type of pest suppressing or "pest strategy"[5]. This makes analysis of investments very important. It would provide basic information, restrictions and parameters to economies and costs planning before empirical information to be available. Decision to adopt a particular integrated pest management (IPM) practice will often have to be made before information is available on pest severity [3]. Costs and benefits would depend on the type of pest restrictive suppressing or "pest strategy"[5].

Biological monitoring is one of the core components of IPM [1], which makes the system for monitoring one of the main parts of investments in system for IPM.

2. COSTS OF SYSTEM FOR MONITORING AND DECISION MAKING (SMDM)

System which is used for taking the right decisions when to influence on pest attack and how, is shown on fig.1. The main operations conducted in the system are following:

- data collecting from plantation like leaves and meteorological conditions;
- data transferring to information centre;
- processing and analysis;
- decision making and planning pest suppress.

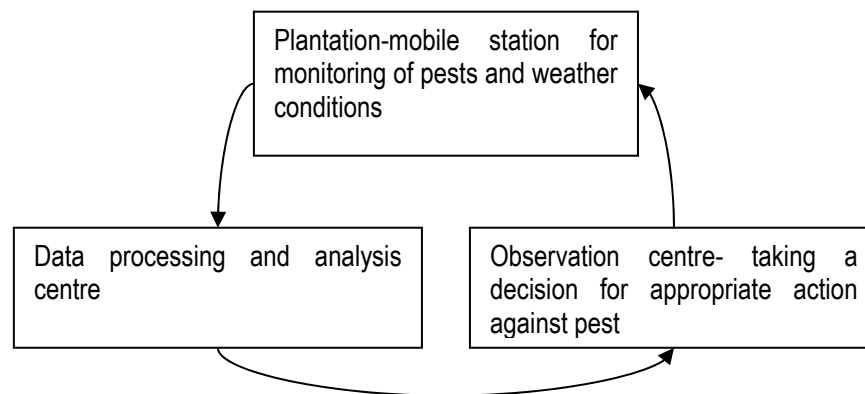


Figure1. Graph of the SMDM

SMDM includes specialists, hardware, software, meteorological devices etc. These elements should provide sufficient information for appropriate decision. System working as follows:

Worker collects leaves from plantation and scans them. Afterwards the information is transferred through Internet to Data Processing and Analysis Centre. Results from analysis are presented to the specialist in Observation centre or get in software to generate decision about the right moment of suppressing. Finally decision is sent to organizational structure, charged with IPM implementation.

Now at the beginning of the experiment the only known parameter is required result of the system. It has to deliver economies in the context of chosen IPM strategy.

Expressed system would cause costs for its establishment and working. The costs are distinguished in two groups like in Thuesen et. al. [4], to initial and permanent.

Minimum initial costs are determined by minimum devices that have to be delivered at the beginning of the implementation of such a system. For now it is not well known how exactly the scale of the system have to vary depending on scale of plantation.

Preliminary costs-on the base of the experiment in the University of Forestry, Bulgaria are following:

- Costs for hardware: geoserver; laptop; PC; scanner; meteorological tools.
- Costs for software: Windows 2003; SPSS; PASW17.
- Annual costs for system working: labor costs; energy costs; maintenance costs etc.

3. INVESTMENT ASSESSMENT APPROACHES

In the paper are used some of the wide spread methods for investment efficiency appreciation like Internal Rate of Return (IRR) and Net Present Value (NPV) [4]. But there are some specific

circumstances. The economies, which should be generated by the SMDM presented here, are not known. Here is suggested an

approach through assets assessment and permanent costs determination to recommend the right investment period and depreciation period. Consistency of the approach is following:

- calculating of required yearly economies, taken like annual incomes to achieve IRR;
- determining the optimal depreciation period of computer devices and meteorological tools;
- determining the risk of future values receiving- this stage calculates all the risks that could interfere the future economies;
- determining the difference between opportunities for generating economies which exceed total loss that could appear by using the exact investment time and the possible additional economies generating.

Analytical models for IRR and NPV are well known. Here is presented an approach for prescreening all available alternatives for investment time period using the probability for exceeding the average economies and probability for loss appearance. The model is following:

$$NB = E[NPV_t] \cdot (1 + P_{NPV_t > E[NPV_t]}) - E[l_t] \cdot P_{NPV_t < 0} \quad (1)$$

where NB is Net Benefits;

NPV_t - Net Present Value for t years of investment period;

$E[l_t]$ - average loss for t years of investment period;

$P_{NPV > E[NPV]}$ - probability NPV to exceed average one for t years of investment period;

$P_{NPV < 0}$ - probability for loss appearance.

4. APPROBATION

All models are approbated for agriculture economic conditions in Republic of Bulgaria. Firstly is determined the interest rate, included in NPV valuation. In Bulgaria the widest spread interest of loans for agriculture is 9%. The most convenient alternative for borrowing is "SAPARD" program. It gives 7 years of loan repayment. Basic parameters of the experiment are:

- 9% interest rate;
- 7 years of maximum investment period;
- overall amount of investment 4464 €;
- all possible and probable loan 1116,12 €;
- annual costs for labor and energy for monitoring 171,26 €.

The first stage is to determine the annual economies to achieve IRR- $NPV=0$. They are calculated in all assets depreciation and only hardware depreciation, shown on figure 2.

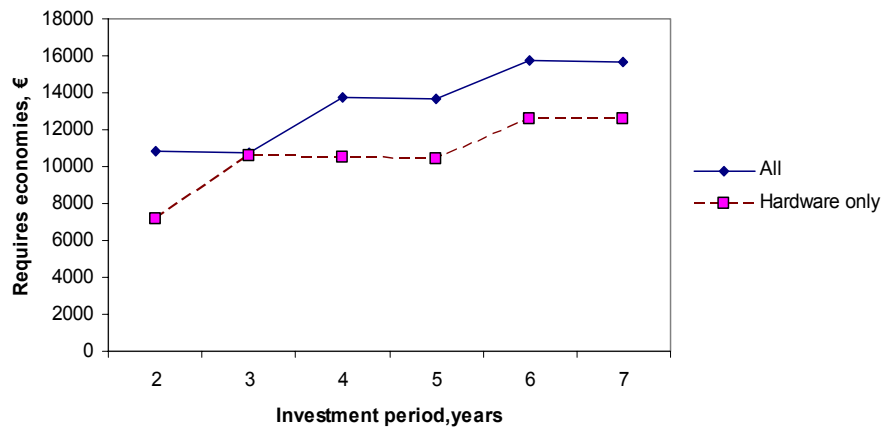


Figure 2. Requirements for annual generated economies

It is clear from figure 1, that second alternative of depreciation is the more effective one. It is not so risky to reinvest in new hardware, than in all assets in use.

Second stage is determination of the most effective depreciation period. For this purpose proportion between annual cash flows and required economies for their derivation is used. Results are: 0,827 for 2 years; 0,76 for 3 years; 0,706 for 4 years; 0,644195332 for 5 years; 0,583 for 6 years and 0,523 for 7 years. The best proportion is for two years depreciation period for both alternatives of depreciation assets amount.

Third and fourth stages are conducted with assistance of Monte Carlo simulation. Several random number generations are made to outline the most efficient alternative for investment and consequent repayment period. Random values for future economies are normally distributed. Values of average economies and their standard deviation are combined in several combinations. Here are used primary average amount (EX-prim) of average economies and their standard deviation(S-prim) and random X and S above, less or equal to primary values. Simulations are shown in table 1

Table 1. Simulated random future economies, generated by SMDM implementation

| | EX=EX-prim | EX>EX-prim | EX<EX-prim | EX=EX-prim | EX=EX-prim | EX<EX-prim | EX>EX-prim | EX<EX-prim | EX>EX-prim |
|---|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| T | S=S-prim | S=S-prim | S=S-prim | S>S-prim | S<S-prim | S<S-prim | S>S-prim | S>S-prim | S<S-prim |
| 2 | 6429,74 | 18652,37 | 5925,11 | 4152,62 | 9655,57 | 5199,62 | 11009,45 | 6269,88 | 15420,01 |
| 3 | 12686,81 | 19291,15 | 3824,57 | 15022,55 | 9134,76 | 5409,14 | 8791,01 | -1739,73 | 16943,30 |
| 4 | 9320,40 | 17577,37 | 3424,86 | 5973,28 | 9748,53 | 5016,85 | 9900,94 | 398,23 | 16951,31 |
| 5 | 9444,58 | 17012,31 | 4906,34 | 12973,31 | 7560,36 | 4040,88 | 22326,21 | 3915,85 | 15444,87 |
| 6 | 11301,24 | 15930,60 | 5916,44 | 7650,14 | 8908,05 | 3919,96 | 17606,75 | 4067,79 | 16047,55 |
| 7 | 9607,79 | 17591,83 | 1634,06 | 13573,53 | 8031,04 | 3846,01 | 12771,13 | -261,13 | 17061,47 |

Calculated NPV-s with tow years reinvestments in computer hardware are shown on table 2.

Table 2. Derived NPV-s from the random economies presented in table 1, in euro

| | EX=EX-prim | EX>EX-prim | EX<EX-prim | EX=EX-prim | EX=EX-prim | EX<EX-prim | EX>EX-prim | EX<EX-prim | EX>EX-prim |
|---|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| T | S=S-prim | S=S-prim | S=S-prim | S>S-prim | S<S-prim | S<S-prim | S>S-prim | S>S-prim | S<S-prim |
| 2 | -4552,16 | 21770,67 | -617,02 | -3736,13 | 5943,47 | -1893,71 | 8325,55 | -10,90 | 16084,55 |
| 3 | 16555,65 | 33273,18 | -5877,29 | 22468,10 | 7564,38 | -1866,28 | 6694,24 | -19962,17 | 27330,09 |
| 4 | 12938,21 | 39688,49 | -6161,68 | 2094,48 | 14325,23 | -1004,08 | 14819,00 | -15967,11 | 37660,23 |
| 5 | 19745,33 | 49181,15 | 2093,14 | 33470,86 | 12416,37 | -1273,17 | 69850,39 | -1759,49 | 43084,36 |
| 6 | 32285,61 | 53052,56 | 8129,82 | 15907,07 | 21549,98 | -826,21 | 60571,59 | -163,07 | 53577,16 |
| 7 | 30178,45 | 70361,78 | -9952,95 | 50137,87 | 22242,75 | 1179,72 | 46099,40 | -19491,35 | 67692,48 |

From NPV-s in table 2 are determined the standard variables for Normal Distribution of the process. They calculate probabilities for NPV_t to vary from the average loss to 0, from 0 to average NPV_t and the probability NPV to be above $E[NPV_t]$.

The final results, after substitution of the exact values in (1) are shown in table 3

Table 3. Final results for NB in euros

| T | $P\{NPV < 0\}$ | $P\{NPV > E[NPV]\}$ | $E[NPV]$ | $E[NPV < 0]$ | NB |
|------|----------------|---------------------|----------|--------------|----------|
| 2,00 | 0,40 | 0,20 | 4590,48 | -2161,98 | 4641,00 |
| 3,00 | 0,28 | 0,22 | 9575,55 | -6646,06 | 9829,72 |
| 4,00 | 0,33 | 0,23 | 10932,53 | -4526,24 | 11969,75 |
| 5,00 | 0,47 | 0,35 | 25200,99 | -3497,66 | 32483,29 |
| 6,00 | 0,49 | 0,39 | 27120,50 | -2887,17 | 36166,62 |
| 7,00 | 0,32 | 0,32 | 28716,46 | -7980,03 | 35461,07 |

Table 3 shows that the most efficient investment period is 6 years. It would be chosen 7 years period, but the results give the opportunity to reduce the period with one year and to reinvests in new technologies or SMDM before repayment period.

CONCLUSION

The most efficient alternative for investing in a SMDM, like presented in the paper is 2 years of depreciation of computer components and 6 years of investment period. The loan repayment period could be 6 or 7 years. In the sixth year is good moment for reinvesting in new meteorological devices. Presented in this article approach for preliminary investment assessment is useful for all contractors who want to plan their loans, when they invest in totally new system for IPM.

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INTEREST CONNECTION IN THE CROATIAN WOOD PROCESSING AND FURNITURE PRODUCTION

Renata Ojurović, Vanja Gašparić

SUMMARY

Wood processing and furniture production of the Republic of Croatia are the branches of industry which are characterized by the high number of smaller and middle-sized economic operators, which compete with each other; but, many of them are too small for the quality and continuous satisfaction of buyers' requests, and with that for the survival on the global market and rapid adjustment to the conditions of globalization. The response to the requests and intensive changes of global market is the interest connection, based on the principles of complementarity and synergy, by which the success in the certain segment of activity is achieved, as well as the outstanding competitiveness and promotion in the country and abroad. The most outspread mode of the connection is cluster, which becomes actual in the given branches. For the success of the cluster, the role of businessman is essential (not questionable), as well as the role of the state and the correspondent partner institutions. The Government of the Republic of Croatia, which had recognized the clusters as the vital part of the competitive economic policy that influences the reduction of the regional developmental imbalance, as well, promotes the development of the same through, for example, the drafting of strategic documents and subsidies.

Subsequently, the given paper gives the general overview of the interest connection and its meaning for sustainable development and competitiveness in the context of globalization; current forms in the wood processing and furniture production in the Republic of Croatia and the overview of the state activities, which promote mutual economic cooperation.

Key words: wood processing, furniture production, globalization, interest connection, cluster

1. INTRODUCTION

Already with the beginning of the 20th century, globalization is becoming one of the most important phenomena. Also, businessmen have to take into consideration global processes, because the new principles of action occur, which means that the new economy is affirming, forming the new economic sciences. At the same time, the competitive position in the global business surrounding should be more guarded, acquired and strengthened, and value chain should be constantly reviewed and upgraded. This process is achieved with the acceptance of the innovative forms of cooperation. Likewise, the current economic crisis encourages the acceptance of new economic models.

Maybe because of the still insufficient knowledge of the interest connection trend, dilemmas in the use of certain respective terms are present and the same are explained with further content. Forms of strategic connection are cooperation of businesses, cartel, business group, transaction alliance, merging, keiretsu and strategic alliance – coalition of businesses, created for the purposes of achieving the important business objectives.

The strategic alliance is one of the growing global economic trends. It differs from other types of cooperative agreements, because it arises in the function of achieving long-term objectives and plans and is directed to the improvement of competitive position on domestic and international market. Today, more than one fifth of the total income of global enterprises is created in the partner enterprises, and

forecasts tell us how in 2010 even 40% of total world's business activity will be performed in one of the form of strategic alliance. Strategic alliances are the responses of entrepreneurs to the intensive changes in economic activity, technology and globalization.

Cluster is the form of the strategic alliance, a group of related enterprises or associations of producers from one branch (also including raw material producers, as well as government and non-government organizations, scientific and educational institutions) which, associated in such a manner, solve their mutual problems and, by improving business activity, achieve a success in the certain segment of activity and the above average competitiveness and promotion in country and abroad.

Classification of the cluster into the form of the economic interest grouping is not rare, which is wrong. The economic interest grouping (EIG) is the form of company (as well as limited liability company, joint stock company, partnership, limited partnership and branch-office). In the former processes of clusterization in the Republic of Croatia, experience had shown that the clusters are registered as EIGs, associations and cooperatives, but majority is registered as the limited liability company.

Moreover, it is necessary to point out the existence of cluster initiative, which is a term, different from the cluster. The cluster is regarded to be the vertical and horizontal connection of the economic partners of certain industrial sectors on certain geographic area, with the objective to achieve international competitiveness, and the cluster initiatives are the organized regional sectoral networks between economic partners, with a view to improve innovativeness and international competitiveness. In other words, the cluster initiatives are a tool in the creation of innovation policies, while at the same time they help regions to manage their own economical development and stimulate communities to direct their efforts toward the existing industrial branches.

2. CLUSTER CONNECTION

Various authors define clusters differently (from Porter to Horvat and Kovačić), with regard to the course of their incurrence, their type, size and development stage. In the sequence of the different interpretations and definitions of the clusters it is hard to select that which is universal, because economic groupings in particular countries differ significantly. On the grounds of the most interesting market for us, the European market, the definition of cluster will be in this framework.

First recognition of cluster on the European continent comes in 2006 from the European Competitiveness Council, which recognizes clusterization as one of the nine priorities in the strengthening of the European innovative entrepreneurship. The clear concept of the cluster development was adopted by the European Commission in 2008, with the working document "The Concept of Clusters and Cluster Policy and their Role for Competitiveness and Innovation. Main Statistical Results and Lessons Learned". With the same document, for the first time the definition of the cluster is adopted as *"the group of enterprises, regionally connected economic operators and institutions which dispose with correspondent competences (professionalism, service level, resources, suppliers, skills)"*.

Expectations and potential benefits from the clusters and cluster initiatives for enterprises and regions are the additional stimulus for governments and other public stakeholders to include themselves into the promotion of cluster policies. The types and contents of the cluster policies significantly differ from country to country and usually we can speak of three distinctive types: (1) Strengthening of cluster relations on three levels: between members; with the strengthening of relations with research institutions; and with the strengthening of relations with state agencies; (2) Focus on research and development, through cooperation of members and cooperation with research organizations; (3) Promotion of cooperation between members, regardless if the same is with the institutions for research and development or is conducted on a horizontal level between the competitive enterprises and vertically, between enterprises which cooperate on the principle of the value chain enlargement.

We distinguish two models of cluster construction (1) "Top down", from top towards bottom – initiative comes from the government, which, after cluster formation, can withdraw and assume its initial role, i.e. the role of the insurer of favorable conditions and the role of a moderator; (2) "Bottom up", from bottom up to top – initiative comes from entrepreneurs, and the government is a moderator which should enable the conditions for the cluster development.

What entrepreneur achieves with the clusterization, and what achieves the state?

The entrepreneur, small and middle, achieves the easier approach to the specialized suppliers, lower costs of the new product and service development, exchange of technical-technological knowledges and informations, joint appearance on markets and, connecting with the agencies that provide expert services, it reduces its own costs. On the other hand, the objective of every state is the encouragement of economic growth and development and, subsequently, of the life standard of citizens and the only way to achieve that is to increase the productivity and competitiveness of citizens. The cluster, which contributes to the achievement of entrepreneurship objectives, is a good instrument for all the afore-mentioned, because it allows the higher level of product finalization and creates the basis for the entry of foreign investors. Besides, the clusterization is one of the most significant levers in the solution of the current economic crises.

The Republic of Croatia is the signatory to the Agreement on Joint Strategy and Objectives of Future Innovative and Cluster Policy of Central and East Europe. The Strategy points out innovations, as the significant factor of the European industry competitiveness, while the clusters are one of the key ways to encourage innovativeness. But, in relation to global trends, Croatian enterprises are slower in joining the trends of interest connection. Still, lately, in the Republic of Croatia, the institution of clusters as the mode of connection is in increase.

3. CONNECTION IN WOOD PROCESSING AND FURNITURE PRODUCTION

3.1. International Experiences

In the developed European countries, the system of clusters is intensifying increasingly, giving recognizable contribution to the development and increasing of the export of the wood processing and furniture production. For example, the Finnish wood cluster, which employs about 200 000 men, participate in total export with even 40%. When Finland, thirty years ago, decided for the export strategy through the clusters, it was not a specially developed country, but, it had a vision and consensus that knowledge is the value of society. By all means, one should also mention examples from other European countries, e.g., Ireland, Denmark and Estonia, while in the global context we can mention New Zealand, Canadian, Australian, Indonesian and other clusters.

In the majority of countries where the wood processing and furniture production is developed, the respective strategic alliances are based on the connection of the manufacturing companies of the broad spectrum of industries (forestry, textile industry, logistics...), institutional intermediary structures and scientific-research communities which, in relation to various functions and activities which they perform, represent the important bonds of production chain. All that was mentioned before had led to the progress of countries in the level of innovations and design, enhanced education and the implementation of the modern marketing solutions for the appearance on markets. Interest connection, activity in industrial districts, use of the technology park services or the certain mutual connection of the afore-mentioned, are the features of the modern world's wood processing and furniture production. Such a picture is the consequence of the systematic care for sectoral circumstances and, in accordance with this, the enhanced level of the government support to economy is emerging. One of the regular models for the transmission of state aids for the economy in the European Union is exactly the model of clusterization. It can be said that the Croatian wood processing and furniture production should strive towards that, because of its economic justification through geostrategic position, domestic raw material

potential, tradition and experience, the inclusion and development of local suppliers and subcontractors, as well as because of the existence of technical infrastructure.

3.2. Croatian Experience

Globalization and the current economic situation had imposed the new rules of behavior in the world's industry and trade. Successful resistance to the increasing competition and development of the competitive abilities of the Croatian wood processing and furniture production companies conditions the deliberation of the new developmental concept.

Undoubtedly, the results of the given branches until now (foreign trade exchange records the continuous positive trend from 2004; also, there is the increasing in the furniture export, total income, employment and in the number of economic operators; \$ 977 million was achieved by export in 2008, which represents, in relation to 2007, the increasing of 5%) are mostly the consequence of their competitive advantages which, after all, are not enough for survival and sustainable development, which means that it is necessary to accept the concept of strategic models. Also, the same is required by the fact about the large number of the primary wood processing companies and the domination of primary capacities at final producers, because with the certain change of structure and organization – cluster formation – prerequisites for the activity of profitable companies can be created. Moreover, the connection level of the companies with the scientific-research community is exceptionally low, and consequently industries do not develop new products, strong enough for the placement on international markets.

The initial phase in the cluster development in the Republic of Croatia started in 2003, with the allocation of funds for the drafting of the study of possibilities of development of the same in certain industries by the contemporary Ministry of Trades, Small and Medium-Sized Enterprises. The clusters were established in the same year, the cooperative "Slavonski hrast" - the first strategic alliance in the Croatian wood processing and furniture production, which is active till today and the cluster, under the name of Drvni klaster zapadne Hrvatske – which stayed at the stage of establishment, and was supposed to connect the producers of Lika and Gorski Kotar. In 2004, the first state initiative is recorded, i.e., the adoption of the Strategy of Development of Industrial Wood and Paper Processing, which was carried by the former Ministry of Agriculture, Forestry and Water Management. Also, academic and research circles had started with the research of the strategic connection model (University of Zagreb, Faculty of Forestry).

Present picture points to the following problems in the establishment of domestic clusters: somewhat difficult approach to the capital for capital investments; slow implementation of new technologies and materials in the small and middle-sized entrepreneurship; slow development of the business and product quality and the lack of experts and qualified staff, educated in market sciences. The export potential of the Croatian wood processing and furniture production is not yet exploited, and that, principally, with the meaning of the progress in the implementation of the new product innovation and development, technical improvement of products and production plants, education, application of design and new marketing solutions, creation of export strategies and other activities, related to the branch export enlargement, all of which conditions the establishment of the new and strengthening of the existing forms of interest connection as the export tool.

4. WOOD PROCESSING AND FURNITURE PRODUCTION CLUSTER

Corresponding Ministry of Regional Development, Forestry and Water Management, with a help from the director of cluster and cluster initiative, had set up a base for the same in the wood processing and furniture production, which is the foundation of the presented picture of analysis, attached to the chapter's content. The Foundation Formation Date is within the first five months of the on-going year, so

that it does not include eventual new registered forms. The given mode of data collection is conditioned with the nonexistence of the official cluster registry, nor the same have an obligation to register an institution in some government body or to publish it in the official government journal, Official Gazette.

Today, in the Republic of Croatia, looking at the overall industry, there are 46 forms of interest connection (Source: Ministry of Economy, Labor and Entrepreneurship, MINGORP, 2009). The representation of wood processing and furniture production in the same is 17%, or 7 clusters (Slavonski hrast, Drvni klaster sjeverozapadne Hrvatske, Hotel plus, Tehnointerijeri, In Parket, Gorski kotar and Drvni klaster) and one cluster initiative (Hrvatski interijeri)), founded in time sequence, presented with Table 1.

Table 1. Year of Foundation of Clusters and Cluster Initiatives

| Year of Foundation | Number of Clusters and Cluster Initiatives |
|--------------------|--------------------------------------------|
| 2003. | 1 |
| 2004. | - |
| 2005. | 1 |
| 2006. | 1 |
| 2007. | 2 |
| 2008. | 1 |
| 2009. | 2 |

Existing clusters and initiative, founded in 2009, are organized in the form of association (2), cooperative (3) and limited liability company (3). Observing the same per the number of members, they all have up to 25 members, and numerically the biggest cluster is constituted from 24 enterprises. The characteristic of them all is the nonexistence of enterprise, which can be marked as leading enterprise (per incomes, employment number and activities within the cluster). The total number of employed per cluster is getting around from the lowest 250 up to the highest number of 2 600, and the mere number of employed persons is not connected with the number of members, so that the cluster with the highest number of members employs below the average number of employees (median), while, for example, the cluster with 10 members employs 2 600 men in total. County Chamber of Commerce, associate-degree colleges, local self-government authorities and development agencies are present as associated members.

The approach to the foundation of all the clusters is *bottom-up*, with the help of, for example, local development agency, entrepreneurial centre or County Chamber of Commerce, while the cluster initiative is founded with the *top-down* approach, initiated by the Employer's Association. Initial means for the foundation of two clusters were exclusively the private means of members, while the rest were established with the help of the state budget means. Further financing (with membership fees, subsidies of central government and, in smaller part, through commercial project) is, for all of them, related to the state support means, where the biggest share has the corresponding Ministry and the Ministry of Economy, Labor and Entrepreneurship.

The image of activity representation in the cluster shows the predomination of processing, with the majority of share in the wood processing industry, and with the presence of textile industry and trade. From the total number, four clusters encompass exclusively the economic operators of the given branches. Predominant objective of the cluster foundation is a joint appearance on domestic and international market, after which follows objectives as the joint investment in research and education of employees, and the reduction of supply expenses, while, in smaller part, the objective of obtaining state incentives in the form of non-refundable funds is present, as well. The exchange of knowledges and experiences, joint appearance on market and promotion, as well as the construction of shared logo and visual identity are outshined as the most common forms of joint activities. Joint supply and distribution, and the establishment of branch offices in the country and/or abroad are not present.

Looking at a manufacturing process, five clusters are specialized, two for the hotel objects equipping; one for floor coverings, one for the traditional wooden houses from the area of Lika and Gorski Kotar, and for the one cluster, which is newly established, a long-term objective is the creation of pellets market, while the two newly established clusters and the cluster initiative had not started with the production on a partnership basis. The representation of the new joint product is not on a satisfying level – only two clusters. Selling market is Croatian and international because of the already existing market of members, while a market for new products is only Croatian. More than a half of clusters (4) and cluster initiative are managed by the permanently employed manager, the other two are the representatives of members, and one cluster is managed by the representative of the local entrepreneurial centre.

Regarding achieved cooperation or membership with certain institutions, there is the presence of connection with, for example, associate-degree college or economic institute. In Kranjska Gora, in 2008, the Network of the South-East and Central Europe Wood and Forestry Clusters was established. The representatives of Wood Agency – Cluster of the Serbian Wood Processors, Wood Cluster of Bosnia and Herzegovina, Cluster of the Wood Industry of the Republic of Macedonia, North-Western Croatia Wood Cluster, Styrian Wood Cluster (Holzcluster Steiermark), Slovenian (Lesarski grozd Slovenia) and the Association of Wood Processors „Drvo – PD Prijedor“, had adjoined the given Network, while the associated member is the Italian Institute for Foreign Trade. The Network objective is the enhancement of competitiveness and utilization of the wood processing and furniture production potential, and one of the activities will be shared projects, which will open possibilities for the use of the means from EU funds.

Generally, with exceptions, it can be said that the clusters and cluster initiative do not follow the European trend of stimulating innovations and innovation processes, and have the common problem of self-support. They are also characterized with the insufficient research of the new examples of existing technologies; unusability of available potentials in the creation of added value; insufficient level of cooperation with environment; unsatisfactory development of the new shared products; not attracting foreign investors as well as other flaws, characteristic for both corresponding branches in total.

5. CLUSTER SUPPORT PROGRAM OF THE STATE OF CROATIA

Generally, the initial phase of institutional support for the process of stimulation and developing the interest connection system in the Republic of Croatia started in 2003 when, as it is already said, the former Ministry of Trades, Small and Medium-Sized Enterprises had invited the tender for the allocation of funds for the drafting of the study for the possibility of developing clusters in certain industries. Users of the incentives were the economic interest associations and other registered economic forms and the institutions of entrepreneurial and technological centres, universities and similar institutions. Co-financed were the projects in the wood processing and furniture production field, for example, Project for Cluster Development in Wood Processing, Furniture Production and Paper Processing in the Republic of Croatia and the Project for Developing the Cluster of Producers of Slavonian Oak Products, which carrier is the University in Zagreb, Faculty of Forestry.

At the beginning of 2004, the Ministry of Economic, Labour and Entrepreneurship, within the Operative Program of Stimulating Small and Middle-Sized Entrepreneurship, had placed the project under the name Shared Product (clusters) into the priority projects with the more significant amounts of support in relation to other projects. Furthermore, according to the Program of Incentives for Small and Middle-Sized Entrepreneurship, with the implementation of the Shared Program project, the mutual connection of small and middle-sized economic operators is stimulating, as well as the connection of them with the big economic operators, towards higher level of product finalization, process rationalization and competitiveness enhancement. In 2005, the program of stimulating interest connection is continuing, with the new phase of support, i.e. for the clusters in formation and operative

clusters. With financial support, we also started with the education of cluster managers on the principle *training of the job* in the cooperation with German and Austrian cluster managers. Allocation of funds, based on the Program, is continuing until today, but there are other sources of support, as well, as are the subventions of regional and local institutions for the stimulation of economy and the subsidies within the EU projects framework.

