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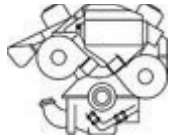
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Dear readers,

Welcome to the third issue of the MEST Journal, an international peer-referred academic journal, official journal of the non-profit organization MESTE. This issue is published online, as well as print (subscription).

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We introduced the practice that articles, that have undergone peer review, and will be published in the next issues, we make available to readers in the form of preview - early reading.

The focal point of the journal remained at international level, with the view on matters from a global perspective. Also, some papers concerning some local specific events are published in this issue. We follow the mission and vision of the journal and help authors to publish their works and present their achievements in the most convenient way. With its broad scope MEST Journal welcomes high quality, original research articles and reviews from scientists and professionals, professors and PhD students in the areas covered by its thematic, as it is shown in the *Thematic areas* on the page III, but these are not exclusive themed areas.

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I wish you all success in your future endeavors, and invite you to publish your works with our motto: "If you wish to be quoted, people first have to hear for you".

We will help you!

Zoran Čekerevac

Zoran Čekerevac
Editor-in-chief



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- Management in crisis situations
- Management in transport
- Technologies and quality tools in management
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- Innovation and technology
- Industrial research
- Technology forecasting
- Instrumentation and analytical techniques
- Specials of direct relevance to industrial entrepreneurs
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These are basic, but not exclusive themed areas.



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THE CORRELATION-REGRESSION MODELS USAGE AS A WAY TO INCREASE OF LABOR PRODUCTIVITY

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JEL category: **C3, C5, C6, J2, J24**

Abstract

The relationships between various factors and labor productivity are analyzed in the article. Analysis of labor productivity in the furniture enterprises Chernivtsi region is held. The correlation and regression analysis are conducted to select the factors that affect the change in labor productivity on the basis of financial reporting. The combination of variables is used for predicting values that can take the dependent variable, and calculated at a given set of values of input variables received. The multifactor regression models for enterprises furniture industry based on correlation analysis are created. The equation for the regression coefficients, which express the dependence of productivity growth factor sign are folding. The substantiated conclusions on the quantitative relationship between the level of labor productivity and organizational-economic factors are made. The similar and distinctive signs in regression models are revealed. The proposed models are appropriate for enterprises of all industries with the similar input parameters.

Keywords: labor productivity, number of employees, the rate of staff turnover, payroll, allowances and surcharge, correlation-regression models.

1. INTRODUCTION

The labor productivity is the main criterion of economic efficiency, the first condition for the growth of social production and the complex index of efficiency of the staff. Therefore, there is a need to quantify the influence of individual factors on labor productivity. The various factors

and effective signs should be evaluated comprehensively in their interrelation to identify those factors that affect the economic phenomenon and those that do not affect.

The significant contribution was made to the research value of factor-specific analysis of labor productivity by known scientists O. Akilina and L. Illich (Akilina & Illich, 2010), O. Grishnova (2007), N. Yesinova (2004), M. Sokolik (2010), I. Timosh (2001) and others. The numbers of theoretical and practical issues are unresolved, despite a

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considerable amount of previous research investigation. Questions to identify trends in labor productivity require research in enterprise practice and on this basis the ways of raising labor productivity can be possible.

The further development of labor productivity theoretical propositions and substantiation of practical recommendations based on the analysis of the factors affecting to increase the labor productivity are the main purposes of the article.

2. THE STUDY

We implied the correlation analysis to select the factors that affect the change in labor productivity. The object of this analysis is the enterprise furniture industry in Chernivtsi region. The approach to a representative sample was selected based on the average level of labor productivity in the business for the analyzed period (2006-2010). Therefore, enterprises are divided into three groups: Group C is the enterprises with low labor productivity, Group B is the enterprises with an average level of labor productivity, group A-the enterprise with a high level of labor productivity. The basic companies selected from each group give the continuity of work during the studied period.

The construction of correlation models enables to establish the relationship between the economic indicators that are not functionally linked. The correlation and regression models are constructed using the Microsoft Excel data analysis packet.

A density relation is measured by the absolute value of the correlation coefficient (R). The correlation between two features suggests a causal connection between them when either one of the signs is a partial cause of the other, or both symptoms are associated with common causes.

A zero indicates no linear relationship between variables. A maximum values ($R = +1$ and $R = -1$) ratio indicate full (or functional) linear relationship between variables (respectively functional direct link and functional feedback). Intermediate values indicate the following: the higher the absolute value of the index, the closer correlation. The quantifying correlations can help to discard irrelevant links and better outline the direction

searches to compare the impact of various factors etc.