In 2008, the Ministry of Economy, Labour and Entrepreneurship, through the Strategy of Croatian Export Offensive (Hrvatska izvozna ofenziva, HIO), had started with the cluster foundation in the strategic export industries, including the wood processing and furniture production, under the *top-down* principle. One of the HIO objectives is the establishment of the “Drvo-Namještaj” export cluster, and the corresponding activities were initiated with the cooperation of Croatian Chamber of Commerce and the corresponding Ministry. The producers of parquet and floor coverings showed the biggest interest for the inclusion into the export cluster, with the main objective of strengthening export competitiveness through the organization of the stronger appearance of the Croatian producers of parquet and floor coverings, but other products, as well, on foreign markets, with a focus on the fast-growing markets of the Middle and Far East and Russian Federation. Currently, the most significant program of the cluster and cluster initiative subsidy, drafted by the same Ministry, is under the title “Klasteri – udruživanjem do uspjeha” (Clusters – success through association”, and the Strategy of the Croatian Economy Clusterization is also in drafting, with the corresponding action plan. Also, the corresponding Ministry, based on the Operative Program of Development of Wood Processing Industry in the Republic of Croatia 2006-2010, grants non-refundable means third year already for the purposes of stimulating the business and activities of clusters and cluster initiatives in the wood processing and furniture production.

The existence of the institutional financial supports to the sustainability of interest association in the wood processing and furniture production is obvious, but the implementation of the financial support system with the more significant inclusion of scientific community and other corresponding institutions would allow the achievement of the necessary competitiveness level of the same on domestic and foreign market. On the other hand, unless the participants – enterprises in such subcontractor relationship, do not contribute to the improvement of business dealings and the resolution of mutual problems by themselves, no institutional model of support will help the sustainability of innovative entrepreneurship.

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INCREASING OF COMPETITIVENESS IN FURNITURE MANUFACTURING BY THE VALUE ANALYSIS PRINCIPLES

Marek Potkány

ABSTRACT

This paper deals about the problematic of target costing implementation into the managerial decisions. These decisions make value analysis principles for increasing in competitiveness by the setting off limits for maximum allowable costs which should not exceeded by company manufacturing. By this approach is possible to improve product quality, service, shortening the research and development period and continual effort to lower costs.

Key words: cost, target costing, value analysis, price,

1. VALUE ALYSIS PRINCIPLES

Value analysis is a very important tool that can increase the competitiveness of outputs in each branch of industry. Value analysis represents a systematic approach to evaluation of product characteristics that enables to fix alternatives that can improve the product quality, defined as the proportion of its commercial characteristics and costs. The value analysis principles is useful also for chain of custody certification in wood processing industry (Paluš, Kaputa, 2007)

Value analysis looking at all parts of the product the cheapest solutions by identifying improvements that lower the costs and do not limit functionality or eliminate unnecessary functions that increase costs. From the point of view of value analysis as the most important are considered those pieces of information which closely define the relationship between the customers' requirements on product quality and its individual parameters (**quantity-function deployment, QFD**) and the information where it is necessary to deal with finding the disharmony between the customer expectations and real costs (**functional costs analysis, FCA**) (Tumpach, 2008). These are the approaches used by the target costing calculation. The use of these tools is in this paper represented by a practical case study of research, development and preparation of manufacturing PC desk Classic.

2. TARGET COSTING

Target costing calculation also referred to as target oriented method of costing calculation has its origins in Japan. In 1980's it spread to our continent through American daughter companies in Western European countries. In 1990's more than 80% of engineering and electro technical industry companies in Japan used this method of calculation (Tumpach, 2008). This one from the calculation method that is defines in theory of Calculation and budgeting (Škoda, 2004).

The primary task is not to find out how much a product costs, but how much a product can cost so that it is possible to be sold for a particular market price. Calculation as a pricing tool is in the areas of strong competition therefore slowly losing its significance. Price is determined by the market and it is not possible to offer the product at the market for a higher price. Thus companies have to manufacture products with such costs which can be covered by the final price. Therefore it is important to plan costs not only in the manufacturing stage but at the initial stages of the production performance. Production costs are influenced especially by its characteristics and manufacturing methods. The difference between the traditional approach of the calculation and the target costing is present on the figure 1.

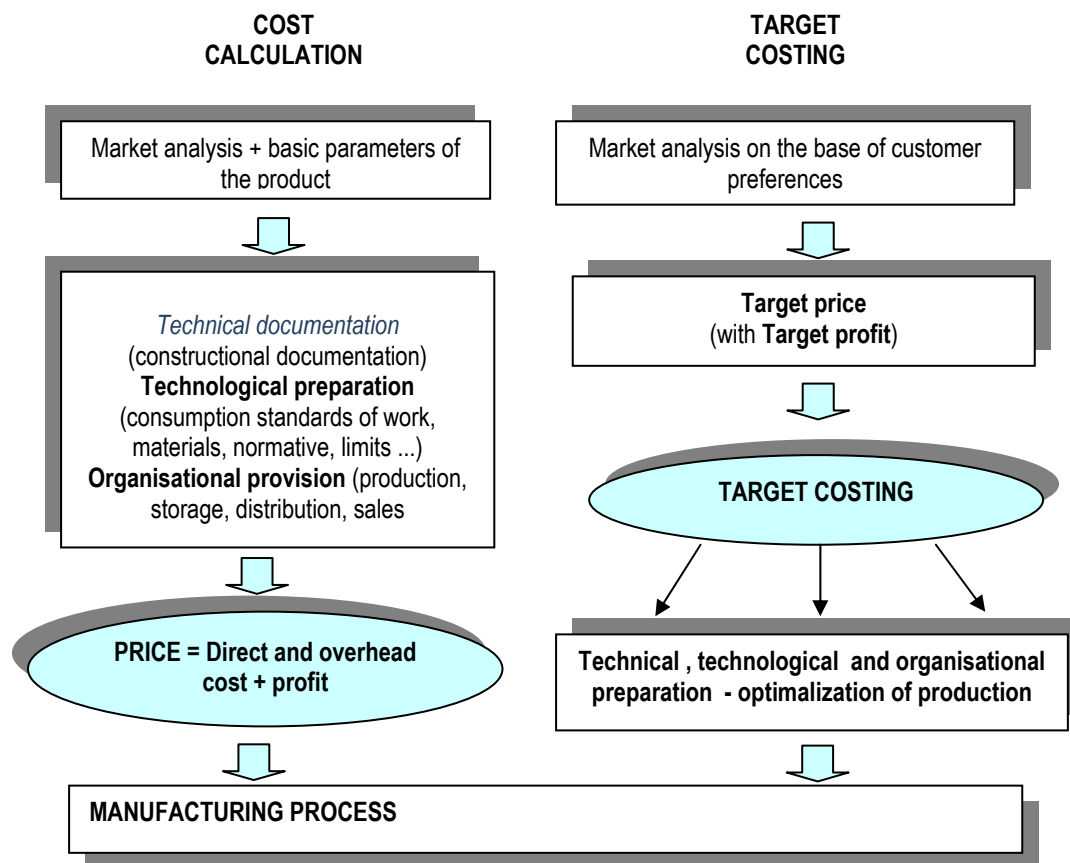


Figure 1. Difference between the traditional approach of the calculation and the target costing

Majority of performance costs are decided already in pre-manufacturing stages since there are already determined such factors as technological progress and performance characteristics. It is proved that 85 to 90% of costs relating to performance are the result of decision made in pre-manufacturing stages (Foltínová a kol. 2007).

The basic idea of target costing calculation is in setting the limits for maximum allowable costs which should not exceeded by company manufacturing. This limit is untraditionally set on the basis of technical and economic standards of tangible consumption but as the rest which remains from the product price minus the target required profit (Foltínová a kol., 2007). Allowable costs are set by subtracting the target profit from the target price Macík, 1999. Allowable costs are compared with standard drifting costs and the final difference shows the necessary cut of costs already at the product development stage.

$$\text{Allowable costs} = \text{target price} - \text{target profit}$$

The base for using this method is the existence of relatively stable or beforehand expected market price (target price). This price must reflect especially the value perceived by customers, characteristics, quality and competitive or substitute performance price. The price should be verified by marketing research which should focus on target group of customers' preferences (Šatanová, 2004).

Besides the target price it is necessary to determine also the target profit that is usually determined in the absolute value or with the use of return on sales index (ROS) or return on costs (ROC):

$$ROS = \frac{\text{Profit}}{\text{Sales}} \quad (1)$$

$$ROC = \frac{\text{Profit}}{\text{Costs}} \quad (2)$$

According to the stated level of return on sales it is then possible to determine the level of the target profit:

$$\text{Target profit} = (\text{market price} \times \frac{ROS}{100}) \quad (3)$$

$$\text{Target profit} = (\text{target price} \times \text{index ROC}) / (1 + \text{index ROC}) \quad (4)$$

It is then possible to determine the required level of target profit and the acceptable level of allowable costs

$$\text{target profit} = \text{target price} \times \text{output profitability} \quad (5)$$

$$\text{allowable costs} = \text{target price} - \text{target profit} \quad (6)$$

The problem arises if the target costs are lower than real costs which are necessary to manufacture of a particular product. Company can then solve the particular situation as follows:

- gives up the idea of a new product launch,
- gives up the idea to achieve the minimum profit level,
- tries to lower the real manufacture costs,
- attempts for product functional differentiation so that the customers are willing to pay more than just a standard product market.

Especially the last three options are alternatives, which can significantly help to advance each business and entrepreneurial activity and its use individually or in combination lead to significant success of many foreign companies. However they require approach based on value analysis principles, where there it is, in case of target cost calculation, possible to apply quantitative functional analysis and the methodology of functional costs analysis.

2.1 QUANTITATIVE FUNCTIONAL ANALYSIS

In real life it often happens that high production costs are not the result of the fact what the real customers' needs are but more what is supposed their needs will be. At target costing calculation it is therefore by means of marketing research necessary to find out the customers' requirements on performance and put them into balance with performance parameters. Quantitative-function deployment (QFD) deals primarily with this analysis.

2.2 FUNCTIONAL COST ANALYSIS

On the other hand the functional cost analysis focuses on finding out any inconsistency between customers' preferences and real costs. There is though a problem with stating customers' qualified point of view on some of the performance parameters since customers can express their requirements regarding the performance look and its basic functions but not its individual parts. Therefore the functional cost analysis gets the data from QFD. It is important to realise that setting the basic customer preference is for customers the most important cause of their interest in performance and in case it is absent performance starts to be for customers uninteresting and for the company

unsalable. According to this fact the functional cost analysis sets the inconsistency between customers' preferences and real costs at minor - supplementary functions.

3. CASE STUDY

In order to develop new PC desk Classic (figure 2) we did the marketing analysis, which revealed that from the point of view of potential customers the most important are the following functions listed also with the percentage:

- enough storage space 35%,
- modular principle 22%,
- possibility of ergonomic adjustment 5%
- spacious working space 30%,
- sliding bar keyboard 8%,



Figure 2. PC desk Classic

The price survey pointed out that an ideal initial market price would be 120 €. For the company is adequate return of cost on the level 10%. After quantitative functional analysis of customers' requirements on function and its individual components were found the following facts (table 1).

Table 1. Qualitative-functional analysis of PC desk Classic

| Functions | Components | | | | |
|---------------------------|------------|-----------|------------------|----------------------------------|-----------------|
| | Corpus | Work tops | Doors and drawer | Connecting materials and forging | Mounts and legs |
| Storage space (35%) | 35 % | 10 % | 45 % | 10 % | - |
| Working Space (30%) | 10 % | 90 % | - | - | - |
| Modular principle (22%) | 30 % | - | 25 % | 40 % | 5% |
| Sliding bar keyboard (8%) | 20 % | - | 30 % | 50 % | - |
| Ergonomic adjustment (5%) | 5 % | - | - | - | 95 % |

Task: It is necessary to set the level of target profit and overall allowable cost, allowable costs of individual components and by the functional costs analysis determine the inconsistency between customers' preferences and planned costs necessary for this furniture production.

$$\text{Target profit} = (\text{target price} \times \text{index ROC}) / (1 + \text{index ROC}) = (120 \text{ €} \times \frac{10}{100}) / (1 + \frac{10}{100}) = 10,9 \text{ €}$$

$$\text{Allowable costs} = \text{target price} - \text{target profit} = 120 \text{ €} - 10,9 \text{ €} = 109,1 \text{ €}$$

Since we have no data concerning the level costs on individual PC desk furniture components we will set its level according to customers' preferences.

Solution: At first it is necessary to set importance of individual components as the collation of importance scale of individual customers' preferences and percentage of assurance level of a particular preference by individual components (Table 2).

Table 2. Setting the level of individual components importance

| Functions | Components | | | | |
|---------------------------|------------|-----------|------------------|----------------------------------|-----------------|
| | Corpus | Work tops | Doors and drawer | Connecting materials and forging | Mounts and legs |
| Storage space (35%) | 12,25 % | 3,50 % | 15,75 % | 3,50 % | - |
| Working Space (30%) | 3,00 % | 27,0 % | - | - | - |
| Modular principle (22%) | 6,60 % | - | 5,50 % | 8,80 % | 1,10 % |
| Sliding bar keyboard (8%) | 1,60 % | - | 2,40 % | 4,00 % | - |
| Ergonomic adjustment (5%) | 0,25 % | - | - | - | 4,75 % |
| Total | 23,70% | 30,50 % | 23,65 % | 16,30 % | 5,85 % |

Allowable costs of individual components: (importance x allowable costs)

| | |
|----------------------------------|-----------------------------|
| Corpus | 0,2370 x 109,10 € = 25,86 € |
| Work tops | 0,3050 x 109,10 € = 33,28 € |
| Doors and drawer | 0,2365 x 109,10 € = 25,81 € |
| Connecting materials and forging | 0,1630 x 109,10 € = 17,79 € |
| Mounts and legs | 0,0582 x 109,10 € = 6,36 € |

Inconsistency between customers' preferences and planned costs necessary for PC desk Classic of furniture production can be determined by functional costs analysis (Table 3).

Table 3. Functional costs analysis

| Functions | Components | | | | | Total |
|------------------------|------------|-----------|------------------|----------------------------------|-----------------|----------|
| | Corpus | Work tops | Doors and drawer | Connecting materials and forging | Mounts and legs | |
| Storage space | 8,295 % | 3,050 % | 10,6425 % | 1,630 % | - | 23,62 % |
| Working Space | 2,370 % | 27,450 % | - | - | - | 29,82 % |
| Modular principle | 7,110 % | - | 5,9125 % | 6,520 % | 0,2925% | 19,83 % |
| Sliding space keyboard | 4,740 % | - | 7,095 % | 8,150 % | - | 19,99 % |
| Ergonomic adjustment | 1,185 % | - | - | - | 5,5575 % | 6,74 % |
| Total | 23,70% | 30,50 % | 23,65 % | 16,30 % | 5,85 % | 100,00 % |

On the basis of functional costs analysis it is possible to state that when buying PC desks 35% of customers are interested in function of storage space and approximately another 52% of customers

consider as the most important spacious of working space and modular principle of construction this product. We can also state, that in this case this reflects the basic PC desk furniture functions and they count for 73,3% of total level of the costs. Without this function is basically non-functional product for customers.

The biggest disproportion rises between the customer's preference and the level of functional costs for the function of sliding space for keyboard of PC desk furniture (figure 3). While customers' preferences are at the level of 8 %, the costs for this function reach 20 % from the total costs (it is 21,80 €). Removing this function can probably lower the sales volume but on the other hand there can be reached a reduction of total cost of 19,99% which can be used to lower the selling price or improve other important functions (storage and working space or modular principle). The similar situation is also at the function of ergonomic adjustment, where is spending about 1,7% (1,90 €) cost more than is the customer preference.

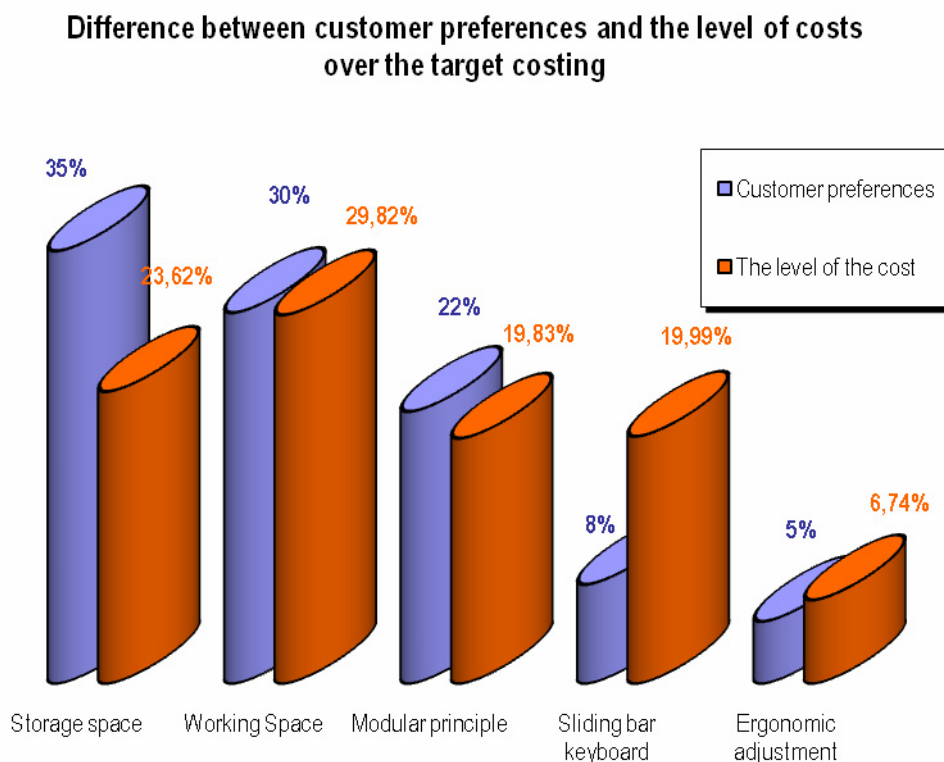


Figure 3. Difference between customer preferences and the level of costs over the target costing

The result from the target costing should therefore reflect the improvement of those functions which are preferred by 87 % of customers and at the same time it allows to lower the price about 30 €. Of course we have to bear in mind a condition that expected positive effects will outnumber the drop-out of sales of 13% of customers who prefer the function which should be eliminated.

The second result from the target costing approach is that at the stage of research and product is possible to establish criteria levels of the cost of individual components needed for production of PC desk that respect of market price and the acceptable level of target profit. This is very important information for decision-making task of the type Make or Buy. This is one from the trends of Contemporary Developmental Orientations in the Production on Furniture Branch. About this problematic describe Stasiak – Betlejewska R., Borkowski S. 2007.

CONCLUSION

Target costing as a modern method of calculation uses the principles of value analysis, by using instruments of functional cost analysis and quantitative-function deployment can provide a functional differentiation of the product. This approach can find limitations in the initial stage of research and product development, while 85 to 90% of the costs related to performance is the result of decisions made in the pre-production stages. The risk of this approach is mainly at application of precision marketing research and determining the level of allowable costs for each component of the products. By this means is possible to increase of competitiveness in furniture manufacturing and make a changes in European Wood Industry (Parobek, 2006). This approach has a high importance for quality assurance in pre-production phase and it's increasing (Gejdoš, 2005).

AFFILIATION

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RANKING OF CROATIAN WOOD INDUSTRY COMPANIES ACCORDING TO BUSINESS SUCCESS

Ksenija Šegotić, Maja Moro, Andreja Pirc, Renata Ojurović

ABSTRACT

Determination of success has become very important in various aspects of human activities. In order to stay and grow in today's highly competitive business environment, companies have to aspire to success. The parameters of success are manifold since doing business is a complex process. This paper presents a multicriteria model for the companies ranking. The model is based on the AHP method and it enables the integration of the quantitative data and qualitative data by which the parameters of success are described.

Key words: wood processing, successful business performance, multicriteria analyses

1. INTRODUCTION

Due to the extensive forest fund of the Republic of Croatia, there is a rich tradition of wood processing and furniture production. Wood processing and furniture production are two of the most important industrial branches of the Republic of Croatia, therefore, their growth, development and thus also their successful business performance are very important for Croatian economy as a whole.

Competitiveness among the participants of the wood industry sector, both of European and non-European companies and of the companies within the European Union, has been continuously increasing (Lähtinen, 2007). However, in the last two years, the Republic of Croatia has been stagnating on the world economic forum competitiveness scale and, in 2008, it took not more than the 61st place among 134 concerned countries (National Competitiveness Council, 2008) and that has negatively affected both the business performance of the Croatian companies and thus also of the Croatian companies of the wood processing and furniture production sector.

Prior research has shown that the size of a certain company impacts the successfulness of the company's export. By comparing small-size, middle-size and large-size companies, Eastin, Cunningham and Roos determined that a middle-size company achieves more success in the export of its products or services in relation to small and large-size companies. Majocchi, Bacchiocchi and Mayrhofer came to the same conclusion in their research in which they analysed the impact of company size on export performance in small and middle-size entrepreneurship. Factors such as company ownership and company age also affect export performance. Moreover, foreign-owned companies achieve better export performance in relation to domestic-owned companies (Coskun, 1996) which has also been confirmed by Rojec, Damijan and Majcen in their research. Prior research has shown that younger companies are more inclined to export in relation to older companies (Lee and Young, 1990).

Business performance of a company is also affected by the size of the company. Small-size companies are usually more successful in their business operation in relation to large-size companies and the company's business performance is also significantly affected by the education level of its employees and authorized persons (persons who represent the company towards third parties, individually and independently in all the operations at home and abroad). The higher the education level of the employees and the authorized person, the better the business performance of the company and the more successful it is (Pfeifer, 2001). In her research, the above author states that small-size and new companies achieve good business results on the economic market because they generate new products, processes, economic growth and flexibility.

The spreading of new technologies and the globalization transform the economies of the developed industrial countries into knowledge-based economies. An important part of the competitiveness of the national economy is the level of knowledge and expertise of the personnel (Bejaković, 2006). Companies managed by persons with higher education levels achieve more success in their business in relation to the companies managed by persons of lower education levels (Pfeifer, 2001).

The aim of the work is to analyse business performance of Croatian companies from the wood processing and furniture production sector and to determine which of the defined and analysed criteria and in which manner they affect business performance.

2. MATERIAL AND METHODS

In order to survive in today's extremely competitive and developed business environment, companies must strive for the achievement of business performance as great as possible. The work analysed companies which, according to the National Classification of Activities as of 2002 (The Official Gazette 52/2003), are classified under the DD 20 group- wood processing and wood and cork products production and the DN 36 group- furniture production and other processing industry. According to their sizes, companies are divided, based on the Act on Promoting the Development of Small Enterprises (Official Gazette 29/2002) and the Act on the Amendments to the Act on Promoting the Development of Small Enterprises (OG 63/2007), into small-size, middle-size and large-size; criteria for size determination are total annual income and average annual employment. On the other hand, according to the type of ownership, they are divided into: Croatian ownership (company is 100% owned by Croatian entities), foreign (company is 100% owned by foreign entities) partially Croatian (51% of the company is Croatian and 49% is foreign) and partially foreign (51% is foreign and 49% is Croatian).

Classification of companies included in this analysis is shown in Table 1.

Table 1. Classification of companies according to categories

| | <i>Craft (Trade)</i> | <i>Limited liability company (Distribution company)</i> | | | <i>Join stock company (Company with share capital)</i> | | Σ |
|--------------|--------------------------|-------------------------------------------------------------|---------------|------------|------------------------------------------------------------|------------|-----------|
| | | <i>Small</i> | <i>Medium</i> | <i>Big</i> | <i>Medium</i> | <i>Big</i> | |
| DD 20 | 15 | 33 | 7 | 0 | 2 | 1 | 58 |
| DN 36 | 9 | 15 | 3 | 3 | 0 | 2 | 32 |
| Σ | 24 | 48 | 10 | 3 | 2 | 3 | 90 |

The four criteria for evaluation of success have been chosen: income per employee, percentage of export, percentage of university educated employees and company age, with unequal importance of the said criteria. The data on all four criteria were gathered from development projects of companies within the framework of first granting of non-repayable aid for improvement and enhancement of industrial wood processing in 2007 by the former Ministry of Agriculture, Forestry and Water Management.

By inspecting all 90 companies according to the four criteria of success, the most successful ones have been chosen, singularly for each criterion, and the first 10 companies have been ranked separately for sectors DD 20 and DN 36. The data are shown in tables 2 and 3.

Table 2. Data for successful assessment of companies' success for the sector DD-20

| Company | Income per employee (HRK) | Share of export in total income (%) | Share of university educated employees (%) | Company age (years) |
|---------|---------------------------|-------------------------------------|--------------------------------------------|---------------------|
| 2 | 234,268.46 | 98 | 12.5 | 12 |
| 3 | 188,500.84 | 97 | 5.3 | 22 |
| 4 | 322,932.64 | 95 | 0.8 | 17 |
| 5 | 903,950.86 | 95 | 15.0 | 12 |
| 6 | 352,439.09 | 95 | 7.0 | 17 |
| 8 | 646,593.13 | 90 | 0.0 | 4 |
| 9 | 256,284.00 | 90 | 14.3 | 6 |
| 10 | 317,805.74 | 86 | 3.3 | 2 |
| 11 | 398,796.17 | 85 | 0.0 | 12 |
| 13 | 541,741.99 | 79 | 4.3 | 14 |

Table 3. Data for successful assessment of success of companies for the sector DN-36

| Company | Income per employee (HRK) | Share of export in total income (%) | Share of university educated employees (%) | Company age (years) |
|---------|---------------------------|-------------------------------------|--------------------------------------------|---------------------|
| 16 | 160,554.06 | 72 | 4.0 | 94 |
| 18 | 202,405.10 | 69 | 4.3 | 14 |
| 19 | 139,066.10 | 61 | 3.0 | 16 |
| 22 | 9,839.00 | 60 | 20.0 | 1 |
| 27 | 416,565.65 | 50 | 5.6 | 14 |
| 31 | 125,637.81 | 40 | 0.4 | 12 |
| 36 | 27,736.16 | 32 | 2.4 | 11 |
| 39 | 205,275.00 | 23 | 33.3 | 13 |
| 40 | 119,949.16 | 22 | 2.0 | 12 |
| 43 | 606,950.83 | 15 | 33.3 | 12 |

Ranking companies pursuant to their overall success assessed according to the four unequally important criteria is the problem of the multicriteria analysis and contains all the steps of the multicriteria decision-making. (Winston, 1994) AHP method was used. (Saaty, 1980)

The Analytical Hierarchy Process (AHP) is a decision making tool for multi-criteria decision analysis. The AHP mathematical theory was developed by T. Saaty in the 1970s. The AHP is a method of breaking down a complex, unstructured situation into its component parts; arranging these parts, or variables, into hierarchic order; assigning numerical values to subjective judgements on the relative importance of each variable; and synthesising the judgements to determine which variables have the highest priority and should be acted upon to influence the outcome of a situation.

AHP model for determination of the company's success in wood sector has the following criteria on the first level: (1) income per employee; (2) percentage of export; (3) percentage of presence of university educated employees and (4) company age, and alternatives are companies that we want to rank (Figure 1)

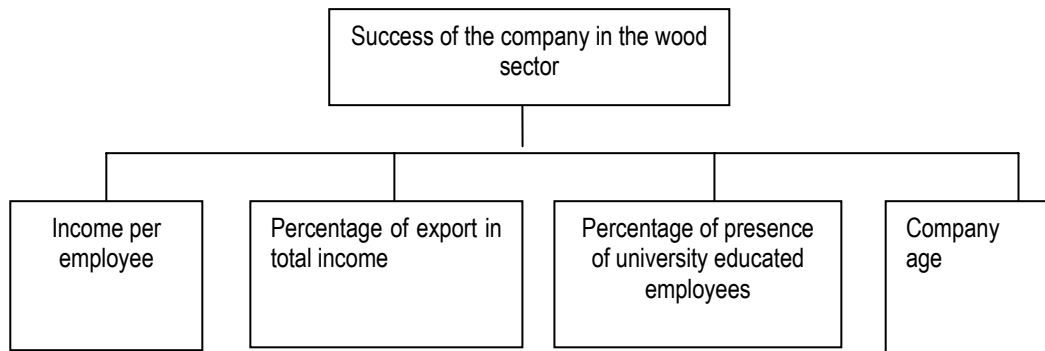


Figure 1. AHP hierarchy for evaluation of success of the companies in wood sector

3. RESULTS AND DISCUSSION

After the hierarchy was constructed, pairwise comparisons for the first level were made with the help of experts in wood technology using a 9-point scale. These evaluations resulted in matrix and by the eigenvector method we got the priorities of the criteria: income per employee 0.646, percentage of export in total income 0.204, percentage of presence of university educated employees 0.104, company age 0.045.

So, the most important is first criterion. The priorities of the criteria are the same in both cases, DD20 and DN36. Then we have data from the tables 2 and 3 and the final result can be seen in Figure 2 and Figure 3.

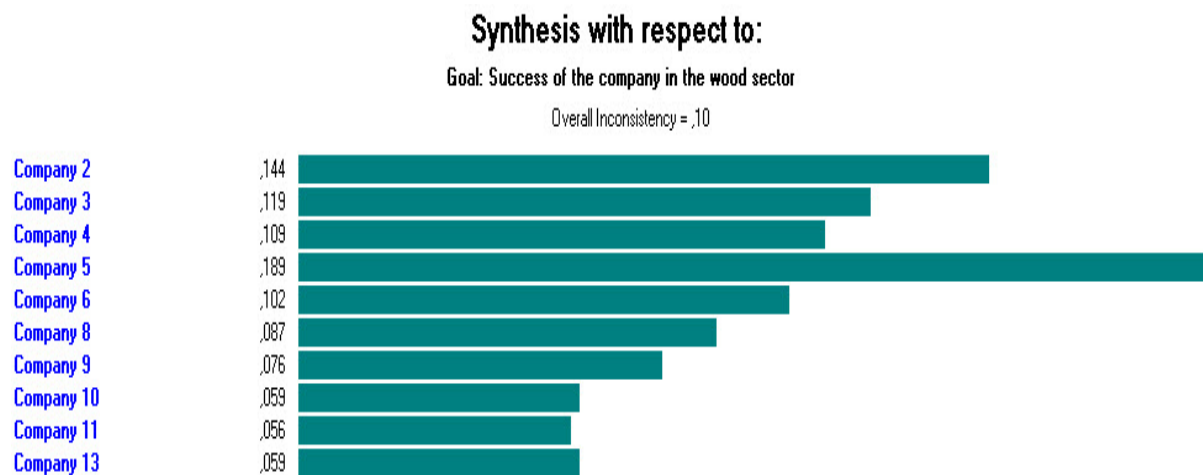


Figure 2. Priorities of the companies in wood sector DD20

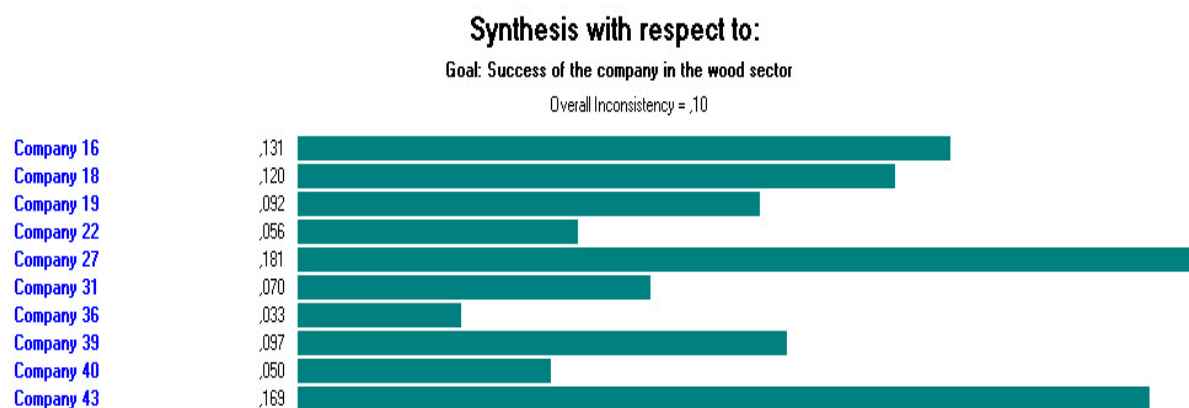


Figure 3. Priorities of the companies in wood sector DN36

According to the results reached by the AHP assessment in the DD20 sector, company 5 has taken the first place for success. This company belongs to the group of small businesses, it employs 20 people (out of which 15% university educated), the company exports 95% of its products and the company is 100% owned by Croatian entities. Then follows company 2, also Croatian ownership, which belongs to the group of craft businesses, employs 8 people, out of which 12,5% are university educated. It makes profit of 234.152,23 HRK per capita (per employee), and exports 98% of its products. The results are as expected i.e. small companies achieve better results.

In the sector DN 36, the most successful company is company 27, which belongs to the group of large businesses – joint stock company. The second most successful company is company 43, which belongs to the group of small businesses, employs 6 people, out of which 33,3% are university educated and its export rate is 15%. Next is company 16, also belonging to the group of big businesses, with 1257 employees (out of which 50 people or 4% are university educated). This company exports 72% of its products. In this case, the results of the assessment are not in concordance with prior researches because big companies also proved to be successful. All these companies are 100% owned by Croatian entities.

4. CONCLUSION

To determine which company is the best has always been very interesting, but has also been a very complex problem. The ranking lists are most frequently based on only one quantitative indicator. The aim of this work was to provide a possibility of a different approach to this problem, that is, to consider the problem of company ranking as the problem of multicriterial decision making. In this work we have used AHP method. It would be interesting to use some other method, maybe Data Envelopment Analysis. Also we can use more criteria.

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Chapter 3.

QUALITY AND ENVIRONMENT

THE SUPPLIER'S QUALITY EVALUATION WITH UTILIZATION OF BASIC SOFTWARE SUPPORT

Pavol Gejdoš

ABSTRACT

The supplier belongs between the most important parts of the enterprise. His main task is to deliver the products, which are needed by company for productions implementation. For the company itself is necessary such supplier, who is able to deliver all the products according to the exact determined demands. The process of supplier's evaluation and choice is usual to exploit just for this case. The increase of the product's quality is a significant effect, which should be recognizable in case of the good delivery quality providing. This fact should become for the company a motivation to realize how needed is to pay a sufficient attention to the process of the supplier's choice and evaluation.

Key words: quality, quality management, supplier, evaluation, software support

1. INTRODUCTION

The company where the main criterion is a success should be interested in a produce of products, which are the same as the claims of customers. To reach this ambition is need to know that every stage of creation of product is component of the last quality. In the case when is neglected attention for good quality it is possible that any other stages were needless. [1]

The biggest attention to reach quality should be devoted to pre-produce stage which is 80 % of quality of the product. The main role on the last value of the product is area of purchase of inputs. So that each company should be interested in what to do to reach permanent quality of inputs. The important step is good relations with suppliers. It is important to devote attention to value and choice of suppliers. [7]

2. EVALUATION AND THE CHOICE OF SUPPLIERS

One of the basic steps in establishing of the system of managing of quality is also the relation between supplier and customer. Between the suppliers and customers is always some relation it is need to reach between them bilateral balance and the good relations based on the confidence of business partners.

The processing of buying due to the norm of ISO 9000: 2000 is defined as:
The organisation have to secure that buying product corresponds to specific asks for purchase. The kind and extent of managing which is applicated on the supplier and buying product have to depend on influence of buying product on the other realisation of product or on the final product. [4]

Organisation has to value and choose the suppliers during their ability to supply product with a special asks of organisation. They have to define criterions of choice, evaluation and revaluation. The results of evaluation and any other activities have to be kept.

The choice of supplier is very interesting, in some cases dominant, and is component of each purchase in company. The decision is weighty and more difficult if the buying opportunity is bigger and if is here more suppliers. The decision about supplier is not simple. It is need to know other criterion which are the component of buying mix and other external and intradepartmental factors. [3]

The quality has very important influence on the results of managing of each company, also on the realisation of long-time strategic ambitions to develop the company. It is component of costs, stocks, quality and good selling of product and also of the profit. This decision is not as decision of separate buyer, but it is decision of wider team

The decision about supplier is process, which is difficult in gaining of information and after that is important communication with suppliers. If it is sure which supplier is wanted it is not possible to stop with searching of other new opportunity of buying, also in valuating and choice new supplier, which offers better conditions. [5]

3. THE MANNER OF CHOOSING AND EVALUATION OF SUPPLIERS

The first step in this case is to choose suitable criterion for evaluation. After that and after assemble all documents about supplier is need to evaluate perspective suppliers. We have to give them some points. The minimum is 0 and maximum is 10 for every criterion. Here is the sample of evaluation and points for supplier:

1. Criterion : The price of product (0-10 points)

| | |
|----------------------|-----------------------------------------------------------------------------------------------------------------|
| 0 points | supplier supplies the product for higher prices as are offered on the market and no price reduction is offered, |
| 1 - 4 points | supplier supplies product for the price on the market and is not possible to deal some lower price, |
| 5 - 8 points | supplier supplies product for the market price and is possible to give a price reduction if the demand is high, |
| 9 - 10 points | supplier supply product for a lower price as on the market and is possible to give a price reduction. |

It is also need to create some other criterions for evaluation of supplier. If the other criterion has not the same degree of importance for organisation is need to give to criterion some weight. The importance of the criterion we determine with comparison between them, if we define 3 degrees of comparison:

- 0 - the less weighty quality**
- 1 - the same weighty quality**
- 2 - more weighty quality**

Also is need to compare criterion and to do sum of point for each criterion in line (b) and column $\sum b_i$. Than we count coefficient of weighty (q) for each quality, which represents the weight of criterion. [2] The process is in the table 1.

$$q_i = \frac{b_i}{\sum b_i} \quad (1.1)$$

After point allocation of supplier for criteria we must evaluate the suppliers following this calculation:

Supply evaluation = criteria x importance

Following total points we ranged the supplier into 3 categories:

- **The supplier A:** **7 – 10 points**
- **The supplier B:** **4 – 6 points**
- **The supplier C:** **0 – 3 points**

The supplier A – responsible supplier - supplier accepted our asks and we can start business cooperation. All suppliers will be valued, min. 2 times a year.

The supplier B – good supplier – purchase can be realised only in case, if we do not have any other from the "A", if suppliers have 4 points, it is need to make some measures.

The supplier C – risk supplier – we suggest to refuse purchase.

According to this methodics we can evaluate ana suppliers. Example of supplier evaluation form is in table 1.

Table 1. Example of supplier evaluation form [2]

| Supplier evaluation | | | | |
|--------------------------------------------------------------------|-------------|------------|-------------|---------|
| The name of company: | | | | |
| The name of supplier: | | | | |
| Address: | | | | |
| Kind of product: | | | | |
| Criteria: | points | importance | conjunction | comment |
| Price of product | 8 | 0,08 | 0,64 | |
| Certificate of QMS | 8 | 0,14 | 1,12 | |
| Sales returns | 8 | 0,04 | 0,32 | |
| Dead-lines and flexibility | 9 | 0,11 | 0,99 | |
| Payment conditions | 5 | 0,11 | 0,55 | |
| Reference and position on the market | 8 | 0,12 | 0,96 | |
| Quality | 10 | 0,18 | 1,8 | |
| Guarantee | 5 | 0,03 | 0,15 | |
| Assurance of delivery | 0 | 0,04 | 0 | |
| Compliance of capability | 10 | 0,14 | 1,4 | |
| Completely | 7,93 | | | |
| Abstraction of supplier (A,B,C): A – responsible supplier | | | | |
| Valuation executed by: | | | Date: | |

4. SUPPLIERS EVALUATION THROUGH SOFTWARE SUPPORT MICROSOFT EXCEL.

Each enterprise works daily with a large amount of information which needs for effective management and decision making in any area of their activities. Otherwise it is not in the field of management and cooperation with suppliers because quality of inputs into the company can affect the quality of future outputs. So is therefore necessary to choose an effective way of selecting and evaluating suppliers, which provide the required inputs. [6]

The entire system of selection and evaluation of suppliers should be transparent, consistent and in particular to provide relevant information necessary to effectively manage relationships with suppliers. All these conditions satisfy many information systems, which have one disadvantage. It is their price. Therefore, we decided to use the evaluation of supplier's available software, which is Microsoft Excel.

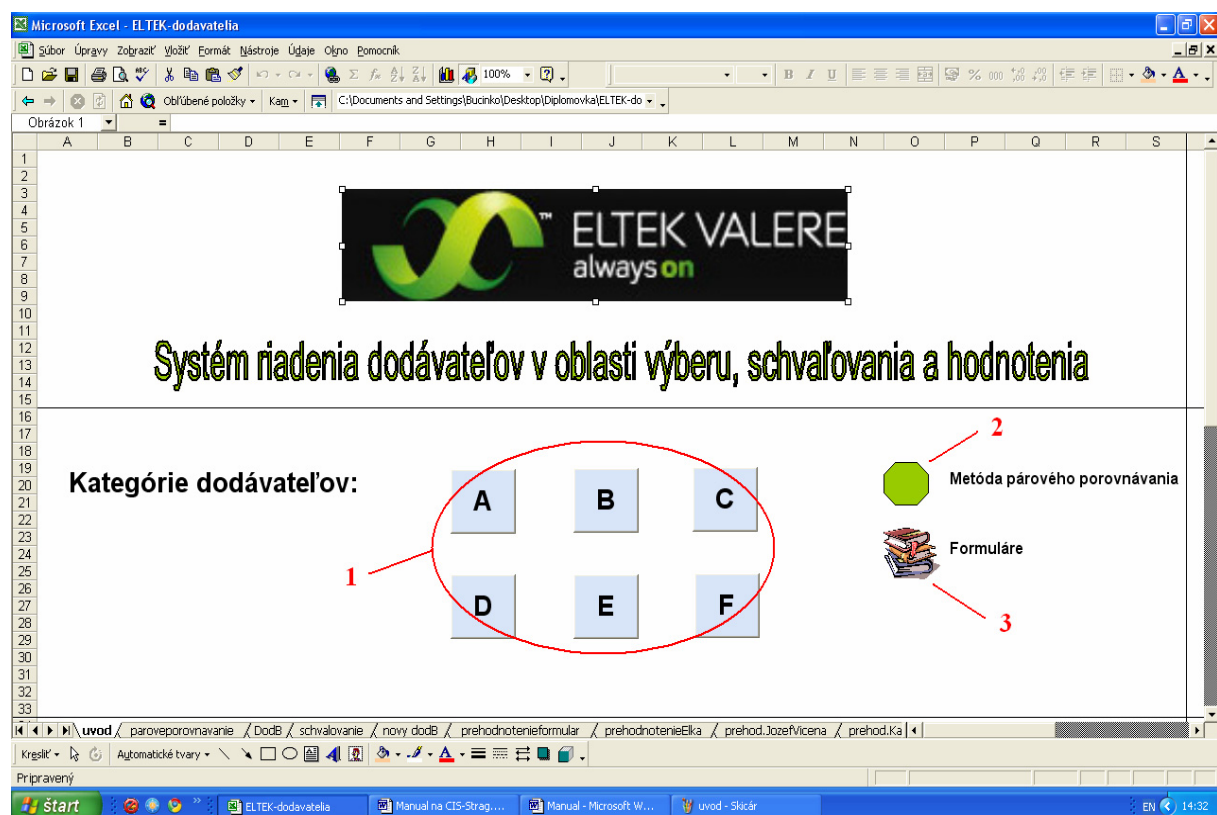


Figure1. The main page of suppliers evaluation system [8]

The basis of the whole system is the transparency of information of companies suppliers', their subsequent categorization and easier handling with information that are necessary for everyday decision-making through a simple and accessible system such as Microsoft Excel. Figure 1 shows the main page of supplier's evaluation system.

Microsoft Excel - SK_FORM_573-S Supplier Questionnaire Form SLOVAK

Hlavný dotazník dodávateľa (SQM)

1. Všeobecné informácie o dodávateľovi

Má byť vyplnené dodávateľom okrem "Dotazníka"

Celý názov spoločnosti podľa zákona: ELKA a.s. **Adresa:** Kremnické Bane 37, Kremnica **PSČ:** 967 01

Meno riaditeľa spoločnosti: Milan Šlaifčan **Predaj:** Predaj celkom: TEK za jan. 5293,9 Export percent: 1,81 % Eltek za jan.

Meno manažéra pre kvalitu: Jarešlava Klčová **Počet zamestnancov:**

Najdôležitejší subdodávateľia využívaný pre: Metalvis

Mechanické časti: Zmluvná výroba: Galvanokov, Vikanová **Výroba:** 69

Stroje: Trumf Slovakia **Kvalita:** 2

PCB: **Iné:** 24

Magnetizmus: **Celkom:** 95

Kontaktné údaje:

| Komunikácia | Meno | Email | Telefon | Fax | Iné/poznámka |
|-------------------|------------------|--------------------------|------------|-----|--------------|
| Predaj/objednávky | Zuzana Váľová | zuzana.valova@elka.sk | 0905973335 | | |
| Kvalita | Jarešlava Klčová | jarešlava.klčová@elka.sk | 0908900526 | | |
| Výroba | Zoltán Beccáry | zoltan.beccary@elka.sk | 0905973336 | | |
| Výskum a vývoj | Katarína Tothová | katarina.tothova@elka.sk | 0918672399 | | |
| Nákup | Daniela Brlková | daniela.brlikova@elka.sk | 0905768405 | | |
| Expedícia | | | | | |

Pripomienky:

Dodávateľ je schválený dodávateľom Eltek Valere s.r.o. s podmienkami a pripomienkami uvedenými v tomto reporte / Pri naslednom audite budú preverené nedostatky uvedené v tomto reporte

General Info / Summary & Definitions / Receiving / Inspection / Warehouse / Purchasing / Production / Final Test / Traceability / Shipping / RDSE / Metrics / Corrective actions / QMS / EMS / S...

Figure 2. The general information about the supplier [8]

The entire system allows for easy manipulation of information that can be changed as needed. Makes it easier to evaluate the quality of suppliers and their capacity to meet the quality requirements of inputs. Figure 2 and 3 shows the forms for the evaluation of the quality of individual suppliers based on criteria that are important for the company.

Microsoft Excel - SK_FORM_573-S Supplier Questionnaire Form SLOVAK

Hlavný dotazník dodávateľa (SQM)

SUMÁR

| Oblasť | Závažnosť | Bodovanie oblasti | Max k dispozícii | Vážené hodnotenie | Kľúčové zistenia |
|----------------------------------------|-----------|-------------------|------------------|-------------------|-----------------------------------------------------------|
| Prijem | 0,05 | 85 | 100 | 4,25 | |
| Kontrola na prijíme | 0,05 | 79 | 100 | 3,96 | |
| Sklad | 0,05 | 63 | 100 | 3,13 | |
| Nákup | 0,05 | 90 | 100 | 4,50 | |
| Výroba | 0,10 | 69 | 100 | 6,92 | |
| Konečná skúška | 0,10 | 70 | 100 | 7,00 | |
| Sledovateľnosť výrobkov | 0,10 | 38 | 100 | 3,75 | |
| Expedícia | 0,05 | 75 | 100 | 3,75 | |
| Výskum a vývoj a systémové inžiniersvo | 0,05 | 25 | 100 | 1,25 | |
| KPI a meratele | 0,10 | 73 | 100 | 7,27 | |
| Nápravné a preventívne opatrenia | 0,10 | 85 | 100 | 8,50 | |
| Systém riadenia kvality | 0,05 | 58 | 100 | 2,88 | |
| Systém environmentálneho manažérstva | 0,05 | 33 | 100 | 1,63 | |
| Bezpečnosť, ochrana a zariadenia | 0,05 | 58 | 100 | 2,88 | |
| SA 8000 | 0,05 | 29 | 100 | 1,45 | |
| VÁŽENÉ HODNOTENIE CELKOM | | | 100 | 63,11 | Závažnosť x hodnotenie oblasti = vážené hodnotenie |

* Hodnotenie oblasti: Celkom použiteľných bodov / Maximum použiteľných bodov

Hodnotenie každej oblasti menej než 80 % a každé "Kľúčové zistenie" na sumárnej strane musí byť adresované dodávateľom ako odzva písomného nápravného opatrenia manažérovi kvality do Eltek Energy Quality Manager - Zmluvná výroba. Odpoveď musí obsahovať plán nápravných akcií spolu s dátumami dŕoh pre kontrolu a implementáciu. Odzova musí byť prijatá do 15 dní od dátumu obdržania tejto správy.

Dodávateľia musia získať a udržať 75 % alebo viac, aby boli považovaní za kvalifikovaného dodávateľa.

General Info / Summary & Definitions / Receiving / Inspection / Warehouse / Purchasing / Production / Final Test / Traceability / Shipping / RDSE / Metrics / Corrective actions / QMS / EMS / S...

Figure 3. The results of supplier quality [8]

CONCLUSION

The problem of evaluate and choose a supplier is component of each company with a good system of quality. The suitable manner of choice and evaluation of suppliers should be one part of managing in each company either the separate choice in on the other company and is individual decision of management. This management decides what manner and criterion is suitable, if they want to meet the needs of company, because if the company has not quality inputs, they cannot produce quality outputs.

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QUALITY HARMONIZATION OF WOOD FLOORING EXPORTED FROM SERBIA WITH REQUIREMENTS OF THE EU TECHNICAL REGULATIONS IN THE FUNCTION OF INCREASING THEIR COMPETITIVENESS

Branko Glavonjić, Milan Nešić, Slavica Petrović, Predrag Sretenović

Abstract

The paper³ presents the results of researching technical regulations referring to the area of wood flooring production and trading in the European Union. The research included technical regulations which refer to directives, standards and certificates and thus the requirements which wood flooring traded on this market has to fulfill. A special aspect of the research referred to researching terms and criteria for CE marking of wood flooring and the connected procedures that need to be conducted in order to place a CE mark on a product. A separate part of the paper presents the current situation of CE marking for wood flooring produced and exported from Serbia.

Key words: wood flooring, technical regulations, CE mark, procedures.

1. INTRODUCTION

Directives are written documents which regulate the public interest of people's health and safety, protection of consumers, business transactions and environment. The European Union is making a unique market on which technical harmonization, mutual acknowledgement and elimination of technical barriers will be valid. Directives are equal for all and everybody has to observe them. In the hitherto process of adoption and functioning, directives have often changed influenced by technical progress, approval of national governments and have contained numerous standards and technical requirements.

By creating the unique market, the Union has set general and important laws with which it has reduced the control of the member states' national bodies and it has established quality provision and techniques for marking the conformity of products pursuant to the needed norms. Products placed on the EU market have to comply with general requirements for free movement, while directives for a product group prescribe certain harmonized standards, which producers can select to a certain degree when conforming their products to the requirements stated in those standards.

The New Approach Directives refer to the products placed on the EU market for the first time, secondhand and used products from the third countries which had been produced before a directive became effective. Directives often complement each other and refer to others. A producer can get assistance from organizations for standardization in finding harmonized standards for a particular product of interest.

2. PAPER SUBJECT AND AIM

Research subject in this paper is the European Union technical regulations with special highlight on the New Approach Directives which refer to construction products (89/106/EEC), product liability (85/374/EEC) and general product safety (2001/95/EC). The aim of this paper is to analyze to what extent wood flooring exported from Serbia onto the European Union market fulfills the requirements of

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the abovementioned directives as well as the situation in Serbia regarding the harmonization of technical regulations in the area of wood products with the European Union legislation.

3. EUROPEAN UNION NEW APPROACH DIRECTIVES FOR WOOD FLOORING AND CE MARKING

In order to place their products on the European Union market, companies from Serbia have to fulfill a series of conditions. Some of those conditions are: functionality, appearance, competitive price, delivery time, necessary quality for a certain product category (meeting the requirements and expectations of buyers), effective marketing and others. These conditions are not legally binding in market economy, but still most companies have to fulfill them in order to secure their market share.

However, when exporting the producers must know that a product has to comply with **legal requirements in effect in the importer's country** as well apart from the market requirements. Legal requirements always refer to the **safe usage of a product**, namely, to the elimination or reduction of potential dangers to the prescribed allowed level.

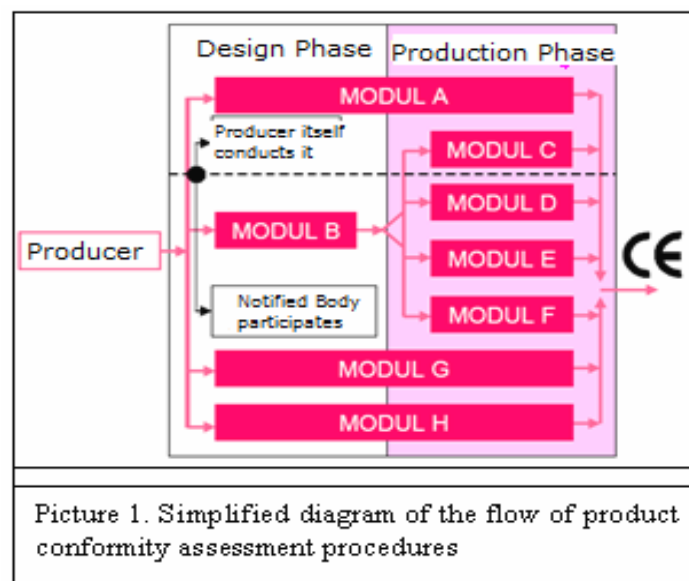
Legislation on product safety in the European Union is roughly divided into two areas:

- Old Approach which includes motor vehicles, food, chemicals, medicines for human and veterinary usage and
- New Approach which includes technical industrial products.

Wood flooring producers have to identify adequate **legal enactments and regulations** which refer to their products. For the European Union market, obligatory safety requirements are defined in adequate annexes of the applicable New Approach Directives and they are the so called **essential health and safety requirements**.

Essential requirements are outlined in such a manner so as to provide a high level of people and environment health and safety protection. They are obligatory and therefore only the product which fulfills essential requirements can be placed, traded and used on the EU market. Essential requirements define the results which have to be reached or risks which have to be dealt with. They do not specify or anticipate technical solutions for achieving those results. Therefore, **producers have to conduct danger and/or risk analysis** and determine the conformity degree of their products with the essential requirements. This analysis has to be an integral part of technical documentation (file) which accompanies products. Flexibility of the New Approach allows the producers to select adequate technical solutions and technology in order to fulfill essential requirements. In this way, for example, material selection or product design can be in conformity with technical progress.

New Approach Directives do not contain information on the manner how essential requirements can or should be fulfilled. One of the ways is product conformity with the criteria stated in the European standards. Their usage facilitates the free flow on the unique EU market. Essential requirements are stated in the New Approach Directives. Harmonized standards provide detailed specifications concerning the practical fulfillment of essential requirements. However, one standard does not include all essential requirements of a directive. Harmonized standards can contain only one or several essential requirements. **The implementation of harmonized standards is voluntary** but nevertheless advisable for producers from Serbia. A producer can always choose a different way for fulfilling essential safety requirements such as, for example, usage of national (state) standards, but in such a situation it is more difficult to prove the conformity with the essential requirements of the EU directives. Besides, the usage of other means requires much more time and money.



The European Union legislation sets adequate procedures for conformity assessment pursuant to potential risk and thus the required protection levels. Products included in New Approach Directives have to be subjected to the procedure of conformity assessment prior to market placement. Picture 1 shows the simplified diagram of the flow of conformity assessment procedures defined in the New Approach Directives.

On the flow diagram given on Picture 1, a producer whose product is included in the New Approach Directives is on the left side and it should have **CE** mark. The producer is the one who, concerning the risks of the product, chooses the most appropriate “ways” (modules) defined in the relevant directive/directives to obtain a **CE** mark. These procedures have to be followed in order to obtain the **CE** mark. All New Approach Directives give the scope and content of potential conformity assessment procedures.

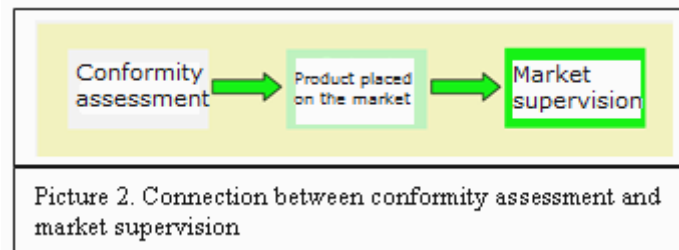
Eight modules for conformity assessment thus range from the simple ones which allow the producer to perform interior checks and make the Declaration of Conformity itself to extremely complex checks of each product element performed by a notified control organization. Depending on the risk, adequate model for conformity assessment is determined for each product (e.g. toys are of low risk, while certain types of machines are of high risk and as such they require independent examination by a notified control organization).

From this diagram it can also be seen that conformity assessment includes:

- Product design phase,
- Production phase,
- Or both phases and that some of the modules require intervention of a notified body.

Free flow of goods within the unique market of the European Union is legally based on the European legislation for products. Law implementation system in the European Union is designed in such a manner that the **unfulfilling of safety, health and environment requirements is sanctioned with corrective measures**. In this way, not only the product user but also the producer is protected from unfair competition. **Product control on the market, or market supervision, is an inseparable part of the law implementation system in the area of product legislation**. In the European Union member states, market supervision is within the competence of the state or its local authorities.

As it can be seen on Picture 2, conformity assessment is done **before** product placement on the market, while market supervision is done **after** product placement on the market.



Product conformity with the New Approach Directives is checked by:

- **Producers** (before placing the product on the market),
- **Customs officers** (upon entrance of a product with non EU origin)
- **Bodies for market supervision** (after placing the product on the market) and
- **Judiciary** (when an incident occurs).

Pursuant to the Directive 89/106/EEC, essential requirements which construction products, and thus wood flooring as a part of these products, have to comply with are the following:

- Mechanical strength and stability,
- Safety in case of fire,
- Hygiene, health and environment,
- Safe for usage,
- Noise protection and energy saving and
- Heat retention.

The simplest way of proving the conformity of wood flooring with the essential requirements is the usage of the European harmonized standards. Those harmonized standards which refer to specific products, namely, types of wood flooring should be chosen on the list of standards that accompany the Construction Products Directive.

For the purpose of defining values of certain characteristics of wood flooring elements, researches are being conducted in international accredited laboratories pursuant to the procedures defined in adequate harmonized standards.

3.1. CE marking

CE mark is an administrative mark ("**passport**") and it shows that a product:

- Is designed and produced in accordance with essential health and safety requirements of all relevant directives,
- Was subject of adequate conformity assessment procedures in accordance with all applicable directives.