The correlation analysis was applied to each group of enterprises furniture industry Chernivtsi region. There were analyzed the following factors: average number of employees, the number of managers, the number of employees who are hired, turnover ratio reception, the employee turnover coefficient, the number of employees having higher education, payroll, the effective fund-time, the fund of additional salary, allowances and bonuses, the cost of production, the volume of industrial output (in comparable prices), the value of fixed assets, the value of intangible assets, administrative expenses, the value of non-current and current assets, labor costs, total costs, average wage.

The factors that are positively or negatively correlated with productive of enterprises in the group C:

1. average number of employees ($R = -0.78$);
2. number of management personnel ($R = -0.69$);
3. number of employees having higher education ($R = +0.66$);
4. effective fund time ($R = -0.7$);
5. allowances and bonuses ($R = +0.76$).

The coefficient of employee turnover ($R = +0.39$), payroll ($R = -0.44$), fund of additional salary ($R = -0.38$), production costs ($R = -0.08$), the value of fixed assets ($R = +0.07$), the value of intangible assets ($R = +0.02$), the value of non-current and current assets ($R = +0.11$ and $R = -0.09$, respectively) administrative expenses ($R = -0.21$), total cost ($R = +0.03$), the number of employees who are hors ($R = -0.53$), turnover ratio reception ($R = 0.52$) and the average wage ($R = +0.3$) do not slow the density.

The factors that significantly affect the labor productivity of the enterprises in group B:

1. number of management personnel ($R = -0.64$);
2. coefficient of employee turnover ($R = -0.77$);
3. number of employees having higher education ($R = +0.6$);
4. allowances and bonuses ($R = +0.61$);
5. administrative expenses ($R = +0.61$);
6. average wage ($R = +0.69$).

Thus, the additional salary fund and the wage costs do not show close link with labor productivity ($R = +0.31$ and $R = +0.24$ accordingly).

So the fund of close correlation with labor productivity has the following factors as:

- a) average number of employees ($R = -0.29$),
- b) payroll ($R = 0.3$),
- c) effective fund-time ($R = -0.29$),
- d) award ($R = -0.3$),
- e) cost of production ($R = +0.37$),
- f) the value of fixed assets ($R = 0.13$),
- g) the value of intangible assets ($R = 0.13$),
- h) the value of non-current and current assets ($R = 0.06$ and $R = 0.3$ respectively),
- i) total cost ($R = 0.29$),
- j) number of employees who are hors ($R = -0.58$),
- k) ratio of employee turnover ($R = -0.52$).

The factors that are positively or negatively correlated with productive for groups A:

1. number of management personnel ($R = -0.62$);
2. number of employees having higher education ($R = +0.62$);
3. allowances and bonuses ($R = +0.61$);
4. average wage ($R = +0.6$).

We can make a conclusion that despite the fact that the allowances and bonuses are positively correlated with labor productivity ($R = +0.61$), in general, the additional salary fund for this group of enterprises is ineffective because it does not affect the figure resulted ($R = +0.021$). Also, this analysis suggests that administrative expenses and labor costs are not the optimal structure as well as not closely related with labor productivity ($R = -0.07$ and $R = -0.09$, respectively). It does not demonstrate the connection of:

- a) employees average number density ($R = -0.46$),
- b) coefficient of employee turnover ($R = +0.22$),
- c) payroll ($R = -0.21$),
- d) effective fund-time ($R = -0.46$),
- e) the value of fixed assets ($R = -0.25$),
- f) the value of intangible assets ($R = -0.45$),
- g) the value of non-current and current assets ($R = -0.36$ and $R = -0.43$, respectively),
- h) total cost ($R = -0.33$),

- i) the number of employees who are hors ($R = -0.14$),
- j) turnover ratio reception ($R = -0.15$).

The next stage of our research is to conduct regression analysis. The combination of variables obtained in the course of regression analysis is used to predict values that can take the dependent variable, which is calculated for a given set of input variables value. The regression coefficients are calculated in the generated tables that allow an equation expressing the dependence of labor productivity growth factor features.

The functional dependence of the resulting regression analysis we got the form:

$$y_C = 44.608 - 0.886 \cdot x_1 + 0.745 \cdot x_2 - 0.004 \cdot x_3 - 2.024 \cdot x_4 + 0.0009 \cdot x_5$$

where:

- y_C - level of labor productivity, thousand UAH;
 x_1 - number of management personnel, persons;
 x_2 - number of employees having higher education, persons;
 x_3 - allowances and bonuses, thousand UAH;
 x_4 - average number of employees, persons;
 x_5 - effective fund-time, man per hours.

It should compare the model results with the actual performance of productivity in order to estimate the accuracy of the construction (chart 1).