CE mark:

- Is obligatory for products included in New Approach Directives,
- Has to be affixed by the producer or its authorized representative-importer,
- Is directed towards institutions of **market supervision** system,
- **Is not a quality mark,**
- **Is not a mark of origin,**
- Has to be affixed on the product/package/ and accompanying documents,
- Has to be visible, readable, indelible,
- Cannot be combined with quality marks,
- Has to be affixed after obtaining EC Declaration of Conformity,
- Can contain identification number of notified body (if included in the conformity assessment procedure in production phase).

CE mark cannot be affixed on products which are not included in the New Approach Directives. Placement of **CE** mark is required by law, it is not placed out of competitive reasons and all producers whose products are included in the stated directives have to affix it.

New Approach Directives forbid affixing marks similar to **CE** mark which can mislead the buyer by suggesting meanings similar to the meaning of **CE** mark.

By affixing that mark on a product, the producer guarantees that it has passed all prescribed procedures for proving conformity in the authorized bodies. Directives prescribe possible ways for assessing product conformity and the producer can choose one of eight possible ways which suits it most. Modules, or the ways for proving, differ by complexity depending on the product complexity and possible danger for the user.

3.2. Procedure for Affixing CE Mark on Wood Flooring

CE mark is generally the symbol of product conformity in the sense that it has fulfilled all requirements prescribed by the European Union directive for that product and that it has been subjected to certain procedures for conformity assessment. In order to affix **CE** mark on wood flooring it is necessary to conduct adequate procedure. It consists of the following steps:

- 1) Determining which **directive** (or directives) refers to a certain product (in the case of wood flooring it is the Directive 89/106/EEC for construction products). If there are no EU regulations applicable to a certain product, the principle of mutual acknowledgement is applied.
 - a. It is necessary to check if the product is subject to Old Approach Directives (e.g. chemical products), because only the products included in the New Approach Directives require **CE** mark
 - b. It is necessary to check the directive activation date. All directives have a transitional period when a producer can choose whether to apply national regulations or provisions of the new directive.
- 2) Determining the **conformity assessment procedure** which should be applied. The procedure depends on the product and directive. Sometimes only the producer's declaration is enough and sometimes the assessment of a notified body or even a combination of the above mentioned.
- 3) Determining the list of **harmonized European standards** for a certain product. Although not obligatory, European standards are almost always the easiest way to apply directive requirements.
- 4) Check if the product is **in accordance with the requirements** of the directive
- 5) Determine if it is necessary for an **independent third party** to assess conformity. This is stated in the directive itself and depends on the product type. **CE** mark cannot be affixed before all necessary certificates are collected.
- 6) Prepare **technical documentation**
- 7) Prepare **Declarations of Conformity** and the necessary documentation which proves that.
- 8) Check if the country onto whose market a product is placed has certain **additional requirements** (national standards, marking or packaging)
- 9) Affixing **CE mark** on a product and/or package and documentation.

For affixing **CE** mark for wood flooring it is necessary to conduct the procedure in accordance with the European harmonized standard EN 14342:2005+A1:2008. The most important provisions of this standard are presented further in the text.

4. WOOD FLOORING CHARACTERISTICS, CONFORMITY ASSESSMENT AND MARKING PURSUANT TO THE HARMONIZED STANDARD EN 14342:2005+A1:2008

Clauses of this European standard presented in this Annex fulfill the requirements of the mandate given with the European Union Directive for construction products (89/106/EEC) for rigid flooring products as described in Table 1.

The conformity with these clauses leads to an assumption that the products (wood flooring) are suitable for usage and the stated purpose, which has created conditions for implementing the procedure of CE equalizing.

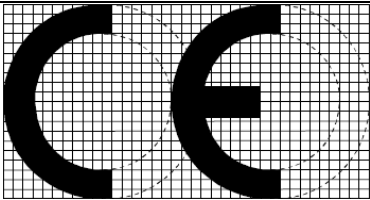
Table 1. Essential characteristics tested in wood flooring pursuant to the clauses of EN 14342 Standard as the basis for conducting the procedure of CE marking

| Essential characteristics | Requirement clauses in this standard (EN 14342) | Mandated classes | Notes |
|-----------------------------------------------|-------------------------------------------------|---------------------|-----------------------------------------------------------------------------|
| Reaction to fire | 4.2 and 5.1 | Classes A1fl to Ffl | According to EN 13501-1 or Table 1 |
| Emission (release) of formaldehyde | 4.2 and 5.2 | - | Class E1 or E2 according to Annex A |
| Emission (content) of pentachlorophenol | 4.2 and 5.3 | - | No indication if PCP \leq 5 ppm and "PCP \leq 5 ppm" in all other cases |
| Breaking strength* | 4.2 and 5.4 | - | Max load (in kN) (and span distance (in mm)) |
| Slipperiness | 4.2 and 5.5 | - | Value determined according to CEN/TS 15676 |
| Thermal conductivity | 4.2 and 5.6 | - | Value (in W/m K) determined according to EN 12664 or taken from Table 2 |
| Durability (biological) | 4.3 | - | Class according to EN 335-1 and EN 335-2 |
| * Applies only for self-supporting floorings. | | | |

Attestation of wood flooring conformity has to be performed in accordance with the procedures and terms (values) stated in the tables from ZA.3.1 to ZA.3.3. which result from the application of the clauses stated in the EN 14342 Standard.

When full conformity of the tested wood flooring with the conditions from the stated tables of this standard is achieved, regulatory (certification) body should make a Declaration of Conformity (e.g. EC Certificate of Conformity), which entitles the producer to affix CE mark on its product. Before the act of affixing CE mark on the product, the producer has to make a declaration with all information relevant for CE marking. An example of such a declaration for wood flooring is given in Table 2.

Table 2. Example of a declaration of wood flooring producer with information significant for CE marking

| | | |
|------------------------------------------------------------------------------------|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
|  | | CE conformity marking, consisting of the "CE" symbol given in Directive 93/68/EEC. |
| Neko Co Ltd. 08 | | Name or identifying mark and registered address of the manufacturer. Last two digits of the year in which the marking was affixed. |
| EN 14342:2005+A1 Solid parquet strip with tongues and grooves, to be nailed | | Number of this European Standard Description of product and intended use |
| Reaction to fire | C _{fi} -s1 | Information on regulated characteristics. |
| linked with the minimum mean density and the minimum overall thickness | 500 kg/m ³ 20 mm | |
| Emission of (release) formaldehyde | E1 | |
| Emission of pentachlorophenol | > 5 ppm | |
| Breaking strength (max. load) and span | 200 N and 400mm | |
| Slipperiness | USRV 100 | |
| Thermal conductivity | 0,17 W/m K | |
| Biological durability | Class 1 | |

Abovementioned declarations and certificates, if any, should be presented in the official language or the languages of member states in which the product will be used.

Current situation regarding the obligation to affix CE mark for wood flooring in the European Union is such that in the last two years it has been postponed for the third time and the new starting date for its implementation is March 1, 2010. Until then, all producers, exporters, distributors or agents dealing with wood flooring production or trade have to finish all necessary preparations in order to be ready on the mentioned date.

4.1. Current Situation Regarding CE Marking for Wood Flooring in Serbia

As regards the Republic of Serbia, which is on the way to become a member of the European Union, a certain number of new technical regulations has been adopted, among which the Law on Standardization and the Law on Accreditation are the most important. Apart from these two laws, a certain number of technical rulebooks and regulations have been adopted or are being prepared.

From the day when a new technical regulation becomes effective until the Republic of Serbia's accession to the European Union or when the International Agreement on Conformity Assessment and Adoption of Industrial Products with the EU becomes effective, products traded on the Serbian market have to be marked with special conformity mark (usually those are only attestations or certificates).

Since the new deadline for obligatory CE marking for wood flooring in the EU is postponed until March 1, 2010, producers and exporters from Serbia have obtained additional time to prepare themselves and conduct all necessary procedures for getting approvals for affixing CE mark on their products. Additional reason for this is that so far none of them is entitled or uses CE mark on their products. Beside producers, additional problem is insufficient equipment and thus the impossibility of accreditation for issuing attestations and certificates by the existing control organizations (laboratories). Therefore, the postponement of the stated deadline will be of use both for producers and the control organizations.

5. CONCLUSIONS

The quality of wood raw material in Serbia (first of all oak, beech, hornbeam, locust, ash and maple) which wood flooring is made of is satisfactory from the point of foreign consumers' requirements. For the placement of wood flooring on the unique market of the European Union it will no longer be sufficient only to highlight the quality of wood flooring from Serbia through its technical and aesthetical characteristics as well as the characteristics of wood species, however, from March 1, 2010 it will be obligatory to affix CE mark as a sign of product safety and security pursuant to the New Approach Directive which refers to construction products.

Since both producers and control organizations are totally unprepared for conducting procedures of CE marking for wood flooring in Serbia, it is necessary to start with those activities as soon as possible. Otherwise, all producers and exporters of wood flooring from Serbia will not be able to place their products on the European Union market from March 1, 2010. This paper is a humble contribution to producers regarding the understanding of importance and procedures necessary to be conducted for obtaining the right to affix CE mark on wood flooring.

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QUALITY MANAGEMENT IN FLAT ORGANIZATIONAL STRUCTURES

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Abstract:

The development in the area of the quality management goes forward. The present forms of applying the quality management do not suit to trendy methods of management any more. Solving the issues of the quality management in flat organizational structures should help to specify relations and mutual bonds on particular levels of management following new requirements in the area of the quality management.

Key words: quality management, flat organizational structures, process

1. INTRODUCTION

At present the economy in most countries is facing the world crisis. Everywhere there are talks about it and world experts are looking for the ways how to mitigate it. Every person who deals with economic theories knows that there are sinusoidal cycles in economy and that sooner or later there must have come something like that. However the question is how the business environment will tackle such situation, who will survive and who will not? The fight for survival will certainly be cruel for some companies and the companies will try to use all the tools to succeed in a competitive environment.

One possibility how to have something more than others may not have, what would make us different from being middling, is introducing the quality management systems, certification of products, the personnel, etc. Then, however, there is another question, how it is possible that, in spite of the fact that the number of companies being proud of certificates of various kinds is rapidly growing, these companies go bankrupt and they cannot adapt to changing market conditions with flexibility? How is it possible that the companies producing the quality products fail to sell them and vice versa, the companies producing the products of lower quality can find the final consumers? Maybe it is necessary, immediately in the introduction, to emphasize the idea of Charles Darwin that the majority of those who are the biggest and strongest will not survive, but those who can adapt quickly will survive.... My work will deal with the adaptation of the quality management in companies in such a manner that the principles of process orientation will be preserved. The existing forms of the quality management do not suit to trendy requirements and they rather become an impediment.

2. ORGANIZING THE QUALITY

In recent years, building and implementation of the quality systems based on ISO standards series 9000 is considered as a basic form of organizing the quality. Such form of organizing the quality is needed if the customer requires a certificate from its supplier that the supplier's quality management system meets the requirements of relevant ISO standards. However, if the customer does not impose such requirement, it would be advisable to use other forms of organizing the quality, which would take into account the specific features of the given company. (1)

Process Orientation in the Quality Management

The word **process** is used in many meanings at present, therefore we should differ how this term is perceived e.g. by company managers who rather identify the term "process" with production, technological or financial processes, as well as legal ones. To explain that the term "process" is understood as a set of activities regulated by certain rules and principles and that at the beginning there are inputs which enter it and that the result is one or more outputs, it is evidently not necessary. These facts are more or less known for the professional public. But the fact that each process should have its owner who is responsible for the whole process from the beginning to the end, who coordinates the process and that the substantial feature justifying the existence and operation of the whole process is added value, whether in a material or immaterial form, this is not so clearly declared in the practice.

In the literary sources can meet various aspects of the division of processes. ISO standards divide processes to: main, managerial and supportive ones. In other literature (which is not specified in more details) there is the division to macroprocesses, processes, miniprocesses and microprocesses or to key processes, inter-company processes, processes for the best competitiveness, cost processes and others. We could continue for a long time. Each author has his/her own guide to the division of processes. The practice will show which division will be useful for it. The companies which have implemented the quality management system use the division of processes recommended by ISO 9000 standards. This could generally be accepted if the whole system of management is adapted to the given division. Unfortunately, in the majority of companies, even after adopting the process-oriented quality management system, organizational relations remain on the level of hierarchical (multi-level) organizational structures what has nothing common with the process orientation. The course of each process is flat - horizontal. How should the quality management be organized?

The present practice, recommended also by ISO standards, is typical for the existence of the centred oriented department for the quality management, especially focusing on and providing activities in the following areas:

- a) general needs in the quality management such as e.g. preparing the company quality policy, drafting the main objectives in the field of product quality, developing plans and programs for the determined objectives, proposing the quality assessment system, inspections of the quality and output reports for the top management;
- b) preparation and development of new products such as: ascertaining the requirements of customers for individual product parameters, analysis of the reliability of products, judgment of the product design in terms of various objectives related to the product quality, draft of the programmes of tests for the development of materials, processes and products, estimation of the costs on quality and losses from non-quality production for the designed product and others;
- c) relations with suppliers such as making a plan for monitoring the quality of deliveries, making a survey of prospective suppliers in terms of their ability to comply with the required quality of deliveries, supervision over the deliveries, provision of assistance to suppliers in measurement, control, training of workers, etc., organizing inspections and tests of deliveries and giving feedback and others;
- d) manufacturing process, such as judging and monitoring capabilities of manufacturing processes, following determined requirements, designing and making plans for the control of processes, implementation of the inspection of processes and supervision over the processes, proposal for evaluating the conformity of products with the product design and others;
- e) control and testing; it is the proposal of control methods for individual control points and a precise definition of the sequence of steps and operations in the implementation of control activities in the relevant unit, development of specifications of control activities,

- selection, selection and training of inspectors, the proposal of the procedure for non-conformed products and others;
- f) organization of metrology issues, where the quality control department is in charge of the design of fixtures, tools and control equipment, construction, production or the purchase of necessary I & C technology, provides the calibration of the measurement technique, proposes procedures and rules for maintaining the accuracy of measurement technique and others;
 - g) relations with customers such as testing of finished products and conformity assessment of product features with the requirements of customers, monitoring and evaluation of results and influence of post-productions operations to the product quality, the analysis of complaints of customers, the costs on guarantee repairs, suggestions for corrective actions, identification of customers' requirements for the participation in the quality assurance and development of proposals for implementation of this participation,
 - h) consultations and training that focus on the analysis of losses from non-quality production, determination of the main sources for further improvement, supporting and stimulating the company-wide approaches to developing the quality of manufactured products, design and implementation of training courses aimed on methods and tools for the quality assurance. (1)

In accordance with new trends of the company, all the above activities would be redistributed from the department of quality control to the existing departments. It means that the quality control departments as central bodies within hierarchical organizational structures should cease to exist and such operations as production and inter-operation control, the quality assurance in production, application of statistical methods, quality planning, motivating the employees to improve the quality, etc. should be transferred to the competences of other departments.

Again, it should be stressed that the ISO standards do not take into account flat organizational structures.

3. DIFFERENCES BETWEEN HIERARCHICAL AND FLAT ORGANIZATIONAL STRUCTURES

Hierarchical organizational structure

This type of structure is traditional, we may say, the most widespread concept of the company organization in our country, but also abroad.

Hierarchical thinking is somehow internally encoded in us, because it was valid in the past and it is still valid at present. The hierarchical structure is a sign of the mass production from the past, but at present it is an impediment to individuality and the necessary changes, since it is inflexible and expensive.

Hierarchical organizational structures are typical for:

- superiors and subordinates and their continuous fight, not always with good mutual communication;
- interest in local limited attitudes and matters; not having interest in issues that were not relevant to them;
- creating clans and non-transparent associations having the practices of mafia;
- supporting the bureaucracy that often stops any kind of communication;
- creating unnecessary inter-positions and control links;
- the fact that all persons wait for orders from superiors and they do not work without such orders;

- having orders and guidelines for everything and thus the independence and activity of workers is destroyed;
- protecting unqualified workers and supporting passivity and formalism;
- the fact that all operations connected with the hierarchical type of management are too expensive and inflexible with the whole range of management levels. (2)

If we think of the above-mentioned features of hierarchical organizational structures, we may get the answer to the question: Why the things which should work according to the principles of quality management do not work?

The opposite of hierarchical thinking and management is the process thinking and the process management. As we have already mentioned, a flat, horizontal structure must be the base. Then we can define the company process as the work from one employee (the team) to another employee (the team). (2)

The owner, who manages or coordinates leaders of individual teams which form the whole process, takes responsibility for such process. The whole process is focused on the customer's satisfaction, which can be both external and internal.

The process management is typical for the following features:

- everyone is motivated to achieve the common outcome;
- people are more cooperating in the process than fighting, what has an influence on the improvement of the company culture and mutual communication and cooperation;
- the process supports individuality, independence and quality of a man and thus may reduce the number of foremen and controllers;
- better workers stabilize in the process and the worse ones leave;
- the process allows changes in a better way;
- process and team relations are the fundamental principles of the system engineering;
- all involved parties are dependent on the outcome of the process, not only on the results of individual employees. (2)

This means that if the whole process is not productive and it generates losses, all persons involved should have no remuneration or benefits and vice versa if the process is productive, remuneration and benefits of all involved employees should be at least two times or three times higher than the average pay in the organization.

CONCLUSION

One of the principles of the quality management is **improving**. But the real improving in the quality management requires flattening of organizational structures, liberation of the line management from the enterprise management and removing so-called "hide-and-seeks" resulting from the hierarchical management. (2)

Therefore the change for the flat process systems with improved relations, communication and responsibilities is required.

Although the ISO standards describe in Sections 4.1. and 5.5., within the managerial processes, the following: determination of organizational structure, responsibilities and powers of determination (5.5. and 5.1. and documentation management (Standard STN ISO 10013 Guidance for the documentation of the quality management system, in the standard STN ISO 9001:2000 Section 1.2. Application it is literally written: *All requirements of this international standard are generic and are applicable in all organizations regardless of their type, size, and the quality of products*. But we cannot agree with such statement if we bear in mind the process approach. Each organisation may have different division of processes, their mutual relations and connections and also the whole process orientation should be narrowly specialized in concrete conditions and relations in a particular

organization. From this point of view, ISO standards rather fog the whole issues and it is quite common in the practice that companies are proud of the certificates from the field of the quality management according to ISO standards emphasizing the process orientation of the quality management system and in spite of it nothing is changed radically.

But if companies want to adapt to the present situation in a competitive environment, complicated by the crisis now, they must understand that the hierarchical system of management will not bring any major changes leading to prosperity.

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END-USER AWARENESS OF ENVIRONMENTALLY APPROPRIATE WOOD PRODUCTS IN SLOVAKIA

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ABSTRACT

This paper presents the results of market research aimed at the end-user awareness of environmentally appropriate products. The research was carried out in the Slovak Republic at the sample of 725 respondents with a particular attention paid to the perception of characteristics and properties of wooden products. Frequency tables were used to analyse the data.

Key words: environmentally appropriate products, wood products, end-user awareness.

1. INTRODUCTION

Consumers in growing numbers seek and prefer products without negative impact on the environment. By purchasing such products they support and contribute to the promotion of sustainable consumption. Kaputa (2006) points out that the most of the Slovak wood processing companies consider consumers as not environmentally sensitive and they think that there is not real demand for environmentally appropriate wood products. However, more than 60% of questioned companies anticipate changes in customers' preferences for environmental characteristics of wood products.

There are many different ways how consumers are informed on how product life cycle and use impact the environment. A number of programs and labels worldwide are available to assist consumers to make their purchasing decisions. Environmental labels and declarations can help consumers decide about products they buy and whether they are environmentally preferable. The overall goal of environmental labelling is to encourage the demand for, and supply of, those products and services that are environmentally preferable through the provision of verifiable, accurate and non-deceptive information on environmental features of products and services (Fivewinds, 2009). By enabling environmental criteria to be considered during purchasing decisions, labelling and certification programs help consumers to "vote through the marketplace" for more environmentally responsible products (Išid, 2009). Products bearing eco-label should have the potential to reduce certain negative environmental impacts, as compared with other products in the same product group. The characteristics of such products should address environmental factors which are of interest from the point of view of society and the environment.

Integrated product policy is the main tool of the EU, which seeks to minimise environmental impacts of products through looking at all phases of a products' life-cycle thus covering all the areas from the extraction of natural resources, through their design, manufacture, assembly, marketing, distribution, sale and use to their eventual disposal as waste in the whole production and consumption chain. The policy incorporates a variety of voluntary and mandatory tools including economic instruments, substance bans, voluntary agreements, environmental labelling and product design guidelines. The EU eco-label scheme (as laid down in the new Regulation (EC) No 1980/2000) is a part of this integrated policy. The objective of the Community eco-label award scheme is to promote products which have the potential to reduce negative environmental impacts, as compared with the other products in the same product group, thus contributing to the efficient use of resources and a high level of environmental protection. The eco-label may be awarded to a product possessing characteristics which enable it to contribute significantly to improvements in relation to key environmental aspects. Environmental requirements cover net environmental balance between the

environmental benefits and burdens, determination of the categories of environmental impact where the product under examination provides the most significant contribution from a life cycle perspective, and provisions for the extraction, production and processing raw materials and energy production. At the national level, the requirements criteria for determination and labelling of environmentally appropriate products are laid down in the law No. 469/2002 on the Environmental Labelling of Products. The label "Environmentally appropriate product" can be awarded to products fulfilling particular requirements on product characteristics. Assessment of the life cycle of products is based on evaluation of environmental aspects connected to air, water and soil protection, energy saving, natural resources management, global warming prevention, ozone layer protection, environmental safety, noise, and biodiversity. The national criteria fully comply with the EU labelling program. A questionnaire survey carried out by Rusko and Peková (2006) on Slovak consumer awareness regarding the environmental labels shows that consumer awareness is very low and only 38% of respondents recognise national environmental label for EAP.

Wood as a natural material has unique properties and serves for different purposes. It is considered to be ecological, aesthetic and renewable material with exceptional physical and mechanical properties. It is mainly used in construction, paper production, furniture making and a number of different related sectors and activities. Due to its versatility, each use of wood meets different substitutes at different segments of the market and therefore there are different criteria defined for every wood and paper product group. As of June 2009 EU environmental labelling scheme covered the categories of copying and graphic paper and tissue paper. The criteria for categories of wooden furniture and printed paper are recently under development. Apart from other criteria dealing with production processes and hazardous substances, the requirements regarding wood as natural material are covered under the criterion "Fibres –sustainable forest management". For copying and graphic paper a minimum 10% of virgin fibres originating from certified forests should be included in the products (there is a proposal to increase these share to 30-50%). The criterion for tissue paper includes a requirement for legality of all virgin wood fibres and a 50% share of fibres from certified sources. The proposed criteria for wood used for furniture production requires that all virgin wood fibres shall originate from sustainably managed forests and at least 50% for solid products and 20% for wood based products respectively from certified forests with additional requirements for legality and genetically modified trees.

The main aim of this research was to reveal the end users awareness of environmentally appropriate products with the emphasis on the perception of wood products attributes in Slovakia.

2. METHODS

A questionnaire survey was used to gather the data. The random sample was represented by 725 respondents from Slovakia. The questionnaire consisted of nine questions related to awareness of environmentally appropriate products with a particular attention paid to wood products and six questions related to the demographic data of respondents. The open-ended, close-ended and opened questions were used in questionnaire; some of the questions were multi-choice. The survey was conducted during the end of 2008 and beginning of 2009. A frequency analysis was used as to study the data.

3. RESULTS

Based on the analysis of demographic data a sample of 725 respondents consisted of 378 female. Over 38 % of respondents were between 21-30 years old. Some 69% of the sample concluded secondary education. Over 40% of respondents have an average income between 333 and 664 EUR per month, however there is group of young people (25%) with no regular income.

First of all respondents were asked (question 1 – Q1) to answer whether they would prefer purchasing of products they knew about that their use and production processes have the potential to reduce negative impact on the environment to the purchasing of common (conventional) products?. More than 70 % of the respondents said that they would buy environmentally friendly products if they known about them. More than 19 % respondents didn't know to answer the question (figure 1).

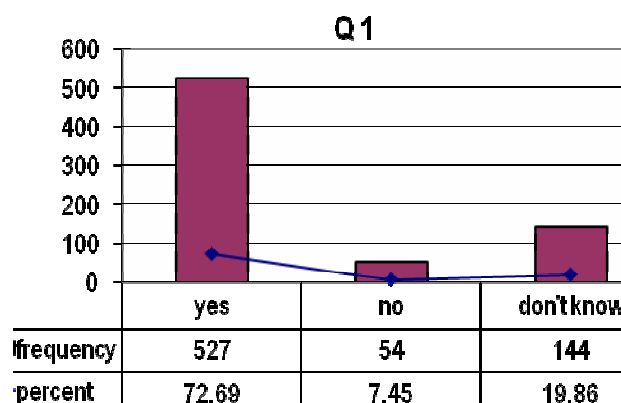


Figure 5. Results of Q 1

In order to find out how consumers consider wood products in comparison to some other materials we asked them (Q2) to indicate whether they consider wood products to have a lesser environment impact in comparison to products made of glass, metal and plastics. The results are shown in figure 2. Only 8.69% of respondents don't think that wood products are environmentally friendly. More than 16% of respondents didn't know to answer this question and only 6.62 % respondents think that they are not capable to consider this. Wood is considered as environmentally more friendly by 68% of respondents

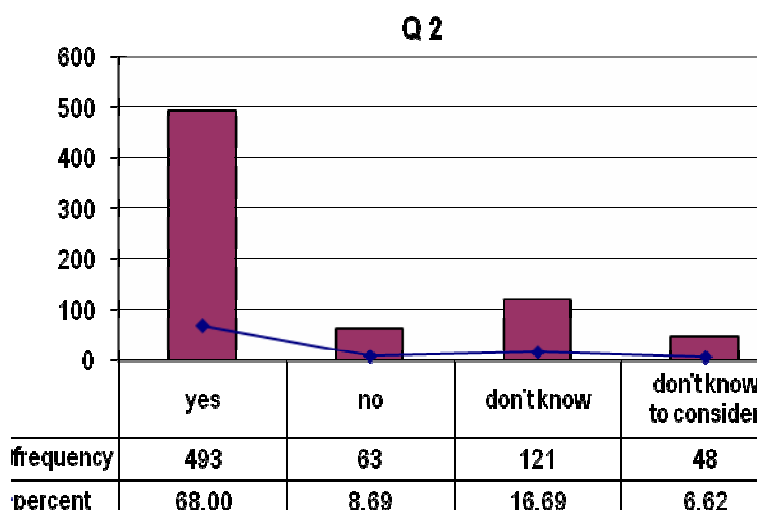


Figure 6. Results of Q 2

End-users perception of characteristics of environmentally appropriate products (EAP) is shown in table 1. Consumers were asked (Q3) about how they perceive differences between “environmentally appropriate wood product” (EAP) and common (conventional) wood product. This was a multi-choice question. Respondents could select from 9 different options.

Table 1 . Answers to Q3

| | EAP has better quality | EAP has longer durability | EAP is less harmful to the environment | EAP has better design | EAP is easily disposed after it has been used | Production EAP is more environmentally friendly | Price of EAP is higher | I cannot see any differences between them | other differences |
|------------------|------------------------|---------------------------|----------------------------------------|-----------------------|-----------------------------------------------|-------------------------------------------------|------------------------|-------------------------------------------|-------------------|
| frequency | 154 | 98 | 541 | 25 | 355 | 441 | 269 | 65 | 2 |
| Percent | 21.24 | 13.52 | 74.62 | 3.45 | 48.97 | 60.83 | 37.10 | 8.97 | 0.28 |

The most selected options were that “EAP is less harmful to the environment” and “Production EAP is more environmentally friendly”. Only 65 respondents didn’t perceive the differences between EAP and common product. This result indicates that there is a general understanding of the nature of EAP.

In connection with wood as a natural and renewable material we asked respondents (Q4) what they understand by the term “sustainable forest management”. We transformed the wording of the 6 Pan-European Criteria and Indicators for Sustainable Forest Management (SFM) and asked respondents to mark the order of all 6 statements or to choose option S7 - This term means nothing to me (table 2). The statements are as follows:

1. Maintenance and management of forests as a tool for tackling global warming (S1)
2. Effort to maintain forests in good health conditions (S2)
3. Production of wood and non-wood forest products (e.g. mushrooms etc.) (S3)
4. Effort to protect and maintain forest diversity (e.g. natural forests etc.) (S4)
5. Forest contribution to the protection of water resources and soil (S5)
6. Use of forests by people for recreation, rest, work and other activities (S6)

Table 2. Modus and weighted mean of answers to Q 4

| Statement | S1 | S2 | S3 | S4 | S5 | S6 |
|----------------------|-----------|-----------|-----------|-----------|-----------|-----------|
| Weighted mean | 2.90 | 2.54 | 3.96 | 2.98 | 3.63 | 4.98 |
| Modus | 1 | 1 | 5 | 2 | 4 | 6 |
| Final order | 2 | 1 | 5 | 3 | 4 | 6 |

As it follows from table 2, respondents tend to incline to the statements 1 and 2. Only 6.07 % of respondents didn’t understand the term SFM.

Requirements for origin of raw wood material included in EAPs are connected to sustainable forest management and independent party certification. Respondents were asked to indicate whether they ever heard of certified wood and wood products (Q5). More than 37% respondents were aware of this term, however more than a half of the sample has never heard about such wood (table 3).