The multifactor regression model for group enterprises to companies with an average level of labor productivity is:

$$y_B = 10.845 - 2.634x_1 + 3.082x_2 - 0.197x_3 - 2.415x_4 + 0.042x_5 - 1.312x_6$$

- where: y_B is a level of labor productivity, thousand UAH;
 x_1 - number of management personnel, persons;
 x_2 - number of employees having higher education, persons;
 x_3 - allowances and bonuses, in thousand UAH;
 x_4 - average wages, in thousand UAH;
 x_5 - administrative expenses, thousand UAH;
 x_6 - coefficient of employee turnover.

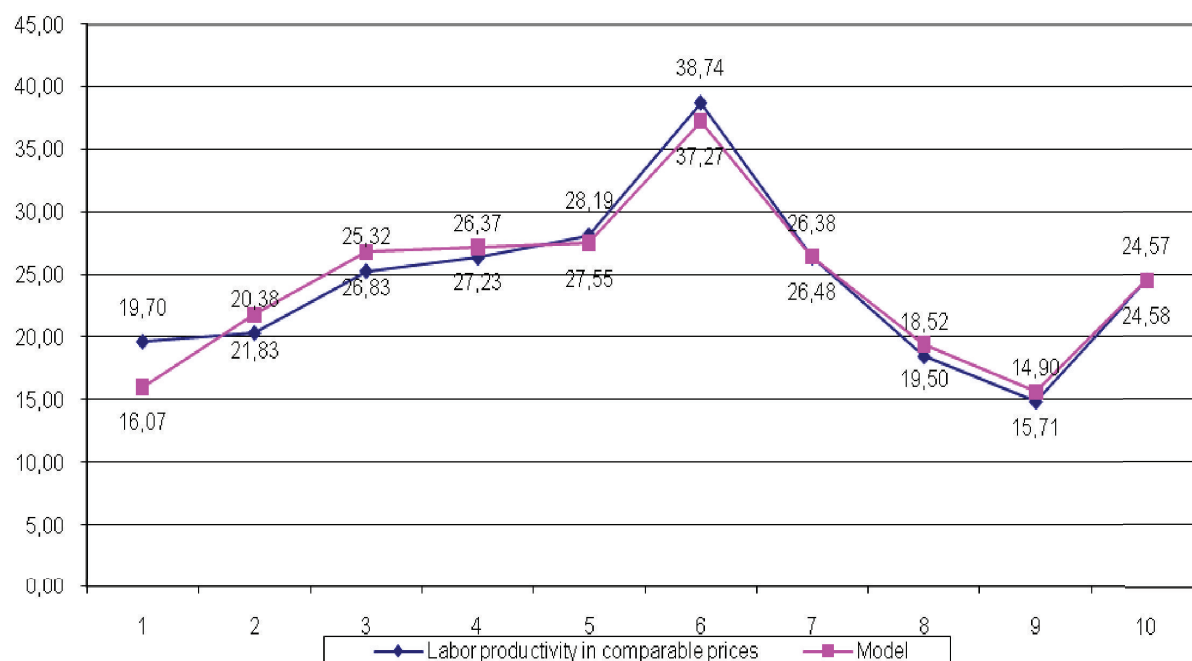


Chart 1 Graphical interpretation of the comparison of actual labor productivity and performance model for enterprise in group C (Source: Compiled by the author O. Petrashchak)

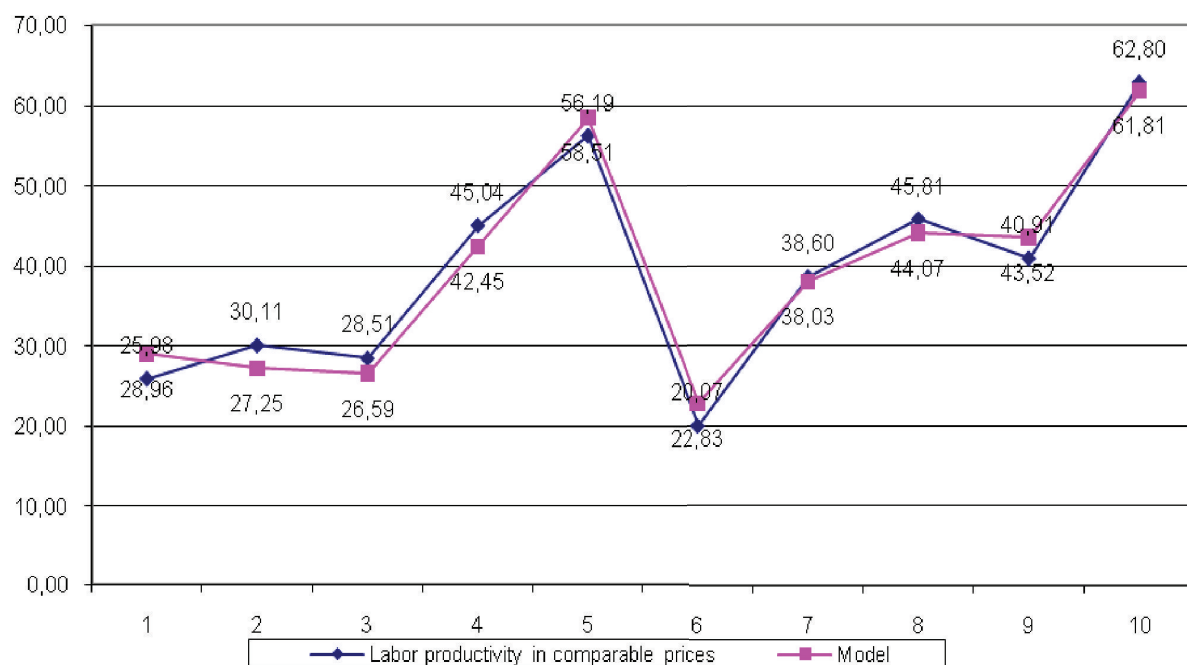


Chart 2 Graphical interpretation of the comparison of actual labor productivity and performance model for enterprises group B (Source: Compiled by the author O. Petrashchak)

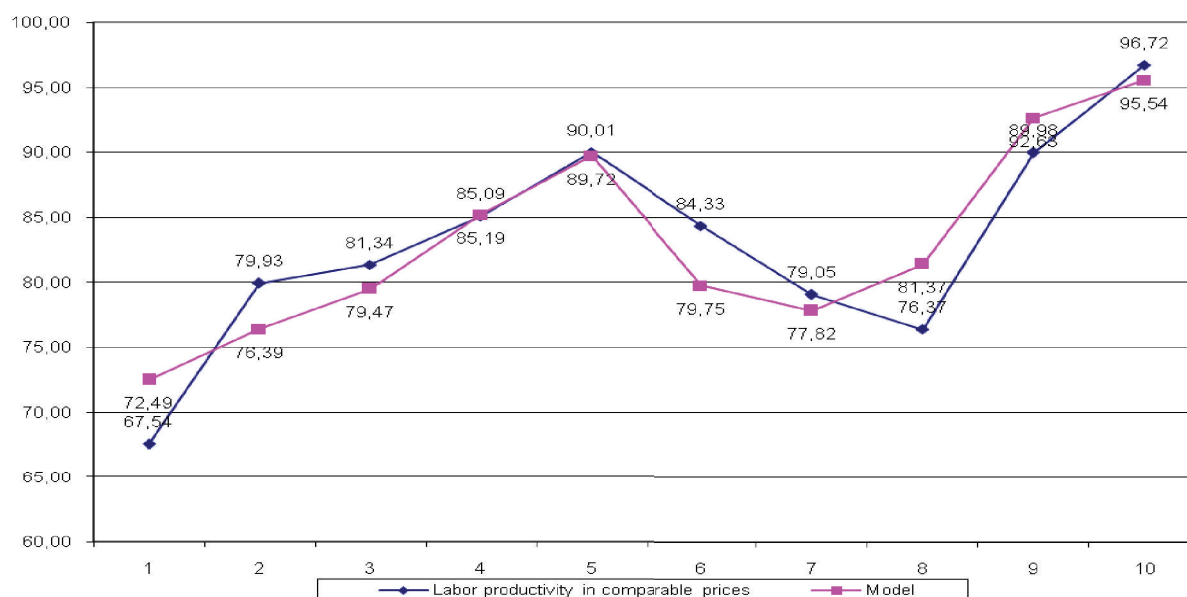


Chart 3 Graphical interpretation comparison of actual labor productivity and performance model for enterprises in group A (Source: Compiled by the author O. Petrashchak)

The results comparison of an econometric model of the actual labor productivity is presented in the chart 2.

The multifactor econometric model for enterprises in group A obtained from the regression analysis is as follows:

$$y_A = 66.125 - 0.882 \cdot x_1 + 0.621 \cdot x_2 + 0.042 \cdot x_3 + 2.185 \cdot x_4$$

where:

y_A - level of labor productivity, thousand UAH;

x_1 - number of management personnel, persons;

x_2 - number of employees having higher education, persons;

x_3 - allowances and bonuses, thousand UAH;

x_4 - average wages, thousand UAH;

We should compare the model results with the actual labor productivity in order to estimate the construction accuracy (chart 3).