Table 3. Answers to Q5

| | Frequency | percent |
|-------------------|------------------|----------------|
| yes | 274 | 37.79 |
| no | 397 | 54.76 |
| don't know | 54 | 7.45 |

Respondents had a choice to determine which products are in their opinion connected with the term EAP (Q6). Based on the results, more than 46% of respondents marked agricultural products, wooden furniture, wooden buildings, household and sanitary paper products, and office paper as environmentally appropriate. Other products had less than 15% (table 4). Approximately 10% of respondents marked plastic products and cleaning agents for households as EAPs (table 4). These results indicate that respondents link wood and wood products directly to the environment.

Table 4. Answers to Q6

| | office paper | agricultural products | household and sanitary paper products (toilet paper, tissues etc.) | leather products (shoes, jackets etc.) | wooden furniture | wooden buildings | plastic products (e.g. PET bottles) | cleaning agents for households | other |
|-----------|--------------|-----------------------|--------------------------------------------------------------------|----------------------------------------|------------------|------------------|-------------------------------------|--------------------------------|-------|
| frequency | 334 | 430 | 353 | 103 | 414 | 363 | 43 | 26 | 22 |
| Percent | 46.07 | 59.31 | 48.69 | 14.21 | 57.10 | 50.07 | 5.93 | 3.59 | 3.03 |

Statements connected to labels can have a significant influence on purchasing decision making of end-users. We have defined 5 different statements (Q7) and asked respondents which of them would stimulate them to buy product marked as environmentally appropriate (table 5).

Table 5. Answers to Q7

| | Statements | Frequency | Percent |
|---|----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|---------|
| 1 | Product is produced from materials sourced in a way that respected sustainable development of society. | 225 | 31.03 |
| 2 | Product has less impact on the environment compared to common (conventional) products. | 297 | 40.97 |
| 3 | Production process has ecological character. | 293 | 40.41 |
| 4 | By purchasing this product I contribute to maintenance of natural resources and environment for the future generation (my children, grandchildren etc.). | 400 | 55.17 |
| 5 | By producing this product manufacturers contribute to the wealth of the entire society (they do not follow only their own interests). | 125 | 17.24 |
| 6 | All statements. | 98 | 13.52 |
| 7 | Non statement. | 27 | 3.72 |

More than 55 % respondents marked the statement No. 4: "By purchasing this product I contribute to maintenance of natural resources and environment for the future generation". This indicates that a kind of "heritage for future generation" should be emphasised in promotion of natural resources and sustainable forest management. It is obvious that people can perceive the importance of society efforts as well as a potential negative influence of any crisis in direct connection with themselves and their families.

Question 8 was aimed at the determination of influence of different factors on buyer decision process when purchasing wood products – office paper, wooden furniture and wooden buildings in particular. The following set of factors was considered: country of origin, quality of product, design, environmental labelling of product, price, warranty, other consumers recommendations, product availability, easy disposal after use, product brand, and advertising. As for office paper the factor "price" has the strongest influence on buyers' behaviour. The other factors had a neutral influence or weak influence. As for wooden furniture four factors strongly influence buyer behaviour (factors are ordered by weighted mean of marks) -- quality, design, price and warranty. Marking product as EAP has a neutral influence. The factor "advertising" has the weakest influence. As for "wood as building material" there is a strongest influence of the "product quality and price", the strong influence of "warranty, availability and other consumers recommendations". The other factors have neutral influence.

Respondent were shown 6 different eco-labels and certification logos (Q9) and asked which of them they have already seen on any products (table X).

Table 6. Answers to Q9

| | Organic product I (SK) | Organic product II (SK) | EU flower | EAP (SK) | FSC | PEFC |
|-----------|------------------------|-------------------------|-----------|----------|--------|--------|
| frequency | 88 | 526 | 150 | 261 | 124 | 144 |
| percent | 12.14% | 72.55% | 20.69% | 36.00% | 17.10% | 19.86% |

More than 64 % respondents have already noticed logos used for labelling of organic agricultural production. National environmental label for EAP has been noticed 36 % of respondents. There is a little awareness of logos of forest certification schemes.

4. CONCLUSION

The main aim of this research was to reveal the end-users awareness of environmentally appropriate products with the emphasis on the perception of wood products attributes in Slovakia. Generally, some 68% of respondents think that wood is environmentally more friendly than other materials and over 70% of respondents would buy products if they knew that these products are environmentally appropriate. Respondents also have a good understanding of the differences between EAPs and common products mainly in connection with the potential of these products to eliminate negative impacts on the environment. Over 55% of respondents would purchase EAPs if they knew that they contribute to the maintenance of natural resources for their descendants. The understanding of sustainable forest management is linked to the effort to maintain forest stands in good health conditions and appropriate biological diversity in order to tackle the global warming. The respondents incline to maintain the forests as a heritage and a tool for the next generations. In spite of this, their awareness of the logos of the main forest certification is weak. These facts should be emphasised in promotion of natural resources and sustainable forest management. It is obvious that people can perceive the importance of society efforts as well as a potential negative influence of any crisis in direct connection with themselves and their families. More than 46% of respondents are convinced that agricultural products, wooden furniture, wooden buildings, household and sanitary paper products, and office paper as environmentally appropriate. These results indicate that respondents link wood and wood products directly to the environment.

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SELF-EVALUATION AS AN IMPORTANT TOOL OF PERSISTING ENHANCEMENT OF QUALITY AT UNIVERSITIES

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ABSTRACT:

This paper is dealing with problem of using CAF model – THE COMMON ASSESSMENT FRAMEWORK as an important tool of self-evaluation of quality in sector of administration of state and public. This model is applied in condition of The Technical University in Zvolen, there are selected two valuation criterias – employees and results bearing on employees.

Key words: managing of quality, CAF model, self – evaluation, criteria, results

1. MANAGERING OF QUALITY

In term of managing of quality is primarily desirable to know university as subject, which effects at the market of educational and experimental services. There are these following characters of university:

- university is the organization, respectively enterprise, which provides services
- university as an enterprise of services provides essential services in the form of: higher education, scientific research, respectively. artistic activity. But university may also carry out business activities, from which it benefits.
- higher education is a three-level study (Bachelor's degree, master's degree, engineering, post-graduate study, doctoral study).

In relation to quality is essential primarily to know and identify customers of university, identify and define their requirements and forecast trends in these requirements. The aim is a satisfied and loyal customers, see Fig. 1.

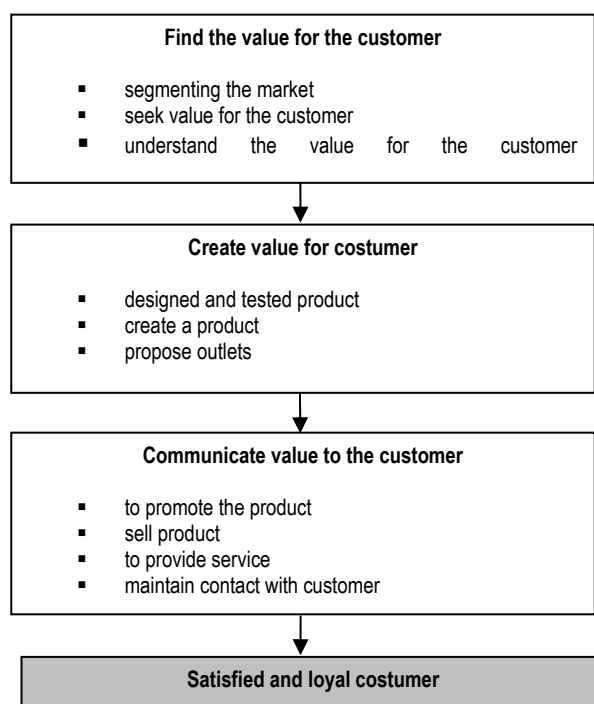


Figure 1: Managing of quality in terms of university

In this context, the university has in fact more groups of costumers, who use its services and have benefit from them. In a broader sense can be distinguish two groups of costumers:

- "stakeholders" interested parties* - the external environment of high school - state and public administration, population, economic and social practices, national and global institutions,
- Players, direct participants in research and training activities* - the internal environment of high school - teachers and researchers, doctoral students, candidates for study, graduates, other university staff, partner and cooperating educational, research and other institutions.

Importance of the university of customers shows that quality can be determined as the difference between their perceptions of the actual characteristics and expectations that have.

2. EVALUATION OF QUALITY OF THE UNIVERSITY

The university must constantly monitor and evaluate quality of provided services. The basis is the identification of performance and satisfaction. Performance is the ratio between the planning and carrying out quality. Relationship between the expected quality and perceived quality can be expressed in terms of satisfaction. Finding the current state of quality and its assessment is the basis for further improvement. Example of an evaluation system of quality universities is shown in Fig. 2.

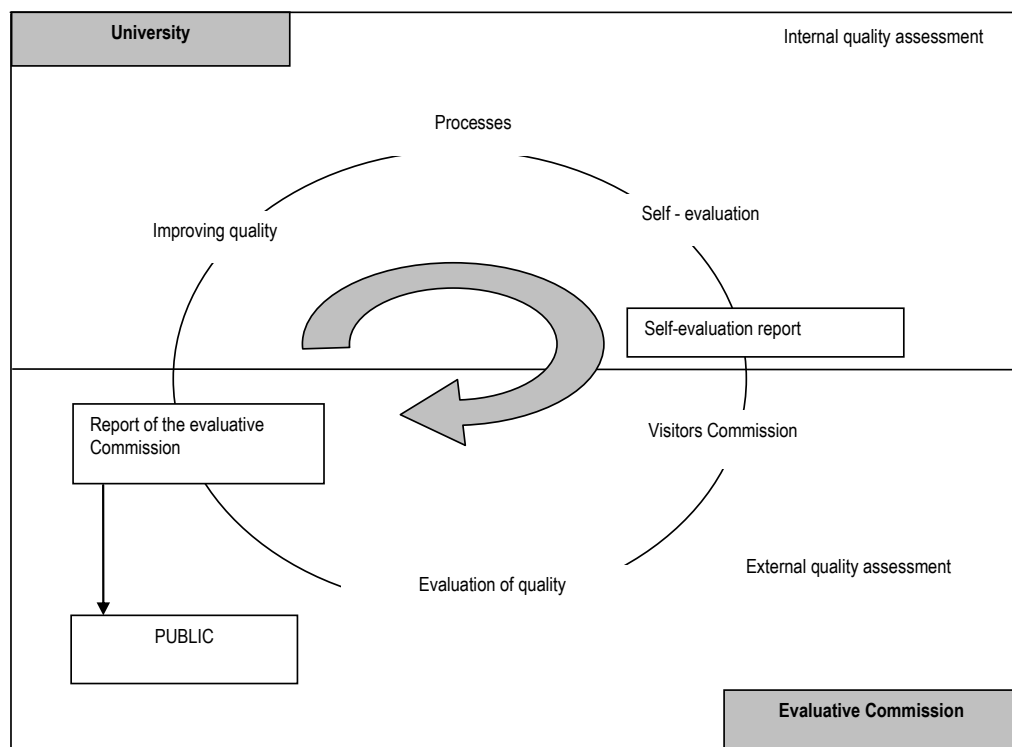


Figure 2: Quality assurance system at the university

In general, therefore, we can talk about three basic approaches to quality assessment:

- assessing the quality of external organizations (or external quality assessment),
- self – evaluation by university (or internal quality assessment),
- combination of external and internal quality assessment.

External quality assessment, for example, accreditation (Slovak Ministry of Education Slovak Republic), various certificates according to international standards (European EN ISO 9000) or ranking and rating of universities.

Self – evaluation by university can be implemented for example using the EFQM excellence model and the CAF model (The Common Assessment Framework).

Detection and evaluation of the quality of university training in science and research, or artistic activities for the university in most industrialized countries established laws governing the operation of universities. This level of evaluation must be conducted for the whole university as well as at the level of individual faculties, and is part of the annual report on the activities of the university.

The problem is often not the obligation to carry out the assessment, but the fact that they are not set accurate benchmarks for action by universities. Therefore, it is perceived only as a set of statistics - the number of courses and disciplines, the number of accepted students, the number of students in each class, the number of graduates, participants in scientific conferences, publications of educators, etc.

3. CAF MODEL

CAF (The Common Assessment Framework), respectively common system of quality assessment is a tool for self-evaluation of the public sector, tailored to their characteristics and specificities. Therefore this model seems particularly suitable for universities, respectively for public universities. It presents a comprehensive model of quality management.

The CAF model allows the university to achieve the following objectives:

- Establish comprehensive quality management principles, methodically lead the university in understanding self-evaluation in the transition from a system of planning and execution of fully integrated PDCA cycle.
- Promote self – evaluation of university in order to obtain a structured picture of the university and then suggestions for improvement activities.
- Act as a bridge to different models used in quality management.
- Promote bench learning of university (learning from the best).

The very structure of CAF model is based on the assumption that the university achieves exceptional results in performance in relation to customers, employees and company on the basis of leadership, strategy and planning of employees, partnerships and processes. It provides insight into the university at different angles simultaneously and analyze the holistic performance of an organization, see Fig.3 CAF model.

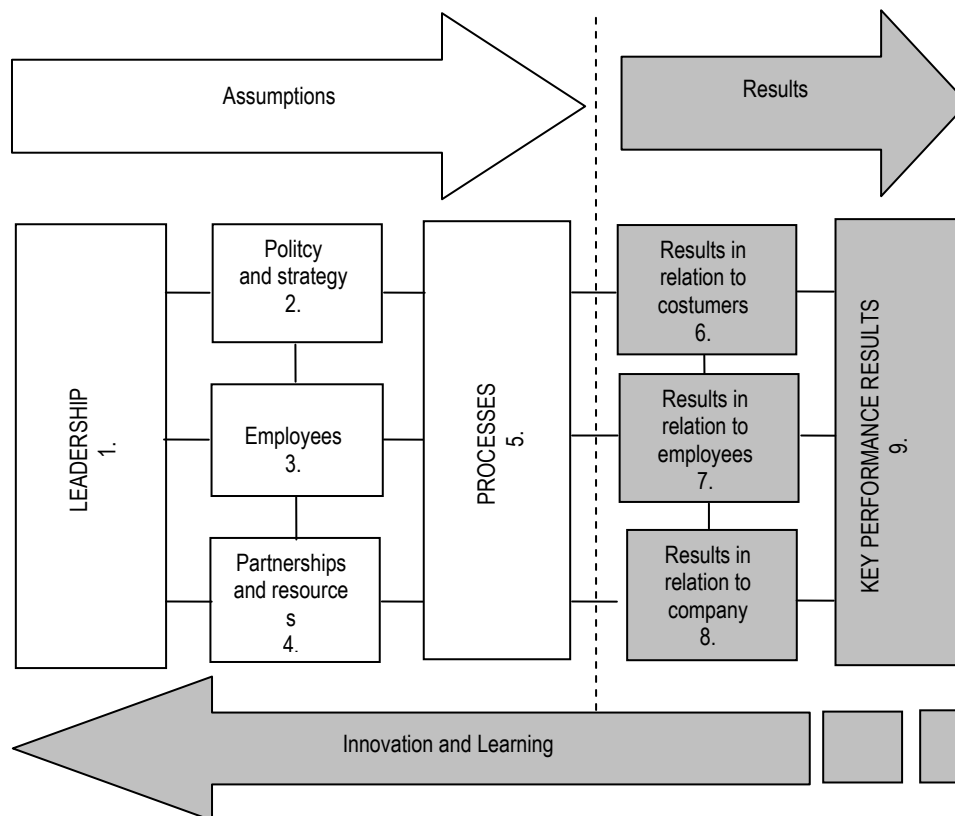


Figure 3: CAF model

Criteria assumptions (1. - 5.) determine what makes a university such as access to the tasks that lead to achieving the desired results. The right side of the image indicates the evaluation results (6. - 9.). The delivery criteria measured perceptions of what the employees, customers and society think about the university.

One of the compulsory elements of the CAF model is a score. Although the most important output of self-evaluation is the strengths and areas for improvement, the results are starting points, Table 1, 2.

Scores made on the basis of PDCA cycle (Plan, Do, Check and Act):

- The evaluation panel assumptions more emphasis on their own course of PDCA cycle and progress is expressed as a spiral, where each turn cycle can occur at the stage of improvement: Plan, Do, Check and Act.
- Bench learning activities are normally taken into consideration at the highest level of all these phases.
- This method of scoring provides more information on those areas where improvement is needed most.
- Panel evaluation of the results shows that it is necessary to ensure that the earlier trend of acceleration, or to focus on achieving the objectives.

Table 1: Evaluation of anticipated criteria

| Level | Scale | 0-10 | 11-30 | 31-50 | 51-70 | 71-90 | 91-100 |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------|------|-------|-------|-------|-------|--------|
| PLAN | Planning is based on the needs and expectations of stakeholders. Planning is regularly expanding in all parts of the organization. | | | | | | |
| DO | Implementation is managed through defined processes and responsibilities and is regularly distributed through all the relevant sections. | | | | | | |
| CHECK | Defined processes are monitored with the assistance of relevant indicators, and are regularly reviewed in all relevant areas of the organization. | | | | | | |
| ACT | Corrective and improvement actions are implemented in response to the results of a control in all relevant parts of the organization. | | | | | | |

Table 2: Evaluation criteria results

| Advanced evaluation of results | | | | | | |
|--------------------------------|--------------------------|---------------------------------------|-------------------------------------|------------------------------------|------------------------------------|-------------------------------------------------------|
| Scale | 0-10 | 11-30 | 31-50 | 51-70 | 71-90 | 91-100 |
| TRENDS | No measure | Negative trend | Stagnant trend or moderate progress | Permanent progress | Dominant progress | Positive results compared with relevant organizations |
| OBJECTIVES | No or casual information | Results do not met defined objectives | Several defined objectives are met | Some of defined objectives are met | Most of defined objectives are met | All defined objectives are met |
| Score valuation | | | | | | |

4. SELF-EVALUATION OF SELECTED UNIVERSITY ACCORDING TO CAF MODEL

The evaluation process based on the methodology of the system of quality assessment 2006 (Common Assessment Framework - CAF model) is in two parts. The first part was processed CAF team public high schools on the basis of self-report methodology model CAF together with a numerical evaluation by the evaluation panels. This report was submitted to the Slovak society for quality assessment.

In the second part of a team of reviewers assessed the organization on the spot. The purpose of the visit to the site is to verify and confirm the results of self-governance, to clarify ambiguous points in the report and determine the atmosphere in the workplace. Judging on the spot, the team of other reviewers as those in the organization previously served as advisers in compiling the self-administration.

Self-evaluation report includes an overall look at the criteria and detailed comments for each sub-criteria with the strengths and areas for improvement in terms of criteria CAF 2006 model, as well

as numerical evaluation by assessment panels (see table 1, 2). Resulted valuation is in the following table 3.

The orientation is an overall assessment of the two criteria, namely the predicted criterion 3: Management of human resources and delivery criterion 7: Results with respect to the employees.

In the introductory part of each criterion are listed strengths and areas for improvement. Authors of self-valuation report have created a very good basis for a draft Action plan for improvement.

Virtually all the examples of concrete sub-criteria have been listed links and evidence, which help the assessment process.

Table 3: Result valuation

| Criteria | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|--------------------|----|----|-----------|----|----|----|-----------|----|----|
| Overall evaluation | 31 | 44 | 34 | 39 | 31 | 26 | 28 | 46 | 39 |

Overall evaluation criteria 3 – Human resources management (HRM)

As an organization manages, develops and uses knowledge and full potential of their employees on individual, team-based and full-organization levels and how these activities are planned to support its policy and strategy and effective work of their employees.

Strengths

- Planning for human resources is based on Development plan of the university, planning education, training and retraining of teaching and research staff.
- The existence of the reconstruction of universities, which fills the role of ensuring appropriate working conditions for employees.
- Special conditions for employees in the resolution of wage compensation for sick leave embedded in the Collective agreement.
- The intention to increase the proportion of teachers with academic qualifications supported offering courses in collaboration with another university.
- Using methods of working groups (brainstorming) for gathering ideas and suggestions for solving current problems.
- Access to care for the needs of the socially disadvantaged people with disabilities through the creation of adequate conditions for their movement in the organization (wheelchair access).
- Extent of support from universities for external mobility of teachers.

Areas for improvement

- Consider processing a separate document for the strategy and policy management of human resources.
- Establish and regularly use the tools of the satisfaction survey of employees to better understand the requirements of employees and to obtain feedback on the implemented measures.
- Implement a unified and transparent system of remuneration of staff to improve support for employees in managerial positions and their motivation in performing the tasks and objectives of the organization.
- Establish mechanisms for the active involvement of employees and their representatives in the formulation of plans, strategies and objectives, designing processes and in the identification and implementation of innovative activities.

Overall evaluation criteria 7 – Results in relation to employees

Results are achieved by the organization in relation to its employees.

Strengths

- Openness to change, which tends to rationality and efficiency in all aspects of the university activities.
- Level of education ability of staff from the university, including the obligation of teaching staff to attend educational minimum.
- The existence of non-cash compensation of employees (rehabilitation stays, etc.).

Areas for improvement

- Consider the establishment, respectively review of indicators relating to the relationship with employees and employee performance.
- Assess the appropriateness of implementing all the staff satisfaction survey using the questionnaire (in line with the model in the CAF), the regular statistical evaluation.
- Consider how to compare the results achieved in relation to employees across the faculties - internal benchmarking.
- Implement a system to evaluate the effectiveness of educational activities for the staff and the efficiency of resources for education.
- Implement a unified and transparent system of remuneration of staff to improve support for employees and their motivation in the tasks of achieving the objectives of the organization and active involvement in the innovation organization.
- Through staff satisfaction survey to identify the degree of their satisfaction with the culture of the organization with access to social issues if their method of improvement.
- Establish a regular assessment of the suitability of the indicators used for the performance of employees.

5. COMPARISON OF EVALUATION ACCORDING TO ISO 9000 AND SELF-EVALUATION BY CAF MODEL

The CAF model is a dynamic model, which focuses on the growth of universities, for it creates area for improvement and integrates the various elements of governance itself. However, ISO 9001 is a static model, which is based on achieving compliance with the standards and focuses on the processes and procedures of the university. CAF and ISO are not necessarily mutually exclusive, complementary to the adjacent to each other. Other significant differences in the two models are listed in table 4.

Table 4: Comparison of audit and self-evaluation

| Audit (certification by ISO 9000) | Self-evaluation by CAF model, resp. EFQM |
|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| The detection of disagreement of system character, failure to procedures and guidelines | Determination of strengths and weaknesses, the weaknesses are seen as an incentive to improve |
| The aim is to find a disagreement (can be discouragingly) | The aim is to achieve further improvements (have to be challenging) |
| Usually performed by the specialist | Usually implemented independently of each other, can help the expert |
| The duration of a few days | The duration of several weeks to months |
| Control of implementation of standards, regulations, guidelines, procedures | Comparison with the draft, respectively patterns of activity involving the university |

CONCLUSION

Introduction of CAF model as an evaluation system of quality management in the Slovak Republic contributes to the reform and improving performance across government. At the same time it is the sign of the dynamic development of the country overall. Experience with the application of CAF model for the selected university shows that the identification of strengths and weaknesses as well as scores of individual criteria and assumptions sub-criteria and the results will serve to further improving the performance of the organization.

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Chapter 4.

MANAGEMENT AND INNOVATION

MANAGER ACTIVITIES AS A BASIS OF THE COMPANY COMPETITION

Violeta Efremovska, Živka Meloska

ABSTRACT

The condition of the economy in global as well as in the wood industry at one country, does not depend only of the political terms, but it depends of the managers-entrepreneur actions too.

The state can make a promotion of the competition capability of a country by different measurements. But these measurements are not going to multiply if there is not going to be any initiative or a support by managers.

The market existence battle, especially in the terms of globalization, has changed the manager relations. They should stay at the market by base analysis and high level of flexibility, innovations and fight to their competition.

Key words: managers, competition, companies

INTRODUCTION

We can not talk about development of a country, or development of economy, if there is not a competition capability there. The competition capability of one economy action can be seen by the capability of production and distribution of products that will be accepted at the market. The market is a measure of the competition capability of each economy part.

The state macro politics is of a big influence at the economy competition capability. This state macropolitic by declaring the law regulations (taxes, incomes, subventions, customer regulations) directly effects the economic and financial actions at the economy subjects in the state. As a result of these it is normal that with the fight for competition capability the company manager teams are of a large influence. They, with their high quality knowledge and appropriateness and by the implementation of high quality acceptable principles of managing, should handle the norms regulated by the state as well as the competition challenges. There are a lot of examples where the competition between the competitors: decrease of prices, new products, increase of quality, implementation to new market. The companies for increase of the competition capability, in the struggle of market survival, need to invest in human capital, or to make quality manager team and leaders that can handle the competition.

2. CHARACTERISTICS OF MANAGERS

In terms of market globalization, when the world becomes one large market of offer and requests, the companies existence becomes harder and harder. In terms where there are large and quick changes in the surrounding, when there is a big produce competition at the markets, a lot of knowledge and wisdoms are needed for survivor and effective competition in the domestic country and out at one wide global market.

In these terms the company management has the biggest responsibility of the success and failure of the company, or the position of one commerce part at one state.

Globally orientated managers can see the surround changes, they are changing and adjusting to the same. Managers are flexible, quick learners, reacting to every market change and the customer needs. They are motivating and creating positive atmosphere in the company, they are implementing

their own knowledge and the knowledge of the employed. Good managers are not orientieered to their own interest, but to the company interests in global.

Main manager task is recognition of the business changes at the surrounding, to chouse markets with aim and to adjust to the cultural and other differences of the chosen markets.

Managers should have entrepreneur capabilities.

Innovation is one of the basic characteristics of the entrepreneur. They could find out new markets, new technologies, new products, new energy resources, new organization stricture, new raw materials, and new methods of business.

Other main entrepreneur characteristic of a good manager is taking risks. The business move of the manager- entrepreneur is new insecurity uncertain that are giving the risks during work. The incomes and the success can not be predicted for sure. It can be seen visionary. In some risk situations the manager gives decisions that are in fact "uncertain deal" in doing business. The entrepreneur is the person that takes the risks.

Third main characteristic of the entrepreneur - managers is independence and action. It makes him act as an independent initiator of the controlled company changes. The changes in the company are made at his own thoughts about the surrounding changes and the strategic development of the company, or the vision for the furdur activities of the company.

Because of this some inter analysis are needed to be done, about the work of the company and some external analysis about the surrounding activities.

The internal analysis are about the potential of the company: working force, terms of work, temperature, moisture, noise, ventilation, light, wooden dust, machines and tools, used materials, working actions. Here the meaning of the point of the employed to the working and the relation of the bosses to the employments can be counted as well.

The external analysis are pointed to the company surrounding outside its margins. It can be separately or in general. The separate surrounding needs analyze of the costumers, offer of labor, suppliers, and competition. The surrounding in general means all the other factors that are effecting the work should be analyzed, not only the action of the company were they are employed, but in the economy in total. They are of different types and are related to: political-law surrounding, technological, social-cultural, international, and economic.

3. IMPORTANT MANAGER ACTIVITIES

The activities taken by the managers can slow down the development of the company or to help with its increase in total.

For taking over of some entrepreneur activities that are orienteer on increase of the competition capability of the company, it is needed the managers to use some specified methods. The best is SWOT-analyze that is very flexible and can connect the results from the surrounding analysis with the company analysis. These analysis are in fact analysis of advantage strength, weaknesses, opportunities and treats. These analysis determinate the own weaknesses and treats from the surrounding, as a well as their own advantages and capabilities that are to be used. This analyze serve for determination of the development strategy of the company.

The good entrepreneurs, during define of the development strategy of the company should take attention at: is there any appearance of new market competition, is there any competition between the new competition, and is there any infiltration of some new supstituiered market products, the power of the buyers and the suppliers.

After the analyze of the surrounding and the analyze of the company itself, a strategy that should make the existence at the market reality and a long-term success of the company. During realization of this a different alterdomestics and variabilites should be made. They should not be different in details, but in the basic approach. One approach in the cause of the strategy is making a

concept about are there going to be new products or actual products, or new markets or the already existing markets. Here are some variabilities with the already existing products, are they going to be sent to the existing or new markets, or the existing or new markets should be given some new products.

Another concept in the choice of strategy is competition strategy. This strategy can be orienteer at the lowest expenses, or offer of already known or unique products by design, use of the product, commercial, distribution canals or conception of determinate field of activities.

For reaching of the competition capabilities of the company, managers should be orienteer globally and should make attention of the surrounding.

4. CONCLUSIONS

Managers are people that have the company destiny in their hands, or people that are working at this company. They have responsibility as in front of them as a well as in front of the state.

In terms of global market, were the competition is lower, and there are some quick changes in the surrounding, the company existence is uncertain all the time.

The good and successful managers should have entrepreneur capabilities and high values.

Implementation of flexible production, production innovation, focus at the consumers and the other market participants, low expenses, quality products, following of the consumers and the needs of the market, are some of the activities needed to be possessed by the company managers.

In new terms of economy, were there are some dynamic surrounding, the manager is being expected to define a strategy for development that is going to be the base for existence and concurrence at the market and all of that based at some basic analysis at the key factors.

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PERCEPTION OF CORPORATE IDENTITY IN WOOD PROCESSING AND FURNITURE MANUFACTURING

Kristina Bičanić, Denis Jelačić

Abstract

In this paper we researched how wood processing and furniture manufacturing companies in Republic of Croatia define the term «corporate identity», what makes it and what are the advantages of the same. Research was conducted as questionnaire survey which had 3 questions on a sample of 35 companies. Given data were analyzed statistically using computer software Statistica and Excell. Research results showed that the corporate identity was often associated with terms: visual presentation (design of the company), image and reputation, typical image, recognition and diversity on the market, external communication.

Key words: corporate identity, wood process and furniture manufacture

1. INTRODUCTION

Companies should have strong identity to be competitive on the market. There are three main areas which equate corporate identity with graphic design, with integrated corporate communication and with a multidisciplinary approach which draws heavily on organizational behaviour (van Riel, 1997).

Every organization is unique and the identity must spring from company's own roots, its personality, its strengths and its weaknesses. In globalization world, business interests in corporate identity have increased significantly in recent years. Companies have realised that a strong identity can help them align with the marketplace, attract investment, motivate employees and serve as a means to differentiate their products and services. Identity is now recognised as an effective strategic instrument and means to achieve advantages over the competition.

2. RESEARCH METHOD

To achieve better results of research survey method was chosen (Matova, 2007). The questionnaire consisted of six questions related to general information about the company and three questions related to the identity of the company, or understanding of corporate identity in wood processing and furniture manufacturing companies. We surveyed 210 companies for wood processing and furniture manufacturing and 35 (16,67%) answered the questions. Questionare was formed as follows:

Corporate identity questionnaire

Introductory questions about general information about the company.

1. *How would you define the term "Corporate identity" in your own words? (multiple choice)*
2. *What do you think makes corporate identity? (multiple choice)*
3. *What are the main benefits of corporate identity for the company (in your opinion)?*

After gathering data through survey questionnaire, collected data were analysed using computer software Excell and Statistica. For establishing dependence between answers from the survey we used χ^2 test. Equation to calculate χ^2 value was:

$$\chi^2 = \sum \frac{(f_o - f_e)^2}{f_e}$$

where f_o means number of observed frequencies, and f_e means number of expected (theoretical) frequencies.

Expected frequencies (f_e) was computed by equation:

$$f_e = \frac{R_{fo} \times S_{fo}}{N},$$

where R_{fo} means number of observed frequencies per row, and S_{fo} means number of observed frequencies per column, while N denotes total number of observed frequencies.

Hypothesis H_0 was: „There is no significant difference between particular answers from the survey“. Null-hypothesis was tested at level of statistical dependence 5% ($p=0,05$), i.e. if $p>0,05$ H_0 was accepted and if $p<0,05$ H_0 was rejected.

Degrees of freedom (df) was computed by equation:

$$df = (\text{total number of rows} - 1) * (\text{total number of columns} - 1).$$

3. RESULTS

Introduction questions from the questionnaire referred to general information about the company. The questionnaire was answered by 28,57% mikro firms (1-10 employees), 31,43% small (11-50 employees), 22,86% medium (51-250 employees) and 17,14% of large companies (over 250 employees). In respect of questions relating to legal form of companies, only 3 companies are joint stock companies, while all the rest are society with limited liability.

First question was "How would you define the term "Corporate identity" in your own words (Figure 1), the largest percentage of respondents (88,57%) defined the term as visual presentation of the company, smaller percentage of respondents as the image of the company (65,71%), typical image, recognition and diversity on the market (62,86%), while the smallest percentage of the companies described the term "corporate identity" as existence of ecological and social awareness of the company (8,57%), loyalty of employees, their commitment - involvement to the company (5,71%).

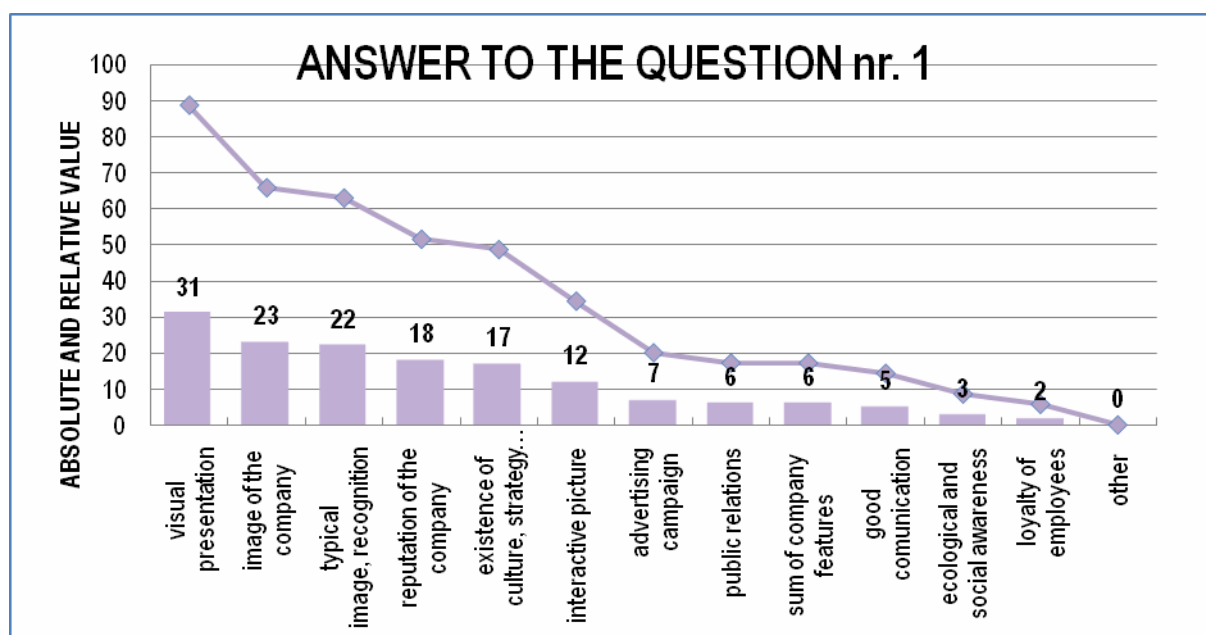


Figure 1. How would you describe the term Corporate identity

Second question was "What do you think makes corporate identity?". The largest number of respondents, 30 of them (85.71%) responded that corporate identity is made by design of the company. Twenty two respondents (62.86%) consider that the corporate identity consists of external communication, seventeen think it's philosophy of the company, and an equal number of respondents (16), believes that corporate identity is made by the company vision and values that the company publishes, and which holds.

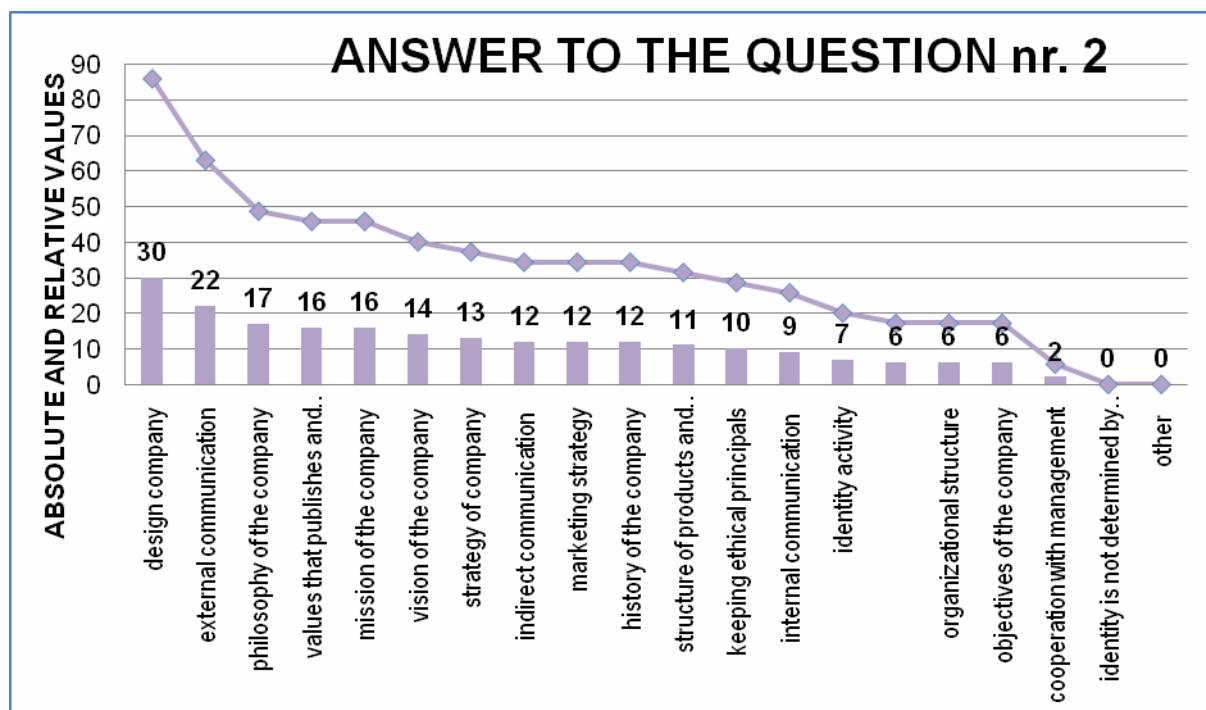


Figure 2. What do you think makes corporate identity

"What are the main benefits of corporate identity for the company?", was the last question. The largest number of respondents, (31) responded that the main benefits for company are recognition on the market and creation of image and reputation (29 respondents). Part of the respondents answered that the advantage for the company is also the support of a position on the market (23 respondents), uniformity of visual identity (21 respondents) and the motivation of employees, their identification with the company and satisfaction of employees (16 respondents).

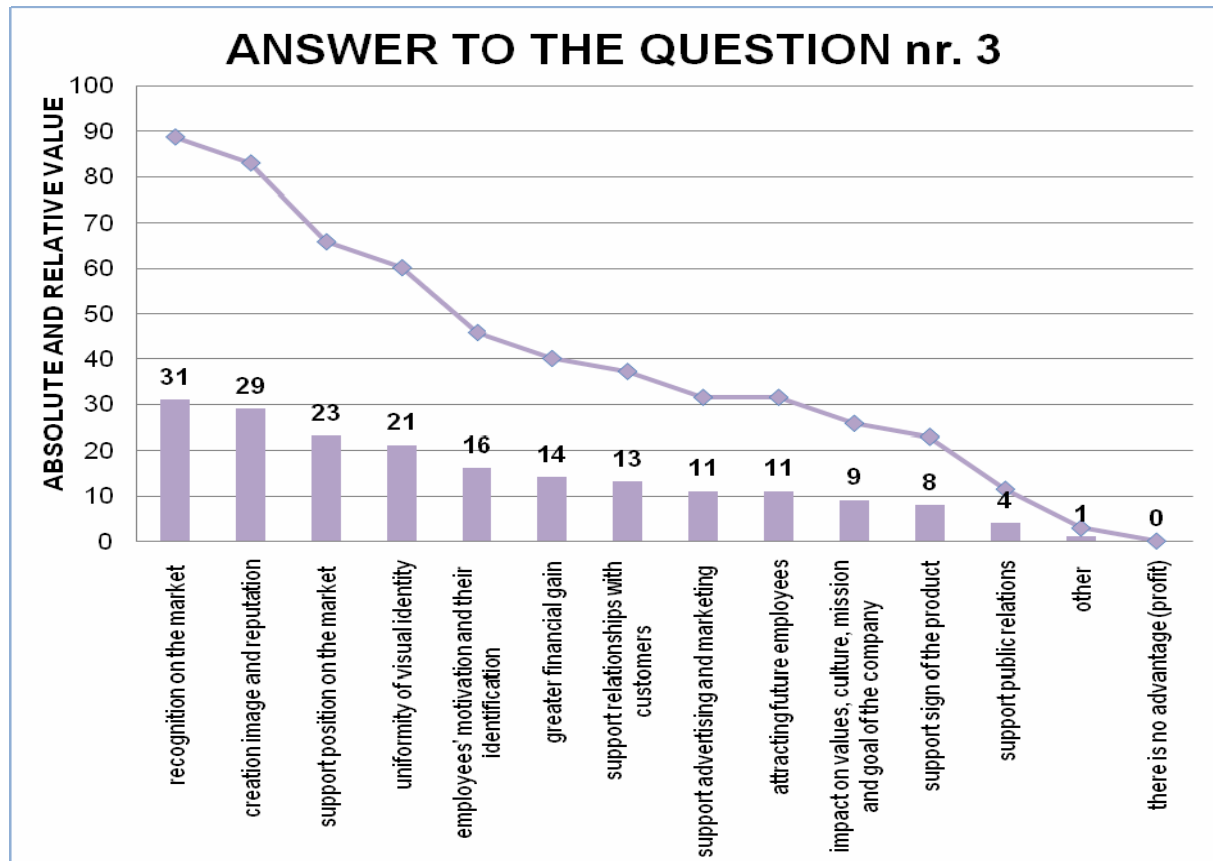


Figure 3. What are the main benefits for companies with corporate identity

Using the χ^2 test, we compared the response to the first question that the term "corporate identity" is defined as image of the company and the answer to the third question that the main benefits from corporate identity is creation of image and reputation. Test showed that there was no significant difference between these two answers, so we can deduce that the answer to definition of corporate identity significantly affect the answer two that the main benefits for company is creating image and reputation of the company.

Table 1 shows that 57.14% of those who define the term of corporate identity through the image of the company, believes that creating the image and reputation is the profit for the company. There is only 8.57% companies which are not defining the corporate identity through image, and which also considered that the image doesn't create results in the market.

Table 1. Comparison of answers to question 1 and 3

| image (1) | creation of image and reputation (3) | | | Row Totals |
|----------------|--------------------------------------|--------|--------|------------|
| | | no | yes | |
| Count | no | 3 | 9 | 12 |
| Column Percent | | 50,00% | 31,03% | |
| Row Percent | | 25,00% | 75,00% | |
| Total Percent | | 8,57% | 25,71% | 34,29% |
| Count | yes | 3 | 20 | 23 |
| Column Percent | | 50,00% | 68,97% | |
| Row Percent | | 13,04% | 86,96% | |
| Total Percent | | 8,57% | 57,14% | 65,71% |
| Count | All Grps | 6 | 29 | 35 |
| Total Percent | | 17,14% | 82,86% | |

$$\chi^2 = 0,79, p = 0,373, df = 1$$

Comparing the answers 2 and 3, we have found that there are no significant differences between the responses that identity consist of ethical norms and responses that the profit for the company makes employees' motivation and their identification with the company. Only 17.14% of respondents claim that identity consist of ethical standards of the company, and also believe that they represent a profit for the company. Larger part of the companies (42.86% of them) doesn't think that consistence of identity means existence of ethical norms in the company and believes that profits for the company doesn't represent employees' motivation, their identification with the company and their satisfaction. Only 11.43% respondents see corporate identity through existence of ethical norms, but doesn't see the benefit for the company in the motivation and identification of employees. Keeping up to ethical standards in business and the satisfaction of the employees are very important for the company.

Table 3. Comparison of answers to question 2 and 3.

| ethical principals(2) | employees' motivation (3) | | | Row Totals |
|-----------------------|---------------------------|--------|--------|------------|
| | | no | yes | |
| Count | no | 15 | 10 | 25 |
| Column Percent | | 78,95% | 62,50% | |
| Row Percent | | 60,00% | 40,00% | |
| Total Percent | | 42,86% | 28,57% | 71,43% |
| Count | yes | 4 | 6 | 10 |
| Column Percent | | 21,05% | 37,50% | |
| Row Percent | | 40,00% | 60,00% | |
| Total Percent | | 11,43% | 17,14% | 28,57% |
| Count | All Grps | 19 | 16 | 35 |
| Total Percent | | 54,29% | 45,71% | |

$$\chi^2 = 1,151, p = 0,283, df = 1$$

Employees' motivation, commitment, their satisfaction result with the satisfaction of consumers. Strong identity can be achieved if employees show their satisfaction in work, when consumers see the sincere concern for their needs. Trust, respecting needs, empathy are characteristics that are now required among enterprises. Business ethics in many cases can help in the construction of identity.

4. CONCLUSION

Every business entity interaction with the environment is a reflection of the perception of his identity, and thus everything that a company must be for the purpose of affirmation of his identity. Identity is recognized as a strategic instrument, and it means to achieve advantages over competitors. The research conducted in Croatian companies for wood processing and furniture production showed that most companies devoted the majority of attention to the visual presentation and image.

Companies must understand that identity is not just a slogan or a collection of phrases, it is visible, tangible and comprehensive. The realization of corporate identity can be reached by constant activity in its establishment.

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CORPORATE IDENTITY IN THE CONDITIONS OF THE SLOVAK WOOD PROCESSING INDUSTRY

Hana Maťová

ABSTRACT

This paper deals with corporate identity and its perception and understanding by wood processing companies in Slovakia. The aim of our survey was to reveal and verify our premises about perception and understanding the term corporate identity.

Key words: corporate identity, wood processing industry

1. CORPORATE IDENTITY

There are many different definitions and interpretations of corporate identity. The International Corporate Identity Group (ICIG) made a statement of corporate identity instead of a definition:

The Strathclyde Statement

Every organization has an identity. It articulates the corporate ethos, aims and values and presents a sense of individuality that can help to differentiate the organization within its competitive environment.

When well managed, corporate identity can be a powerful means of integrating the many disciplines and activities essential to an organization's success. It can also provide the visual cohesion necessary to ensure that all corporate communications are coherent with each other and result in an image consistent with the organization's defining ethos and character.

By effectively managing its corporate identity an organization can build understanding and commitment among its diverse stakeholders. This can be manifested in an ability to attract and retain customers and employees, achieve strategic alliances, gain the support of financial markets and generate a sense of direction and purpose. Corporate identity is a strategic issue.

Corporate identity differs from traditional brand marketing since it is concerned with all of an organization's stakeholders and the multi-faceted way in which an organization communicates (van Riel & Balmer, 1997, p. 355).

As for corporate identity components we agreed with Melewar and Karaosmanoglu (2006) that CI has many components such as: Corporate structure, Corporate strategy, Corporate culture, Corporate behavior, Corporate Design, Corporate Communication, Industry identity (external factor). Every mentioned component has some sub-items.

2. THE AIM OF THE STUDY

The main aim of our study was to investigate what organizations perceive as the "Corporate identity". The purpose of the study was to find out about: CI definitions, CI components, CI management, CI benefits, CI target audience among wood processing companies in Slovakia.

The premises of the study were: company identifies corporate identity with corporate design or corporate image, company perceives CI as a tool of marketing communication, company doesn't perceive employees as a target group for CI. We decided to carry out this study to verify this premises.

3. RESEARCH METHODS

To verify our premises we conducted survey during the year 2008. The questionnaire contained 10 questions related to corporate identity and questions about general company's information. Some questions are like the questions from Podnar's study (2005). 300 enterprises were contacted, from which 80 (26,60 %) answered questions, and 59 (19,67 %) were taken into consideration. Questionnaire contained close-ended and open-ended questions. Some questions were multiple-choice questions.

4. RESULTS

Here we present some results of our study.

Question 1 "Does your company have corporate identity?" Results are shown in the figure 1.

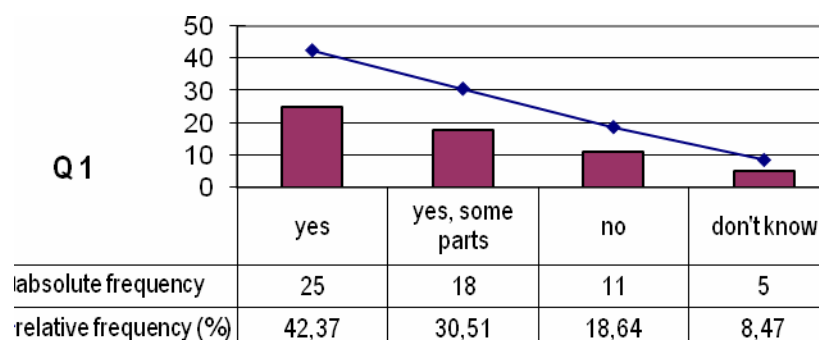


Figure 7. Answers to the question 1

More than 60 % of our sample claims that their company has the corporate identity or some parts of the identity.

Question 2 "Does your company have Corporate Identity manual in print or electronic version?" Results are shown in the figure 2.

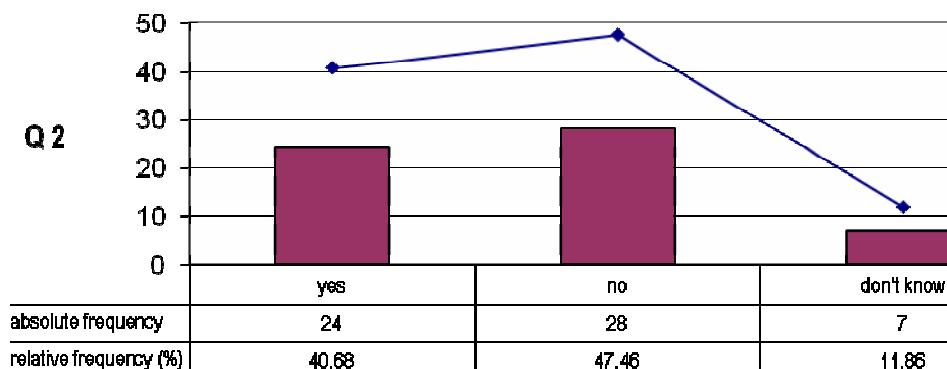


Figure 2. Answers to the question 2

After comparison of the results of the Q1 and Q2 and we discovered that the same 11 companies answered "no" in both questions.

Question 3 “Do you follow the Corporate Identity Manual in your company in full?”

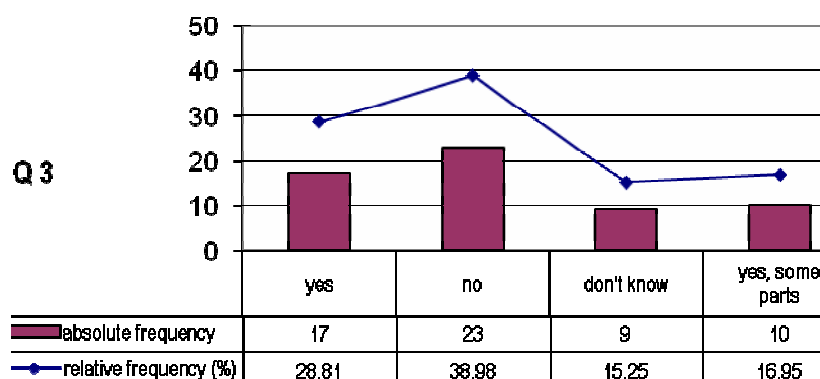


Figure 3. Answers to the question 3

More than 38 % of companies don't follow the corporate identity manual. We compared the answers to the Q1 and Q3 and we found out that 11 companies claim they don't have CI and also don't follow the manual.

Question 4 “How would you define „Corporate Identity” in your own words ?”

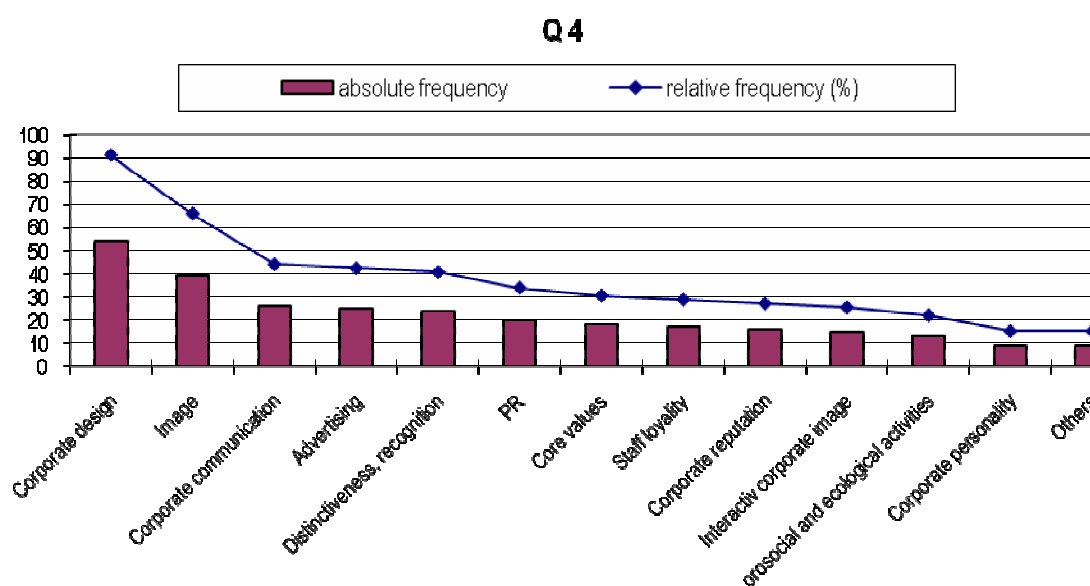


Figure 4. Answers to the question 4

More than 90 % of the companies understand corporate identity as a corporate design and more than 60 % companies understand corporate identity as a corporate image. The first five definitions are linked to tangible components or elements perceptible by the senses of the CI. The main target group for these companies is customers. We can say that, CI is mostly understood as a communication tool, as a presentation or a promotion of the company.

Question 5 “What are the components (elements) of the CI?”

Table 1. Answers to Q5

| elements | absolute frequency | relative frequency (%) |
|------------------------------|--------------------|------------------------|
| Corporate design | 50 | 84,75 |
| Marketing communication | 39 | 66,10 |
| Corporate philosophy | 30 | 50,85 |
| Marketing strategy | 27 | 45,76 |
| Corporate core values | 26 | 44,07 |
| Organizational communication | 25 | 42,37 |
| Corporate vision | 20 | 33,90 |
| Corporate strategy | 20 | 33,90 |
| Corporate mission | 18 | 30,51 |
| Management behaviour | 18 | 30,51 |
| Employee behaviour | 17 | 28,81 |
| History of the company | 17 | 28,81 |
| Ethic standards | 16 | 27,12 |
| Corporate goals | 16 | 27,12 |
| Indirect communication | 14 | 23,73 |
| Organizational structure | 9 | 15,25 |
| Brand structure | 9 | 15,25 |
| Industry Identity | 9 | 15,25 |
| Nothing | 3 | 5,08 |
| Others | 1 | 1,69 |

This question was designed as an indirect question. The main goal of this question was to reveal the most known and important elements of the CI and also to reveal “definition of the CI”. The companies again understood CI as a corporate design, marketing communication, but in these results we can see not only tangible components but also intangible components of the CI (Corporate philosophy, corporate core values). So we can say that, some managers may have problems to create “definitions” (Q4), that is why we can see the different results between the Q4 and Q5.

Question 7 “What are the benefits of Corporate identity for the company (in your opinion) ?”

Table 2. Answers to Q7

| Benefits of the CI | absolute frequency | relative frequency (%) |
|----------------------------------|--------------------|------------------------|
| Unity of visual presentation | 36 | 61,02 |
| Image and reputation formation | 36 | 61,02 |
| Recognition, Visibility | 34 | 57,63 |
| Market position support | 27 | 45,76 |
| Customer relation support | 27 | 45,76 |
| Staff motivation, identification | 26 | 44,07 |
| PR support | 24 | 40,68 |
| Marketing communication support | 21 | 35,59 |
| Financial efficiency | 20 | 33,90 |
| Brand support | 17 | 28,81 |
| Attracting new staff | 16 | 27,12 |
| Influence on corporate values | 14 | 23,73 |
| No benefits | 1 | 1,69 |
| Others | 0 | 0,00 |

Companies want many benefits of the corporate identity, they expect benefits which can't be achieved only by "corporate design and marketing communication". If they want to achieve these benefits they must admit that corporate identity is a multi-component term and not only the corporate design or corporate image or marketing communication.

Question 8 "Who is the target audience of the CI?"

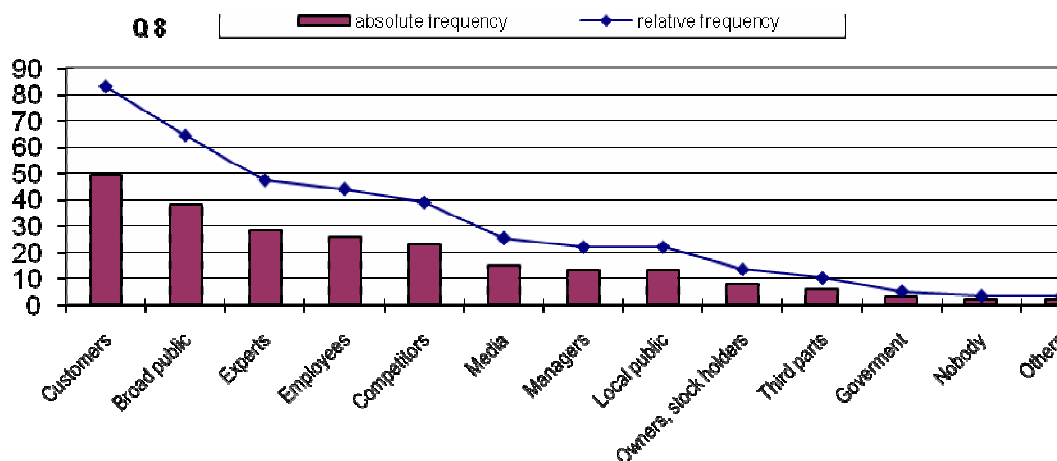


Figure 7. Answers to the Q8

As we assumed, the biggest group is „Customers”, with more than 80 %. The second target group for CI is General public. We think that this fact affirms previous results from other questions. Companies perceive the Corporate identity as the corporate design, corporate image and marketing communication that is why they consider customers and general public as target audience. More than 40 % companies consider experts as the third main target group for CI. This result was unexpected. We think that the reason of this result is the “need of respect” from the experts. The respect from the experts is more valuable than from the public.