3. CONCLUSIONS

Thus, regression models constructed for companies' furniture industry have similar symptoms as well as some significant differences. The number of management personnel in all models demonstrates the opposite effect on labor productivity and the number of employees who have higher education shows the direct. The value of allowances and

bonus payments in the model for enterprises group A has a direct connection to the resultant figure, and models for business groups B and C has reverse that allows to conclude the ineffectiveness of these payments on the last business groups. The average wages directly influences labor productivity in business models for group A, while in group B business models are inversely, and for group C enterprise it is not generally correlated with the dependent variable, which shows the above conclusion. The coefficient of employee turnover shows feedback from the dependent variable in the model for enterprises group, and direct for administrative costs. The average number of employees in the model for enterprise group C negatively affects level of labor productivity, which is associated with high rates of reception and turnover, and positively is fund-time effective. Thus, the analysis of labor productivity in the furniture business Chernivtsi region is based on a comparison of information obtained during the measurement and evaluation of the productivity levels and is the basis for further search of reserves growth in labor productivity.

Since it is conclusion in the market economy, it is the main precondition for the creation of competitive products, increase in internal market and the possibility of decent representation national products in the world market.

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THE EUROPEAN COUNCIL AND THE COUNCIL OF THE EU - PAST, PRESENT AND FUTURE

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JEL category: **F, F01, F15**

Abstract

The European Council and the Council of the European Union are two of the main institutions of the European Union. The first holds the political powers of the organization, being fundamental in its development and deeper integration as all the Treaties need its approval. The second, the Council of the European Union is the main actor in the European Union, as its role inside the organization is the most influential. Both organizations represent the member states, and traditionally have been a stronghold of the intergovernmental side of the EU. Currently both still play a crucial role in the organization, but they are losing ground to other institutions based on federalism or neofunctionalism, like the European Parliament or the European Commission. The future of the Council will mark the future of the Union, and hence it is primordial to reform the institutions to face the new challenges of the XXI century.

Keywords: *European Council, Council of the European Union, European integration, future government of Europe, European institutions, European key actors, decision making in the European Union*

1 INTRODUCTION

There are two institutions representing the member states in the Union, the European Council, where the political heads of the member states are embodied, and the Council of the European Union, where the national ministers in charge of different areas sit together. Obviously, the first institution is more powerful because it is where the Prime Ministers and Presidents meet,

and they are the heads of the national governments, and the ministers normally follow the commands of their governments, but in the working system of the Union the Council of the EU holds, at least nominally, most of the power. (Tsoukalis, 2008)

On the other hand we have a third institution called Council of Europe linked with human rights protections that has nothing to do with the EU. It is an international organization born in Europe but that currently includes many nations of Asia, but its name leads to confusion to who is who in the European Union and in these three institutions.

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2 THE EUROPEAN COUNCIL

Since the creation of the first European Communities, there have been meetings of the heads of governments of the member states to negotiate and develop European integration. At first, these meetings were informal reunions outside the framework of the European institutions, and hence out of the control of the European Communities. It was a faster way to take decisions, without any voting system, just by unanimous agreements. Nevertheless, it was during the presidency of de Gaulle when these meetings became more official, in an attempt to dwarf the European institutions and give a more international character to European integration according to the ideas of the French Premier. De Gaulle pretended to outline the intergovernmental character of the European Communities, and the best way was promoting to the top of the Communitarian pyramid the more intergovernmental option, the European Council, even when it was not still an institution belonging to the organization.

Another French president, Giscard d'Estaing, formalized the meetings of the political leaders of the national governments of the member states of the Communities, and in 1975 the first official meeting was held in Dublin in order to give a political push to the integration in Europe. (Costa-Font, 2012) Nevertheless, the institution was not included in the Union until the Treaty of the Single European Act in the '80s and the Treaty of Maastricht entailed the role of the institution in the Union. Finally, the status of this European institution was included in the Treaty of Lisbon, formally separating the European Council from the Council of the European Union. Nevertheless, it has been the leading force in the Union since the first Community until the present, even if it was not an official institution. The main change with this recognition is related to the voting system, before consensus, and after the Treaty of Lisbon some decisions can be taken by qualified majority, giving more power to supranational Europe and reducing slightly the intergovernmental character of this institution. (Anon, The institution, 2013)

2.1 The power of the European Council

The European Council is the political leader of the Union, and hence it is its main power leading the European integration. It acts as a forum where the member states meet and discuss the next step in integration, the next policy to be included in the treaties, and the further development of existing policies. As the member states hold sovereignty in all national policies outside the Union, they are the ones to decide about sharing the powers given to them by their own citizens with the other members of the organization. The Council will analyze the benefits and the losses of sharing new policies in the context of the Union, and hence push for deeper integration in the fields where they think it is needed. The decisions in the European Council are taken by consensus, and in some cases can be taken by unanimity or qualified majority if the treaties of the Union allow it. The main difference between unanimity and consensus is that in the first there is voting where all the votes have to be positive, and in the second just informal discussion until all the member states agree on any issue.