5. CONCLUSION

The results of this study imply that we can support our premises. Wood processing companies in Slovakia perceive corporate identity as corporate design, corporate image. Companies perceive CI as a tool of marketing communication focused on customers. The employees are not perceived as the target audience of CI.

On the Slovak market we see corporate identity understood as a unitary visual style or as corporate image. This is the way CI is understood not only by businesses but also by agencies which are engaged in and offer services like revealing (creating, building) of CI, whereby the focus on visual style and communication (f. e. creating corporate design manual). The problem is their understanding and perception of the corporate identity. Unless they start to percept it as multi-component concept they will not be able to achieve the benefits carried by a well profiled corporate identity.

The traditional markets for wood products are saturated and the market opportunities are in Middle and Eastern Europe, China, Asia and Africa. There is a high probability that the other producing regions will concentrate their efforts to these markets. Competition will increase sustainability (Parobek, 2005).

Growing competition and sharper battle for the customer, for good business partners and overall positive corporate reputation, are going to bring the businesses to differentiate and use the identity as an instrument on the national and international markets.

The problem is their understanding and perception of identity. Unless they start to perceive it as multi-component concept they will not be able to achieve the benefits carried by a well profiled corporate identity.

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INFORMATION TECHNOLOGY DRIVEN SUPPLY CHAIN OPTIMIZATION IN THE WOOD PRODUCTS INDUSTRY

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ABSTRACT

For most companies in any industry, some degree of Information Technology (IT) adoption is necessary to conduct business. Examples include using email or having a website. Further, IT can be a powerful tool in developing efficiencies and lowering costs of doing business in supply chains. Relative to other industrial sectors, the forest products industry has been slow to adopt IT for supply chain management. IT applications can help to optimize wood products supply chains from the forest to the end consumer and create value for all participants.

Key words: Information Technology (IT), Supply Chains, Wood Products

1. INTRODUCTION

The forest products industry has historically been production oriented. Marketing and production are often viewed as corporate orientations or cultures. In a marketing orientation, organizations develop and maintain organizational objectives, skills and resources to adapt to changing market opportunities and conditions. Business success depends on effective analysis of marketing opportunities, researching and selecting target markets, designing marketing strategies, planning marketing programs, and organizing, implementing and controlling marketing efforts. A production orientation, on the other hand, concentrates on achieving high production efficiency to minimize costs and mass distribution. Under such a culture, organizations operate on the assumption that consumers prefer products that are widely available and inexpensive.

In addition, adding value to forest resources is typically preferred over production and marketing of commoditized wood products. Value-added wood products capture higher unit prices than raw logs, intermediate processed timber, or mass produced low quality products, and do so along a more diverse range of products. Value-added is the total value of all goods and services produced by the sector less the costs of all purchases from other sectors in the economy. Value-added is the surplus value from production that is distributed to investors and employees in the form of rents, profits and wages. Examples include furniture, flooring, molding, millwork, and doors.

Success in any industry is often based on technological efficiency-driven cost reduction. In the forest sector, one component of a value-added oriented wood manufacturing sector is the adoption of Information Technology (IT) in supply chains. Company performance measures can be improved through integrated IT connectivity between buyers and sellers in supply chains.

2. AN OVERVIEW OF INFORMATION TECHNOLOGY

2.1. What is IT?

The acronyms IT (information technology) or ICT (information and communication technology) have entered our everyday language in the last decade and tend to be used interchangeably. The Organisation for Economic Co-operation and Development (OECD) definition of ICT is endorsed by the

United Nations Statistical Office (UNSO). The OECD recognizes that the ICT sector should be defined as an industrial sector formed by bringing together business units (establishments, enterprises, or enterprise groups) that had common ICT activities. The OECD definition is based on the principles underlying the choice of the activities included in the ICT sector definition. For manufacturing industries, the products of a candidate industry: 1) Must be intended to fulfill the function of information processing and communication, including transmission and display; or 2) Must use electronic processing to detect, measure, and/or record physical phenomena or to control a physical process. For services industries, the products of a candidate industry must be intended to enable the function of information processing and communication by electronic means (Hetemäki and Nilsson 2005).

In essence, IT can be defined both from process and product perspectives. From the process perspective, IT is the technology required for information processing. From the product perspective, IT is the combined use of computers and equipment (i.e. hardware) and computer programs (i.e. software) to convert, store, protect, process, transmit, and retrieve information. In other words, IT can be viewed as an information system infrastructure.

An Information system (IS) is: 1. A system, whether automated or manual, that comprises people, machines, and/or methods organized to collect, process, transmit, and disseminate data that represent user information. 2. Any telecommunications and/or computer related equipment or interconnected system or subsystems of equipment that is used in the acquisition, storage, manipulation, management, movement, control, display, switching, interchange, transmission, or reception of voice and/or data, and includes software, firmware, and hardware. 3. The entire infrastructure, organization, personnel, and components for the collection, processing, storage, transmission, display, dissemination, and disposition of information (ATIS, 2005).

Thus, IICT integration has potential to reduce excess inventory and promote programs such as just-in-time delivery (JIT) and continuous replenishment (CRP) which rely on the sharing of scheduling, production, and shipment information between business partners (Vlosky et al. 2000). IICT also has the potential to improve market and customer knowledge through open and timely shared information, thus reducing the cost of market research (Anandarajan et al. 1998).

The Internet can facilitate promoting and selling products, promotion, advertising, and other business practices. Marketing on the Internet can afford companies, regardless of size or marketing expertise, the opportunity to promote their products regionally, nationally and internationally. From the smallest localized company to the largest multi-national corporation, the Internet can facilitate a myriad of business activities. The Internet can also potentially mediate small-business disadvantages by improving marketing and sales assistance in large, often sparsely populated areas.

The Internet can also increase efficiency and productivity. Examples are, communicating with foreign customers and suppliers, distributing sales information more swiftly and efficiently, speeding product development, and cutting costs of advertising to market services and products.

The term Inter-organizational Information and Communication technology (IICT) was coined by Kallioranta (2006) to capture the factors that influence successful IT/IS that spans organizations in a business-to-business (B2B) exchange relationship, i.e. is inter-organizational. IICT facilitates inter-organizational integration, collaboration, commerce, and communication in the exchange dyad.

Internet-supported IICT is typically called eBusiness, business processes, strategies, or technologies implemented to achieve virtual integration, collaboration, commerce, or communication (Vlosky 2002). Customer Relationship Management (CRM) and Enterprise Resource Planning (ERP) system implementation are additional applications that operationalize IT and complex systems. Overall, effective application of any information technology (IT) supports, shapes, and enables business strategies and value-chain activities. Although many organizations have successfully implemented Internet-based business, often IT investments do not meet corporate performance objectives, primarily due to non-technical reasons such as human and organizational aspects of IT implementation and management (Kallioranta 2006).

The potential impact of IICT on business operations can be approached through Porter's value chain. In 1985, Porter developed a widely cited value chain framework for companies to critically analyse their processes in order to gain competitive advantage. Porter identified a chain of activities that are common to a wide range of firms. The goal of these activities is to create an output that exceeds the cost of performing these activities. The primary activities defined by Porter (1985) are: Inbound Logistics: relationships with suppliers; activities required to receive, store, and disseminate inputs; Operations: activities required transforming inputs into outputs (products and services); Outbound Logistics: activities required to collect, store, and distribute the output; Marketing and Sales: activities to inform buyers about products and services; induce buyers to purchase them, and facilitate the purchase and; Service: activities required keeping the product or service working effectively for the buyer during and after it is sold and delivered. Secondary activities are: Procurement: acquisition of inputs or resources for the firm; Human Resource Management: activities involved in recruiting, hiring, training, developing, personnel; Technological Development: equipment, hardware, software, procedures and technical knowledge brought to bear in the firm's transformation of inputs into outputs and; Infrastructure: ties organization's various parts/departments together. **Table 1** summarizes inefficiencies and potential IICT contribution related to primary value chain activities. Secondary activities are omitted from the scope of this discussion.

Table 1. Value chain activities, inefficiencies, and IICT implementation impacts

| Value Chain Activity | Inefficiency | IICT impact |
|----------------------------------------------|-------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Inbound logistics & Procurement | Long lead time Incompatible IT systems Supplier selection | <ul style="list-style-type: none"> • Increased collaboration • Reduced order cycle • Reduced search cost • Enables JIT • More responsive supply • Small and frequent purchases |
| Production & Operations | Inaccurate demand forecast Bullwhip effect Excess inventory | <ul style="list-style-type: none"> • Sharing supply and demand information • Integration of timely and accurate data into planning • Better demand forecast • Reduced bullwhip effect • Reduced inventory |
| Outbound logistics & Distribution | Multiple middlemen Delivery costs | <ul style="list-style-type: none"> • Elimination of intermediaries • Electronic delivery • Accurate shipment • Improved availability of tracking information |
| Marketing & Sales | Costly and difficult market information attainment | <ul style="list-style-type: none"> • Improved market and customer information • Faster documentation process • Faster payment cycle • Lower communication costs • Improved relationship |
| Service (during & after) | Response time Costly customized information | <ul style="list-style-type: none"> • 24/7 information access • Faster response • Customized service at low cost |

Sources: Porter 1985; Anandarajan et al. 1998; Chan and Davis 2000; Ling and Yen 2001; Tan et al. 2000; Vlosky et al. 2000

3. SUPPLY CHAINS AND THE WOOD PRODUCTS INDUSTRY

3.1. Supply chains

Supply chains are composed of complex set of networks representing multiple organizations that often have conflicting objectives (Simchi-Levi et al. (2000). Supply chain management has the goal to integrate these networks of suppliers, manufacturing centers, distribution capacity and customers into a system improving operational efficiency and customer service. The objective is simple: the best performing supply chains are ones that best match supply, manufacturing and distribution to demand (Frayret et al. 2004).

While many companies struggle with the challenges of accessing good data and information integration, a number of industry leaders are optimizing their supply chains with both “inbound” and “outbound” information, increasing revenues and bottom-line cost efficiencies (Anonymous 2008).

“Aligning strategies such as sourcing, asset conversion and distribution is a critical component to the overall success of a company’s supply chain,” DK Sinha, General Manager of Manufacturing, Logistics and Retail at Cognizant, a leading provider of IT services” (Anonymous 2008).

The focus in supply chain management has shifted from engineering efficient manufacturing processes to the coordination of activities in supply chain networks through knowledge management” (Tan et al. 2000). Virtual integration allows for the incorporation of timely and accurate data into the company’s planning and control system (Vlosky et al. 2000). By sharing manufacturing schedules, production capacity information, and consumer demand information, companies are better able to coordinate and streamline production and value chain activities via improved demand forecasting (Tan et al. 2000).

3.2 Trends in the Wood Products Industry

1. Rapid changing market place
2. Fast development of new technologies
3. Fierce competition
4. Companies cannot compete with China and lower labor cost economies on cost alone.

To survive today, a wood products industry needs to strive to:

1. Lower costs
2. Increase quality
3. Shorten product development cycle
4. Tighten supply chain networks

3.3 IT-driven Optimization in Wood Products Supply Chains

Supply chains in the forest sector are unique due to time frames that are much longer than most businesses with rotations lengths of up to 100 years for boreal conifer species. This results uncertainties regarding the markets that these products will likely satisfy, but also the ability and the performance of the supply chain to satisfy these markets (Frayret et al. 2004).

Adoption of eBusiness/eCommerce in wood products has been slow and lags other industry sectors in the US (Kallioranta and Vlosky 2006). They ranked industry sectors from highest rates of adoption of to lowest as follows: In addition, larger companies tend to use higher order IT applications across wood products industry sectors for supply chain integration. Most manufacturers however, primarily use the IT and the Internet to gather business-related information on websites and communicate using email. In general, smaller manufacturers are not likely to use eBusiness technologies, often a reflection of a lack of formal business structures.

Poisson et al. (2003) suggest that significant benefits can be created by optimizing supply chains in the wood products industry (Figure 1).

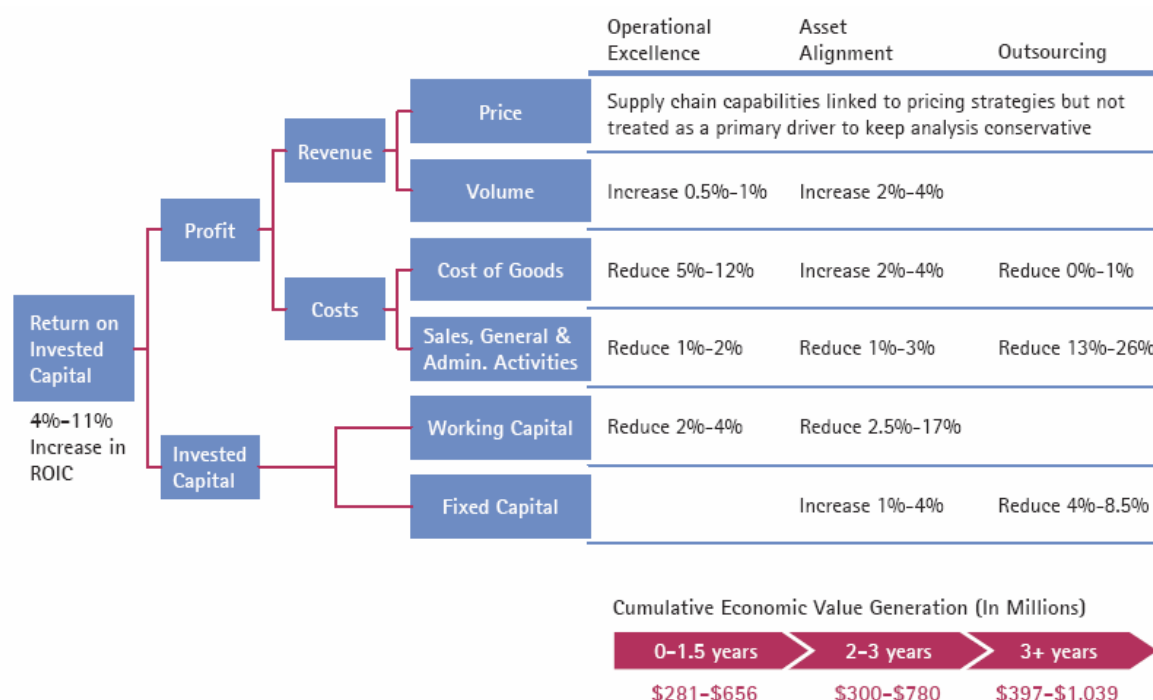


Figure 1. Five-year value-enhancement potential of transforming a hypothetical \$10 billion forest products company's supply chain. Additional value is realized as net operating profit, after amortization and taxes (NOPAT).

Source: Analysis of more than 80 forest products companies based on financial structure, industry benchmarks and Accenture experience. (Poisson et al. 2003)

4. SUMMARY

The IT revolution that started in the late twentieth century is causing fundamental transformations in the global forest sector and in global societies in general. There is a clear need for analytical evaluation of the impacts and opportunities for using IT for supply chain management and optimization at the company level and even at the country level.

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QUALIFICATION STRUCTURE IN SLOVENIAN WOOD INDUSTRY COMPANIES

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ABSTRACT

Contemporary business environment requires from companies flexibility and creativity, too, which are in close connection with employees. Human resources are the key holder of knowledge and ideas and therefore consequently of flexibility and creativity of the company, too. This is also true for wood-industry companies. The results of researches from the past few years imply, that the qualification structure of employed in wood-industry companies has changed to a certain extent, mostly on the account of more employees with higher levels of education. But the share of employees with less than vocational education is still (too) large, which is relatively unfavorable for assuring long-term success of Slovenian wood-industry companies.

Key words: qualification structure, wood-industry company

1. INTRODUCTION

Contemporary business environment has a subject 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 (Dekleva, 1999). If a company wants to react to all this exterior challenges and changes, it must be adaptable and capable of fast changes in its operation, and at the same time it must add a different or higher value to its products. Therefore, next to contemporary technologies, the companies need knowledge to use them and to develop further. This knowledge and capacity of creation can be found (only) in workers, in people (Pučko, 1998). Mihelčič (2008) states that next to knowledge, people also have willingness to properly form new social relations. With this, they have a significant influence on the basic element of the organization and success of companies.

Numerous authors realize that next to people's efficiency, also their creativity is becoming more and more important (Pučko, 1998, Mihelčič, 2008). Human creativity and innovation and desire to create new things are the basic pillars of progress (Mihelčič, 2008). Employees and their capacities (and knowledge) are therefore the base of operation of every company and the holders of the change realization. We can assert that recruitment is one of the key processes for ensuring (long-term) success of the company, as it depends on the employees, how much and what knowledge the company has. Knowledge is also a condition for the capacity to adapt to new market demands, for higher added value in production and for high creativity potential, which is shown as innovation in practice.

According to previous researches (Tratnik, 2001; Kropivšek, 2003), implemented in Slovenian wood-industry companies, we can assert that there is not enough knowledge in the companies. This can be seen in the qualification structure, which is rather unfavorable from knowledge point of view. In our research we wanted to discover the present condition and how it is changing with time.

2. WORKING METHOD

The research was made in consecutive separated stages. In the first stage we checked the available data about staffing and qualification structure from previous years. In the second stage we compared the data from these analyses with the results of analysis of the situation, which was implemented in Slovenian wood-industry companies, and where we used the method of classic questionnaire (inquiry). We analyzed 15 questionnaires from wood-industry companies of all sizes. Each company filled out a questionnaire for all its employees. The research covered almost 17% of all population employed in Slovenian wood-industry (3210 employees).

3. RESULTS

According to results in inquired companies, **61%** of employees in Slovenian wood-industry are male and **39 %** are female (Figure 1).

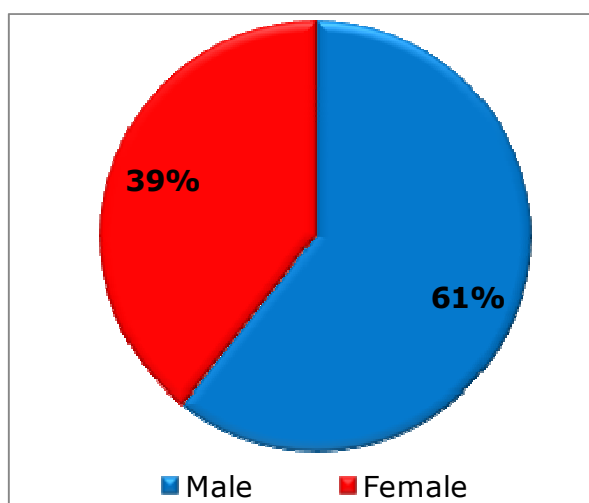
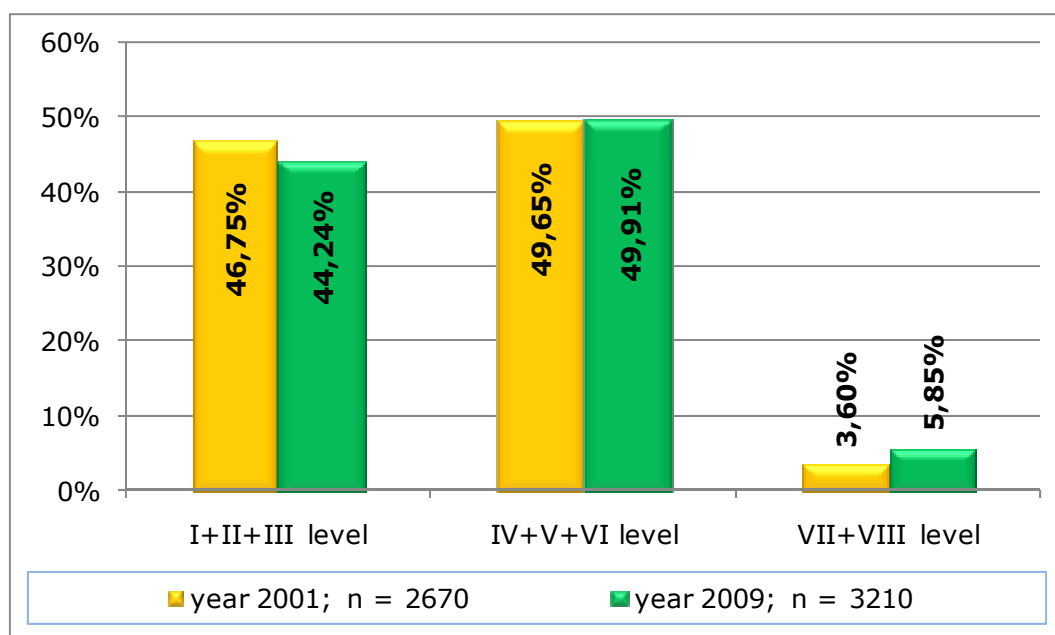


FIGURE 1. Gender structure of employees (in 2009)

When assessing the educational structure in Slovenian wood-industry companies, we wanted to know, if it has changed in any way through recent years. Using a sample of 15 Slovene wood-industry companies with a total of 3210 employees we realized, that a good 44% of employees has less than vocational education – mostly trained workers with finished or unfinished primary school (Figure 2). Approximately one quarter of employees has vocational education (mostly joiner), and a feeble quarter of employees have technical and higher education. Slightly less than 6% of employees have more than higher education. Tratnik (2001) has acquired similar results in year 2001, using a sample of 6 Slovenian wood-industry companies with a total of 2697 employees, and assessing that most of the employees have lower education levels, as the share of workers with unfinished primary school, finished primary school and lower vocational school, was 46,7%. This means, that within the past years a share of those employees slightly decreased (for app. 3%). A share of employees with secondary vocational school and vocational college in 2001 was 49,6% and stayed on approximately the same level. The share of employees with professional college, university education and master or PhD increased from 3,6% in 2001 to feeble 6% in 2009. (Figure 2)

Considering the fact that wood-industry industry is one of intensive labor branches, the result was expected. We can conclude that the educational structure is relatively unfavorable, since the structural parts of groups with lower educational level are significantly bigger.



Legend – education levels:

Primary school or less - **I. in II. Level**, short training - **USO** - **III. Level**,
 Vocational school - **IV. Level**, secondary school - **V. Level**, vocational college (I. level) - **VI. Level**,
 University, professional college, art college - **VII. Level**, specialization or master - **VII./2 Level**, PhD - **VIII. Level**

FIGURE 2. Comparison of educational structure of employees in years 2001 and 2009

To compare the educational structure we implemented a statistic test, where we verified, if the frequencies (or percentage) from the year 2009 are in accordance with (expected) statistics from the year 2001. For this we used data from Figure 2.

We used χ^2 - test (Chernoff H, Lehmann E.L., 1954).

Significance level α was 0,05. We made the following zero and alternative hypothesis:

H_0 : educational structure in Slovenian wood-industry companies is the same in years 2009 and 2001.

H_1 : educational structure in Slovenian wood-industry companies has changed from year 2001 to 2009.

We calculated the Pearson χ^2 – statistics with formula (1):

$$\chi^2 = \sum_{i=1}^k \frac{(f_i - f'_i)^2}{f'_i} = \sum_{i=1}^k \frac{(p_i n - p'_i n)^2}{p'_i n} = \sum_{i=1}^k \frac{(p_i - p'_i)^2 n}{p'_i}, \quad (1)$$

where k marks the number of classes in distribution, f_i is the actual frequency of i-class, f'_i expected frequency of i-class, p_i actual share of i-class, p'_i expected share of i-class and n the size of the sample.

For our data, k=3, n=3210, p_i adequate shares for year 2009 in p'_i adequate shares for year 2001.

$$\chi^2 = 49,51$$

We compared it to the value of the table for χ^2 - distribution.

$$\chi_{\alpha}^2(k-1) = \chi_{0,05}^2(2) = 5,991$$

As the calculated value is bigger than the value that we got in the table, we can reject the zero hypothesis. At a significance level of 0,05 we can claim, that the educational structure in Slovenian wood-industry companies has changed from the year 2001 to year 2009. From our calculation we can see, that in spite of confirming the relatively unfavorable educational structure, it is still statistically significantly better in comparison with the year 2001 and that the change happened mostly in percentage of employees with VII. and VIII. level of education. Exactly those employees are the ones that bring knowledge and capacity of creative thinking.

In production, the educational structure in 2001 was even slightly worse, since according to one of the researches, which captured 42 of Slovenian wood-industry companies, 42% of employees in production were non-qualified, meaning finished or unfinished primary school (I. and II. Level of education) (Kropivšek, 2003).

While studying the educational structure of employees we realized that there the highest share of staff secondary and also higher education and graduates have the education from the field of wood science – more than 43%. App. 10% of employees has education from the field of economy, followed by mechanical engineering (a bit less than 6%) and the other fields are represented in a smaller scope.

4. DISCUSSION AND CONCLUSIONS

The results of the research have shown that the educational structure in Slovenian wood-industry companies is relatively unfavorable, since there is a strong prevalence of structure shares with lower levels of education. Almost half of the employees have an unfinished primary school, finished primary school or lower vocational school. The biggest problem of such structure is that, due to lack of knowledge and competences, the employees with lower educational levels are more difficult to train for implementation of more complex procedures and tasks, which are one of important results of the business processes reengineering. Also the level of creativity and innovation in companies is much smaller because of this. On the other hand, the comparison of results with findings from previous years showed that the educational structure of employees in Slovenian wood-industry companies has improved mostly due to a larger share of employees with higher education and graduate, master and PhD. Those employees dispose with great knowledge and creativity; therefore they are or should be the main holders of innovation process, whose efficiency is the condition for long-term efficiency of (wood-industry) companies. The prevalent share of education from the field of wood science is completely expected and due to great stress on the production process also completely normal. Wood-industry is one of labor intensive branch, but due to certain particularities and types of work this field is interesting also for women, although the men are still prevailing.

Existing educational structure represents a great barrier to introduction of new technologies, adaptation to changes and development, since those processes above all need creativity and innovation, as well as creation of different organizational conditions of work. In the research, next to other findings we also realized that the employers consider innovation, self-initiative and creative thinking of the employees as very important competences, but the current situation of these competences is relatively poor. This (can) mean that the further education and training must be oriented in the direction of acquiring that knowledge and competences.

The presented condition in Slovenian wood-industry companies is the base for finding solutions. In short-term as well as in long-term it is necessary to ensure constant and goal-oriented investing in education and training of employees on all levels, since this is the only way to ensure adequate knowledge and competences of the employees, which are indispensable for further development of the

companies (and of the branch). This will not contribute so much to the improvement of the educational structure, which is and must be the long-term goal of the companies and of branch policy, but it will still be ensured a higher level of key knowledge and competences in the companies, with which their competitive ability can be improved. A higher level of knowledge and competences will ensure not only the positive effect on the quality of business process implementation and adaptability of operation, but also greater capacity of innovation and creativity, which are of key importance for long-term efficiency of companies and of Slovenian wood industry.

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COMPARISON OF INFORMATION SYSTEM BY SWOT ANALYSIS

Vojtech Demoč, Patrik Aláč,

Abstract:

The main goal of our paper is to compare Information System (IS) MAX with IS MAX 2 Plus. We have tried to analyse advantages of IS MAX 10 and possibilities of its improving with upgrade MAX 2 Plus in particular company. We have used the method of SWOT analysis. We have defined strengths and weaknesses, and also opportunities and threats of these IS. On the base of reached results we have suggested the strategy and particular solutions.

Key words: information system, strength, weaknesses, opportunities, threats, strategy.

1. THE ANALYSIS OF INFORMATION SYSTEM MAX

MAX is complex information system for enterprise processes. It's fully ready for market of European Union. It's possible to use it on the base of EDI communication. Recently they were presented the tools of e-business in IS MAX in Great Britain, Czech republic and also in Slovakia. The system is successful implemented not only in Slovak Republic but all over the world. The number of sold and installed systems reached some hundreds.

2. THE COMPARISON OF INFORMATION SYSTEMS MAX

MAX 10

Complex IS was provided by ICL SLOVAKIA. This IS is designed for factories. It is necessary to implement this IS step by step according to particular requirements of each company. In 1st January 2002 IS MAX was implemented there. It's implementation remained six months. But then IS MAX seemed to be incompatible with other corporate systems e.g. SYSKLAS, GEMINI, HUMAN and INTERNAL System VIS. This Information System consists of 5 parts: Sales; Purchase; Production; Marketing; Finance.

MAX 2 PLUS

MAX 2 PLUS is upgrade version of MAX 10. The main difference between them is in the format. MAX 10 works in text format and MAX 2 PLUS works in graphic format. In 1st January 2007 IS MAX 2 PLUS was put into operation and it's implementation still remains. The necessary of IS change was involved by new Slovak legislation. In the future, the company plans implementation of IS MAX 3 PLUS. They signed the contract with supplier of this IS. The main problem with new IS – MAX 2 PLUS was in printing. This was caused by the change from text to graphic format.

3. SWOT ANALYSIS OF IS MAX 10

“SW” analysis of the previous IS

Table 1. The analysis of strengths and weaknesses of MAX 10

| EVALUATED FACTOR | Activity | | | | | Importance | | | | |
|------------------------------------------|----------|---|---|---|---|------------|---|---|---|---|
| | 0 | 1 | 2 | 3 | 4 | 0 | 1 | 2 | 3 | 4 |
| 1. Information technology | | | | | | | | | | |
| 1. Development of IS | | | x | | | | | | x | |
| 2. Technical security of IS | | | | x | | | | | | x |
| 3. Communication | | x | | | | | | | | x |
| 4. Maintenance of IS | | x | | | | | | | x | |
| 5. Connection of programs | | | | | x | | | | | x |
| 2. Human resources | | | | | | | | | | |
| 6. The quality of work | | | | | x | | | | | x |
| 7. Company atmosphere | | | x | | | | | | | x |
| 8. Working performance | x | | | | | | | x | | |
| 9. Faster communication | | | | x | | | | | | x |
| 10. Work-time reduction | | | | | x | | | x | | |
| 3. Production | | | | | | | | | | |
| 11. Production costs | | | | x | | | | | | x |
| 12. Technology preparation of production | | x | | | | | | x | | |
| 13. Economy in production | | | x | | | | | | | x |
| 14. Quality | | | | x | | | | | | x |
| 15. Flexibility | | x | | | | | | | x | |
| 4. Management | | | | | | | | | | |
| 16. In-plant information | | | | | x | | | | | x |
| 17. Control | | | x | | | | | | | x |
| 18. Competitiveness | x | | | | | | | | | x |
| 19. Decision making flexibility | | x | | | | | | | x | |
| 20. Purchase, sales, marketing | | | | x | | | | | x | |
| 5. Finance | | | | | | | | | | |
| 21. Costs of IS purchase | | x | | | | | | | | x |
| 22. Costs of implementation | | x | | | | | | | | x |
| 23. Reduction of total costs | | | | | x | | | | | x |
| 24. Trend of income | | | | | x | | | | | x |
| 25. Costs of software | | x | | | | | | x | | |

Notice:

Activity

- 0 – very bad
- 1 – bad
- 2 – adequate
- 3 – good
- 4 – very good

Importance

- 0 – not important
- 1 – little importance
- 2 – medium importance
- 3 – high importance
- 4 – very high importance

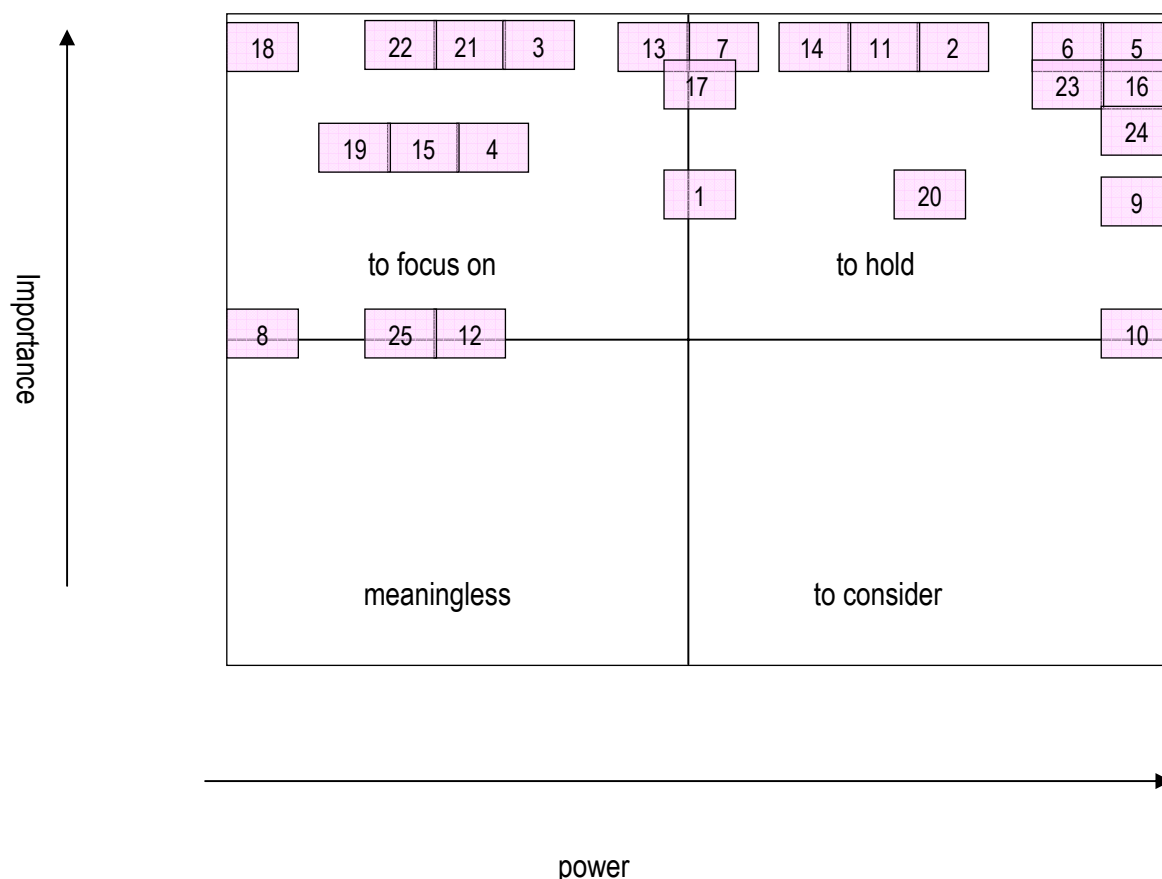


Figure 1. Matrix power -importance

Majority of evaluated factors placed in upper quadrants. In right upper quadrant are factors which mean the strengths of the company:

Technical security of IS, Connection of programs, The quality of work, Production costs, Quality, In-plant information, Purchase, sales, marketing, Company atmosphere, Faster communication, Reduction of total costs, Trend of income, Control

These factors have positive impact on prosperity of the company.

In left upper quadrant are these factors:

Development of IS, Maintenance of IS, Technology preparation of production, Flexibility, Competitiveness, Communication, Working performance, Costs of IS purchase, Costs of implementation, Costs of software, Decision making flexibility

The method of SW analysis:

1. For the analysis of strengths and weaknesses we have chosen the method of conversation with individual employees of department. On the base of the conversation we have specified key factors which impact company's performance related to IS function.
2. Then we have evaluated factors according to importance for the company and according to their strength on the total company's running.
3. The result of evaluation is presented in the matrix of 2 variables: power – importance.

“OT” ANALYSE OF THE PREVIOUS INFORMATION SYSTEM

On the base of opportunities and threats analysis which characterize company's environment we have defined the following threats:

Table 2. External risk analysis

| Evaluated factors | Probability of appearance | | Importance | |
|------------------------------------------------------------------------|---------------------------|-----|------------|-----|
| | high | low | high | low |
| 1. Increasing number of competitors | x | | x | |
| 2. Competitiveness | x | | x | |
| 3. Entrance of low cost foreign competitors | | x | x | |
| 4. Decreasing number of customers | x | | x | |
| 5. Unpredictable economic situation after the adoption of new currency | x | | x | |

On the base of these risks we have designed matrix of threats according to probability of their appearance and importance. It is given in Figure 2.

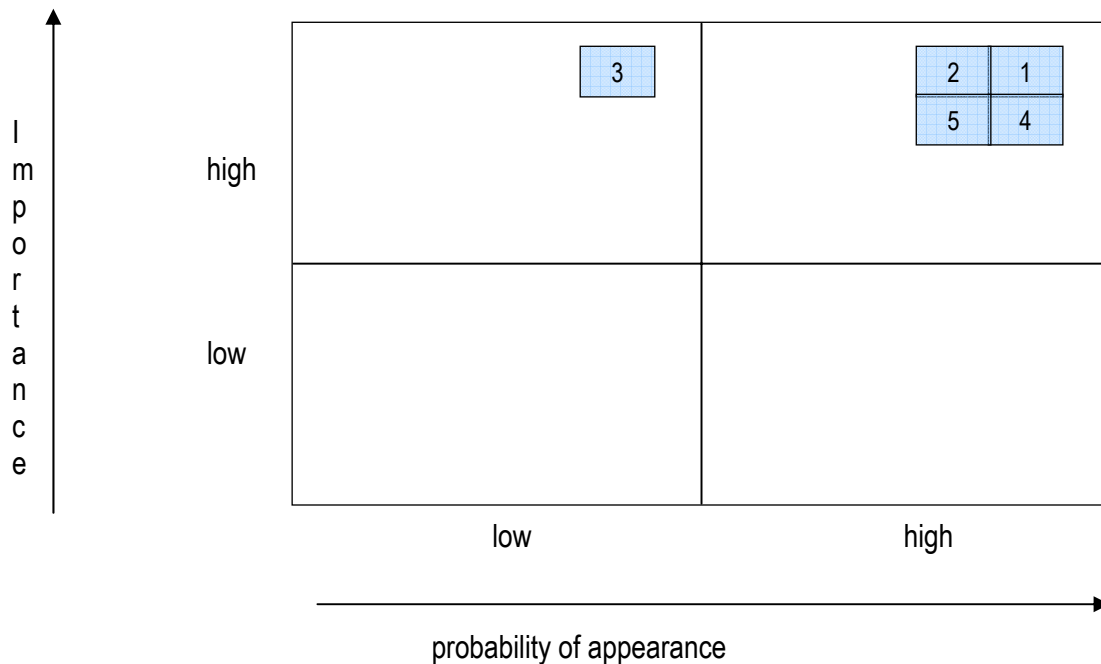


Figure 2. Matrix of threats

In right upper quadrant they are very important factors with the high probability of appearance. For the company there are the most important threats which can come in the near future. The company should make arrangements for their minimization. We have also defined opportunities which are evaluated in the next external analysis.

Table 3. External analysis of opportunities

| Evaluated factors | The probability of success | | Attractiveness | |
|----------------------------------------------------------------------|----------------------------|-----|----------------|-----|
| | high | low | high | low |
| 1. Ability to find next customers | x | | x | |
| 2. Ability to reach new markets | x | | x | |
| 3. Ability to be market leader | | x | x | |
| 4. Ability of business growth after enter into Schengen territory | | x | x | |
| 5. Ability to improve economic situation after new currency adoption | x | | x | |

On the base of the opportunity's evaluation we have designed the matrix of opportunities.

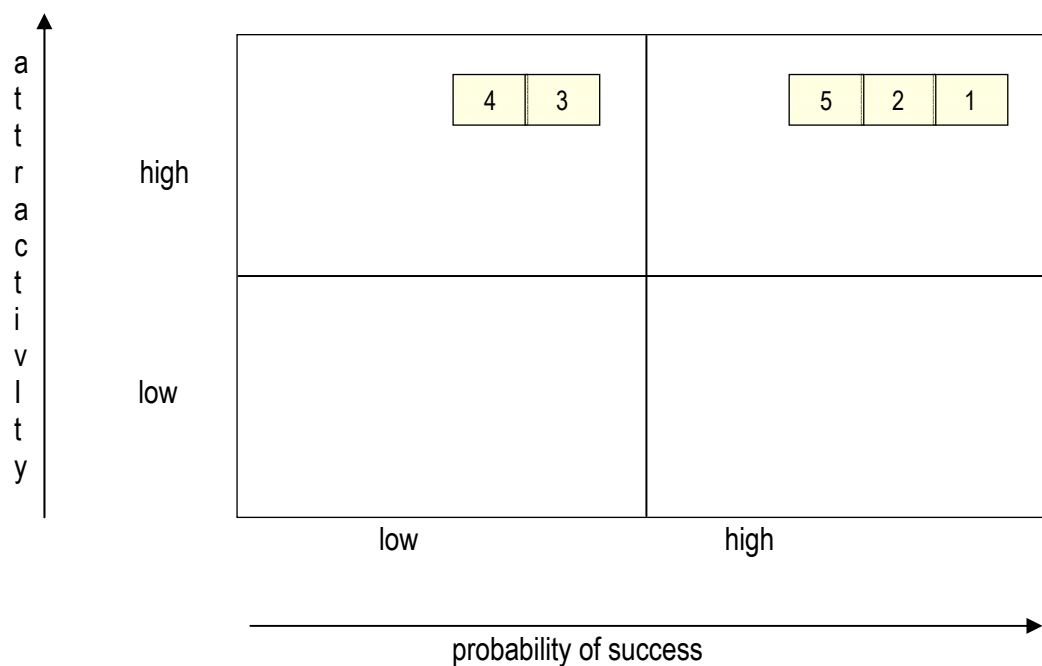


Figure 3. Matrix of opportunities

In right upper quadrant of opportunities matrix, there are very attractive and important factors for the company. The company should effectively utilize these opportunities as soon as possible.

4. SWOT ANALYSIS OF THE NEW IS - MAX 2 PLUS

“SW” analysis

Table 4. Analysis of strengths and weaknesses of MAX 2 PLUS

| | Performance efficiency | | | | | Importance | | | | |
|------------------------------------------|------------------------|---|---|---|---|------------|---|---|---|---|
| | 0 | 1 | 2 | 3 | 4 | 0 | 1 | 2 | 3 | 4 |
| EVALUATED FACTORS | | | | | | | | | | |
| 1. Information technology | | | | | | | | | | |
| 1. Development of IS | | | | x | | | | | x | |
| 2. Technical security of IS | | | | x | | | | | | x |
| 3. Communications | | | | | x | | | | | x |
| 4. Maintenance of IS | | | | x | | | | | x | |
| 5. Compatibility of programs | | | | | x | | | | | x |
| 2. Human resources | | | | | | | | | | |
| 6. The quality of work | | | | | x | | | | | x |
| 7. Company atmosphere | | | | x | | | | | | x |
| 8. Working performance | | | x | | | | | | x | |
| 9. Faster communication | | | | | x | | | | | x |
| 10. Work-time reduction | | | | | x | | | | | x |
| 3. Production | | | | | | | | | | |
| 11. Production costs | | | | x | | | | | | x |
| 12. Technology preparation of production | | | | | x | | | | x | |
| 13. Economy in production | | | | x | | | | | | x |
| 14. Quality | | | | | x | | | | | x |
| 15. Flexibility | | | | x | | | | | x | |
| 4. Management | | | | | | | | | | |
| 16. In-plant information | | | | | x | | | | | x |
| 17. Control | | | | x | | | | | | x |
| 18. Competitiveness | | | | | x | | | | | x |
| 19. Decision making flexibility | | | | x | | | | | x | |
| 20. Purchase, sales, marketing | | | | | x | | | | x | |
| 5. Finance | | | | | | | | | | |
| 21. Costs of IS purchase | | x | | | | | | | | x |
| 22. Costs of implementation | | x | | | | | | | | x |
| 23. Reduction of total costs | | | | | x | | | | | x |
| 24. Trend of income | | | | | x | | | | | x |
| 25. Costs of software | | | x | | | | | x | | |

Activity

0 – very bad

1 – bad

2 – adequate

3 – good

4 – very good

Importance

0 – not important

1 – little importance

2 – medium importance

3 – high important

4 – very high importance

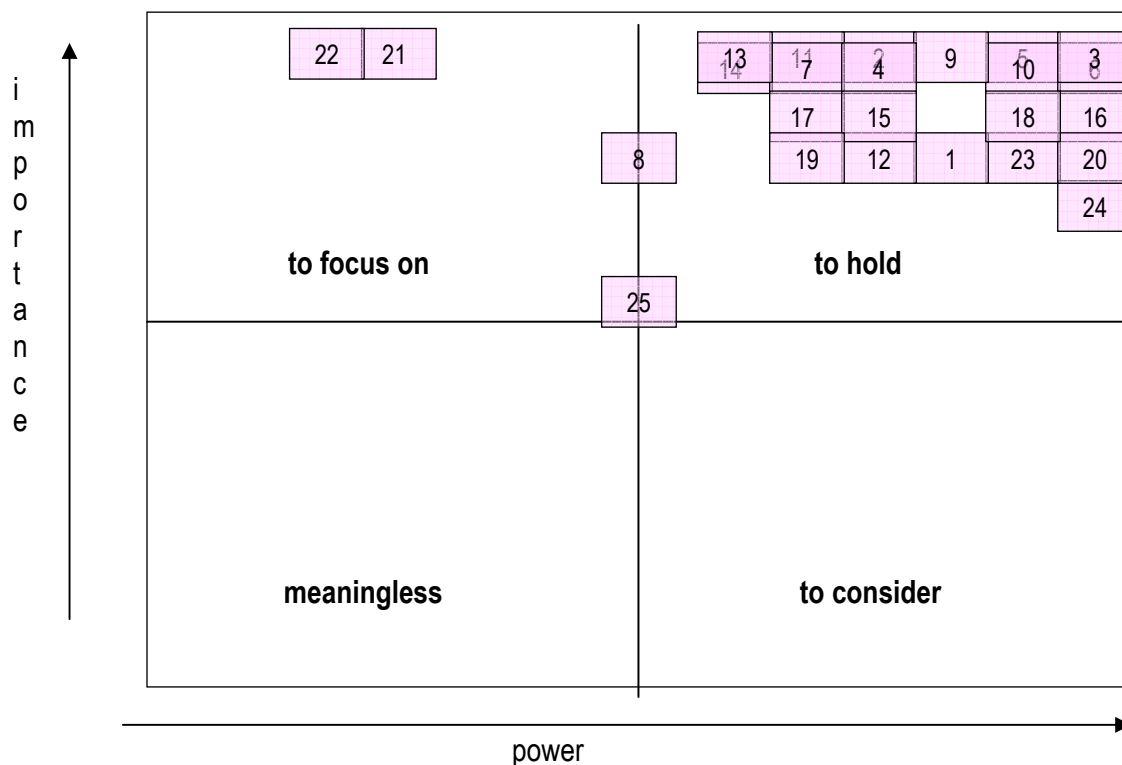


Figure 4 Matrix power – importance

SW analysis is used for the definition of strengths and weaknesses of a company. Strengths are:

Development of IS, Technical security of IS, Communications, Maintenance of IS, Compatibility of programs, The quality of work, Company atmosphere, Faster communication, Work-time reduction, Production costs, Technology preparation of production, Economy in production, Quality of production, Flexibility in production, In-plant information, Control, Competitiveness, Decision making flexibility, Purchase, sales, marketing, Reduction of total costs, Trend of income.

The weaknesses are presented below:

Costs of IS purchase, Costs of implementation, Working performance, Costs of software.

It's necessary to focus on them and to regulate them.

"OT" analysis

New IS provides new possibilities of its utilization. We have evaluated the same opportunities and threats as during analysis of IS MAX 10. But of course, the probabilities are different.

Table 5. External analysis of threats

| Evaluated factors | Probability of appearance | | Importance | |
|------------------------------------------------------------------------|---------------------------|-----|------------|-----|
| | high | low | high | low |
| 1. Increasing number of competitors | x | | x | |
| 2. Competitiveness | x | | x | |
| 3. Entrance of low cost foreign competitors | | x | x | |
| 4. Decreasing number of customers | x | | x | |
| 5. Unpredictable economic situation after the adoption of new currency | x | | x | |

Evaluated threats of external analysis is presented in the following matrix.

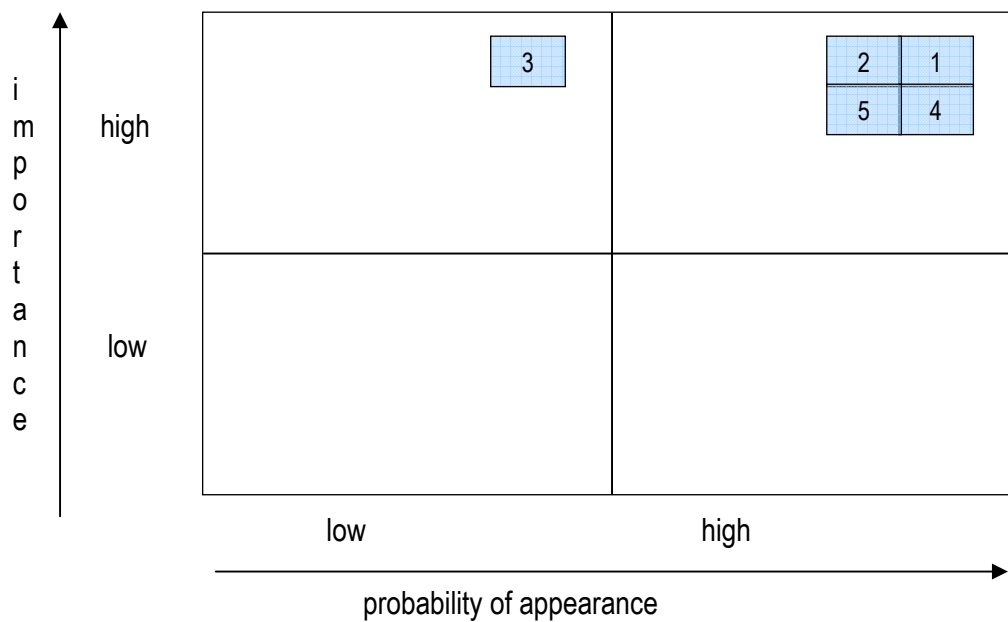


Figure 5. Matrix of threats

Is is evident that application of new IS doesn't impact the threats of company's – background. In right upper quadrant there are important factors with high probability of appearance. They can impact the success of company which should monitor these factors.

In left upper quadrant there is one factor – entrance of low cost competitors. The company have to monitor these external factors in order to avoid them in the future and to strengthen its position in the market.

Table 6. External analysis of opportunities

| Evaluated factors | The probability of success | | Attractiveness | |
|--------------------------------------------------------------------------|----------------------------|-----|----------------|-----|
| | high | low | high | low |
| 1. Ability to find next customers | x | | x | |
| 2. Ability to reach new markets | x | | x | |
| 3. Ability to be market leader | x | | x | |
| 4. Ability of business growth after enter into Schengen territory | x | | x | |
| 5. Ability of improving economical situation after new currency adoption | x | | x | |

Opportunities are evaluated by external analysis. Then they are designed in matrix of opportunities.

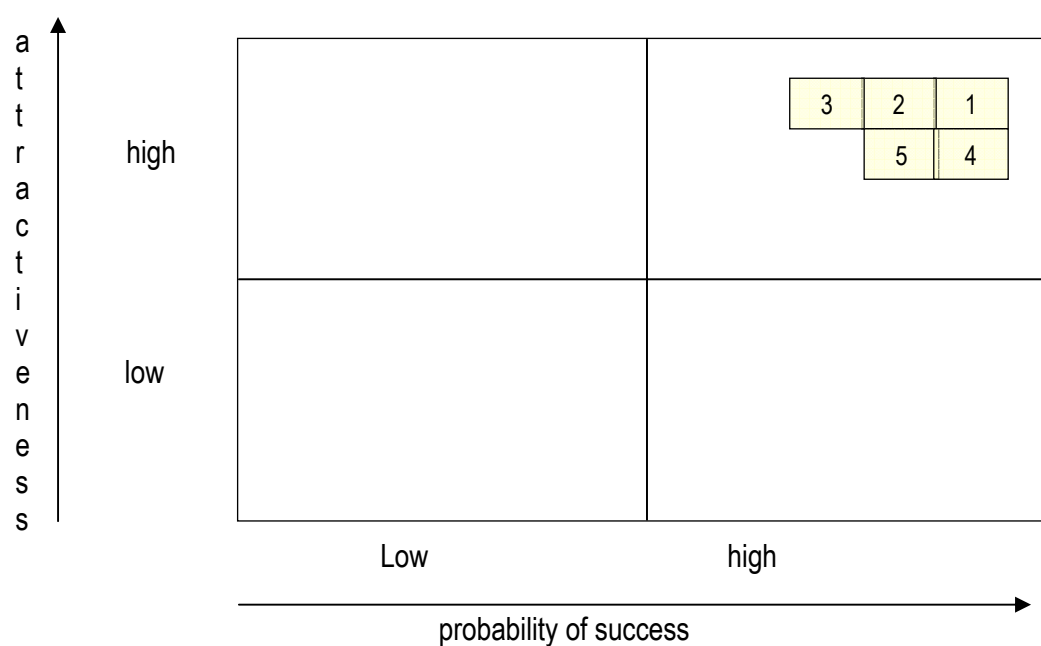


Figure 6. Matrix of opportunities

By application of new IS it will be possible to reach majority of market opportunities. All evaluated factors are in upper right quadrant. All these factors have high attractiveness for the company and also high probability to reach a success.

5. COMPLEX SWOT ANALYSIS

By the combination of SW and OT analysis we get complex SWOT analysis. It shows and quantifies strengths and weaknesses, opportunities and threats.

Table 7. Evaluation of SWOT analysis for IS MAX 10

| Strenghts of the company | | Weaknesses of the company | |
|-----------------------------------------------------------------------|-----------|--------------------------------------------------------------|-----------|
| Technical security of IS | 4 | Development of IS | 5 |
| Compatibility of programs | 5 | Maintanance of IS | 5 |
| The quality of work | 5 | Technology preparation of production | 5 |
| Production costs | 4 | Flexibility in production | 3 |
| Quality of production | 4 | Competitiveness | 5 |
| In-plant information | 5 | Communication | 5 |
| Purchase, sales, marketing | 5 | Working performance | 4 |
| Company atmosphere | 4 | Costs of IS purchase | 5 |
| Faster communication | 4 | Costs of implementation | 5 |
| Reduction of total costs | 5 | Costs of software | 5 |
| Economy in production | 3 | Decision making flexibility | 4 |
| Trend of income | 5 | Work-time reduction | 5 |
| Control | 5 | | |
| TOTAL | 57 | TOTAL | 56 |
| Opportunities | | Threats | |
| Ability to find next customers | 4 | Increasing number of competitors | 5 |
| Ability to reach new markets | 3 | Competitive force | 5 |
| Ability to be market leader | 2 | Entrance on market of cheaper competitors | 3 |
| Ability of business growth after enter into Schengen territory | 4 | Decreasing number of customers | 5 |
| Ability of improving economical situation after new currency adoption | 3 | Possibility of degradation in case of the using new currency | 5 |
| Total | 16 | Total | 23 |

Table 8. Evaluation of SWOT analysis for IS MAX 2 PLUS

| Strenghts spots of company | | Weak spots of company | |
|-----------------------------------------------------------------------|-----------|--------------------------------------------------------------|-----------|
| Technical security of IS | 4 | Working performance | 4 |
| Compatibility of programs | 5 | Costs of IS purchase | 5 |
| The quality of work | 5 | Costs of implementation | 5 |
| Production costs | 4 | Costs of software | 5 |
| Production's quality | 4 | | |
| In-plant information | 4 | | |
| Purchase, sales, marketing | 4 | | |
| Company atmosphere | 3 | | |
| Faster communication | 3 | | |
| Reduction of total costs | 5 | | |
| Technology preparation of production | 4 | | |
| Work-time reduction | 4 | | |
| Competitiveness | 5 | | |
| Maintanance of IS | 4 | | |
| Communications | 5 | | |
| Production's flexibility | 3 | | |
| Economy in production | 3 | | |
| Development of IS | 5 | | |
| Decision making flexibility | 4 | | |
| Trend of income | 5 | | |
| Control | 3 | | |
| TOTAL | 86 | TOTAL | 19 |
| Opportunities | | Threats | |
| Ability to find next customers | 5 | Increasing number of competitors | 4 |
| Ability to reach new markets | 5 | Competitive force | 4 |
| Ability to be market leader | 3 | Entrance on market of cheaper competitors | 3 |
| Ability of business growth after enter into Schengen territory | 5 | Decreasing number of customers | 5 |
| Ability of improving economical situation after new currency adoption | 3 | Possibility of degradation in case of the using new currency | 3 |
| Total | 21 | Total | 19 |

We have designed absolute values in this way.

1. SWOT analysis of MAX 10

Strenghts – weaknesses = $57 - 56 = / 1 /$

Opportunities – threats = $16 - 23 = / -7 /$

2. SWOT analysis of MAX 2 PLUS

Strenghts – weak spots = $86 - 19 = / 67 /$

Opportunities – risks = $21 - 19 = / 2 /$

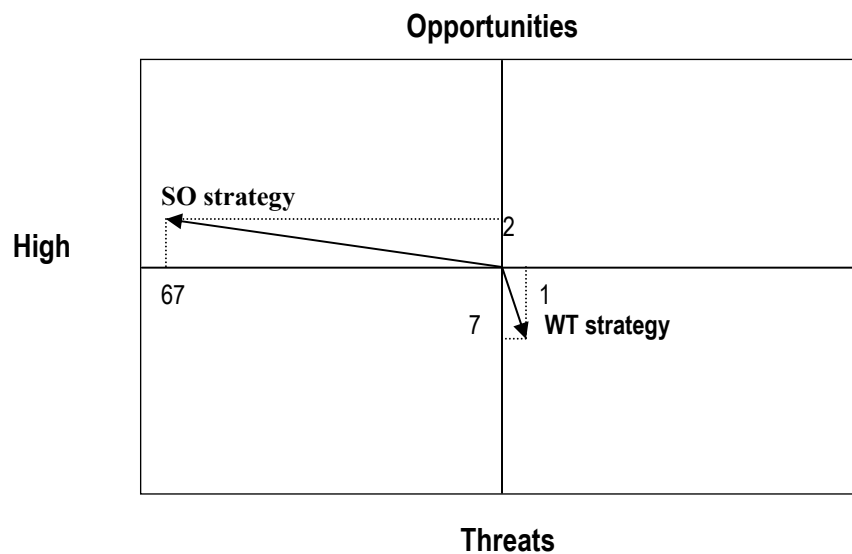


Figure 7. SWOT matrix

We have designed reached results in SWOT matrix presented in Figure 7. We have also defined strategy of both Information Systems. This strategy determines ranking into one of 4 quadrants according to prevailed features of IS.

From the SWOT analysis of IS MAX 10 we can see that this system had needed changes and it is good that the company decided to perform these changes.

On the base of SWOT matrix we have defined WT strategy, which is defined as divestment and defensive strategy. So, also the matrix confirms that the company do the best when it decided to improve its previous IS.

From the second SWOT analysis of new IS - MAX 2 PLUS we can see the improvement in company's performance. By SWOT matrix we have defined SO strategy for new IS, it means offensive and developing strategy. This strategy focuses on strengths of the company and it uses opportunities from environment.

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