The development of any new policy in the Union starts in the European Council by consensus; once it is established, the voting system is unanimity until the member states assure that the new policy is working properly; and, afterwards, the European Council passes the decision making to the other European institutions and opens the possibility of a qualified majority voting system. So, the European Council can be considered the motor of the Union, the leading force in terms of deepening integration.

As it is composed of the executive powers of the member states, it has a big influence on different policies of the Union, especially the Common Foreign and Security Policy. It also has some executive power in the Union, appointing some key persons in the Union, such as its own president, the president of the European Commission, the person in charge of the Common Foreign and Security Policy, and the president of the European Central Bank. The influence of the European Council over the Council of the European Union provides it with an important influence over the legislative process in

the Union, even though it is an informal power. (Elgström, 2004)

2.2 Composition

The European Council consists of the heads of state or government of the member states, plus its own president and the president of the European Commission. The latter can attend meetings but cannot take part in voting. His role is mainly to keep in touch with the member states and inform them about the situation of the Union from a European perspective, often different from national opinions. The European Council meets twice every six months, normally in Brussels, convened by its President, but in case of any urgent matter it can have special meetings. Usually in the meetings each state has two representatives, the head of the state or the head of the government, and a national minister if needed. The President of the Commission can also attend the meetings with another member of the Commission.

The president of the European Council chairs the meetings and drives forward its work. He ensures the preparation and continuity of the work of the European Council in cooperation with the President of the Commission, and on the basis of the work of the General Affairs Council. He also endeavors to facilitate cohesion and consensus within the European Council and presents a report to the European Parliament after each of the meetings of the European Council. Moreover he, at his level and in that capacity, ensures the external representation of the Union on issues concerning its Common Foreign and Security Policy, without prejudice to the powers of the High Representative of the Union for Foreign Affairs and Security Policy. (President of the European Council, 2009) The European Council elects its President by a qualified majority for a term of two and a half years, renewable once. He must report to the European Parliament after each European Council meeting, being a link between both European institutions. (Staab, 2013)

The Secretary-General of the Council can also attend the meetings on most occasions, and normally is a key figure in the meetings, because he is a person who has been attending the

meetings of the Council for a long period of time, and his expertise and the experience accumulated by the officials working for him are used to solve conflicts within the European Council. The Secretariat-General of the Council is a body of civil servants constituted to help in the meetings of the European Council, and is divided into different areas, including the most important policies of the Union, such as agriculture or environment. It also has a legal department to give legal advice to the European Council and a private office for internal affairs. (Anon, Hierarchic view, n.d.)

All the heads of state also have different teams made up of national experts, normally national civil servants, who are not members of the European Council staff but play a significant role in the preparation of meetings, discussing with their counterparts and providing information needed to the members of the European Council for their meetings.

2.3 Future

The European Council has been often criticized because of its obscure working system, where most of the decisions are made in private meetings between the member states rather than in the negotiation room. This makes it difficult to understand how and why decisions are taken. Also, the alignment between France and Germany has determined traditionally the direction of European integration, even when currently the relation between Merkel and Hollande is not precisely harmonious. Traditionally if both countries arrived to any meeting of the European Council with a common position adopted prior to the summit, the other countries had much less opportunity to influence the process, and hence the bilateral meetings between France and Germany have been seen as a way of keeping the influence of both states over the Union.

The election of the first president of the European Council pretended to give one face to Europe, ending the rotation system where each member state held the presidency for six months. It was done because with a Union of almost 30 members, each member state would have held the presidency each 15 years, a long period of

time and impractical in terms of efficiency. Nevertheless, there was a big debate about the personality of the new president, whether it should be a strong and influential personality or a grey and docile personality. This discussion was a link with the power of the new position and its relation with the rest of the members of the European Council. As Herman Van Rompuy, from Belgium, was elected, the European Council made it clear that it did not need any leading force besides the member states, and the role of the president is more one of an intermediary between the different positions of the member states than a leading force within the European Council. The problem here is that the president represents the Union internationally, and if his position inside the European Council is weak, he is going to have a low profile in the international arena, weakening the positions of the European Union in world affairs. So it is necessary to give more importance to the presidency in order to secure his international respectability. The future of this organization pass for the fully comunitarization of it spreading the qualified majority voting system and abandoning the unanimity. It will make the organization the real holder of the European sovereignty and the most important institution of the EU, and of the possible future government of Europe as a political body able to decide the major priorities of the Union and control its government acting as a counterbalance to the power of the European Parliament.

3 THE COUNCIL OF THE EUROPEAN UNION

This is one of the most important institutions in the European Union because it is the representative of the member states in the working system of the Union, more involved in practical matters than the European Council, and with an almost omnipresence in the Union. At the beginning of European integration, in the ECSC the Council existed but its power was more limited, with a High Authority being the dominant institution. Nevertheless, the Treaty of Rome established a Council with more power in order to secure the control of the Union and the process of integration to the member states. After the creation of the European Economic Community

the Council became the most powerful institution of the Union, and the key force in the legislative process.

The Council is composed of national ministers, one from each member state. The internal composition depends on the topic discussed, for example if it is agriculture, the 28 national ministers of agriculture go to the meeting; if it is environment, the 28 national ministers in charge of environment in their respective countries go the meeting. In general meetings normally include the foreign affairs ministers of the member states. The Council also has a rotating presidency of six months among the member states according to an established order. It plays a vital part in the organization of the work of the institution, notably as the driving force in the legislative and political decision-making process. (Levitt & Lord, 2000) The president has to organize and chair all meetings and work out compromises capable of resolving difficulties. Mainly he decides the agenda and what the Council is going to discuss.

The decision making in the Council is mainly qualified majority, with some cases where unanimity is required, mainly in the fields where the member states have an important national interest, as Spain with the Cohesion Funds, or France and Germany with the free movement of workers. Nevertheless, the qualified majority is mainly used as a tool to reach a consensus within the Council, because most of the decisions are taken after an agreement among the representatives of the member states. (Glenn & Gordon, 2007)

The qualified majority was an exception at the beginning of European integration in the Council, when unanimity was the common rule, but after each treaty the majority system was spread to the decision making and became the main procedure in the Council little by little. It shows the cautious approach of the Union to this voting system because it means sharing sovereignty among the member states, when one member state can be outvoted and forced to accept a decision of the majority against their national interest, just because it is better for the whole Union. (Kant, 2005) Normally new policies of the Union are decided by unanimity, and once the

main problems have been solved and the member states feel secure and sure about the right working of the policy in the European Union, the voting system can change to qualified majority. (Europa, 2007) It has been a pattern of integration in the whole history of the Union: first the member states want to keep control over newly integrated policies, and afterwards, when the policy is already working well and without major problems, the states transfer control of the policy to the European institutions, mainly the Council and the European Parliament.

Rotating presidency of the Council

2014	First half-year	Greece
	Second half-year	Italy
2013	First half-year	Ireland
	Second half-year	Lithuania
2012	First half-year	Denmark
	Second half-year	Cyprus
2011	First half-year	Hungary
	Second half-year	Poland
2010	First half-year	Spain
	Second half-year	Belgium
2009	First half-year	Czech Republic
	Second half-year	Sweden

Source: (Anon, Presidency websites, 2013)

Distribution of votes for each Member State in the Council of the EU

Germany, France, Italy, United Kingdom	29
Spain, Poland	27
Romania	14
Netherlands	13
Belgium, Czech Republic, Greece, Hungary, Portugal	12
Austria, Bulgaria, Sweden	10
Denmark, Ireland, Lithuania, Slovakia, Finland	7
Cyprus, Estonia, Latvia, Luxembourg, Slovenia	4
Malta	3
TOTAL	345

Source: (Anon, Council, n.d.)

The qualified majority has had many different shapes since the Treaty of Rome in the '50s, and currently under the Treaty of Lisbon there is a weighting of the votes that each member state holds, plus a system of double majority. The distribution of the votes for each member state depends on different matters, as population or economic power, but in contrast with the EP, there is equality between the main countries of the Union, Germany, France, Italy and the United Kingdom. Basically the unwritten rule of equality between France and Germany, as the motor of the Union, has been respected here. The maximum number of votes for each member state was established at 29, and hence no state will have more than this amount. Also, member states have to cast their votes in bloc. It means that a member state may not split its votes and hence, the number of votes rather describes the weight of a member's single vote.

The double majority system is based on the majority of the votes in the Council plus:

1. A majority of the member states. If the proposal comes from the European Commission, a minimum of 55% of the member states is required. If the proposal comes by a different path, the percentage increases to 72% of the member states. This is clearly a measure to protect the medium and smaller member states that could be outvoted by an alliance of the big countries, and hence forced to accept something against their will. If the proposal comes from the Commission, it means it comes from an institution whose interest is Europe and has no major influence from the member states, and hence the majority percentage of the states is not as high as if the proposal comes from a member state, for example.
2. A majority of the European population. If some member states representing at least 62% of the European population are against any proposal, even if the proposal has been back by the majority of the Council, the measure will not be adopted. It is an action to protect the big countries from being outvoted in the Union, and avoiding a situation where the majority of the member states representing a minority of the

European population could decide the future of the Union. (EU, 2007)

In addition to these main conditions, there are minority block systems, where the power of the big member states is bigger. Nevertheless, as has been said before, the normal procedure of the Council is based on agreements and consensus among the member states, and the voting system is basically used to force the consensus or, in exceptional cases, when a member state does not want to reach an agreement. For example in 2008, 128 out of 147 Council decisions were unanimous. (Ramiro Troitino, 2013)

3.1 Working system in the Council

The Council depends mainly on the work of the national civil servants to get the information needed to adopt decisions. At the beginning of the process, the member states meet in different working groups for an early discussion. The working groups are formed by national civil servants who are specialists on the topic being discussed; for example, in justice, high ranking national civil servants of the national ministries of Justice will meet in accordance with the sphere of their work. (Anon, Working groups of the Council of the European Union, 2008) The working groups discuss mainly the proposals of the European Commission, but they can also meet if the Council requires it because of other reasons. Mainly the work at this level is more technical, and the different representatives from each member state give their opinions and work together in order to achieve a common position. They make reports when the working groups agree on any issue or find problems to discuss further. In any case, they pass their report to the COREPER, or committee of permanent representatives. If the working group agrees on a common position, normally the COREPER just agrees on it also, but if the working groups find any problem, further discussion will be done in the COREPER.

This early stage of the discussion is very important because it influences further agreements and discussion within the Council, and here is where the influence of the bigger states can be felt more, because normally the

bigger states have more civil servants and experts than smaller states, and hence can influence the discussion more. It is obvious that the capacity of a country like Germany in terms of experts and civil servants is much higher than the capacity of a state like Malta, where there are not experts in all the fields discussed in the Council and their expertise is normally lower.

The COREPER is the permanent representative of the member states in the European Union; the main mission of the COREPER is to prepare the agenda of the meetings of the Council and oversee and coordinate the work of the working groups. It is divided into two main committees, COREPER I, where the deputy heads of the national missions meet to discuss mainly social and economic issues, employment, social policy, health and consumer affairs, competitiveness, transport, telecommunications and energy, agriculture and fisheries, environment and education, and youth and culture. COREPER II is where the heads of the national missions with the rank of ambassadors meet to discuss mainly political issues, but it also includes financial and foreign policy issues.

The COREPER obtains the information from the working groups and normally takes decisions without debate if there was already agreement in the working groups. If the working groups send a report to the COREPER where some problems were not solved, the COREPER holds debate and tries to reach agreement. After the COREPER makes its own reports on the issues discussed, it sends them to the Council for the ministers to approve them or for further discussion at a higher level. It makes three different proposals for the agenda of the Council:

1. I. Points: Information for the ministers that does not need any decision.
2. A. Points: These are the proposals where an agreement has been reached in the COREPER and there is no necessity of further debate in the Council, and normally the Council just approves them.
3. B. Points: No agreement has been reached in the COREPER and the issue is sent to the Council for further discussion. The Council will negotiate until they reach an

agreement. Normally these are sensitive issues for some member states, important for their national interest, where they try to get the best conditions for their respective states.

The Council in its highest expression, the meetings of the ministers, normally deals just with a few problematic but important issues, because normally there has been agreement in the working groups or in the COREPER, and hence the Council can focus on the most important proposals for their own states, mostly in a political sphere. (Anon, Hierarchic view, n.d.)

3.2 Secretary of the Council

This is a service from the Union to assist different European institutions, as the Council of the European Union, the Council Presidency, the European Council, and the President of the European Council. It is composed of around 3,500 civil servants, and comprises a legal service, eight directorates-general, and a private office split between departments answering directly to the Secretary-General of the Council and the High Representative for the CFSP and departments answering to the Deputy Secretary-General. (Anon, The High Representative of the Union for Foreign Affairs and Security Policy, 2009) Since the Treaty of Lisbon the Council decides on the organization of the General Secretariat by a simple majority. (Grahm, 2009) Its main tasks are:

- Organize and coordinate Council work
- Legal advice
- Political advice to the presidency

The person holding the General Secretariat is an important part of the Council because it has had presence in the meetings for a long period of time, far from the temporal assistance of the national ministers that depends on the national elections, and hence can provide a wider perspective in discussions in order to unblock the complicated debates. It also can advise the ministers in solving different situations using the experience gained in previous discussions, giving examples to the Council about similar problems in the past and how these situations were solved.

3.3 Council headquarters

The Council is in a situation similar to that of the European Parliament, with different locations as the consequence of the previous Communities and European treaties, but its main seat is located in Brussels. Most of the services of the Council, as well as the General Secretariat, are also located in Brussels. Nevertheless, as the Council of the ECSC was located in Luxembourg, it was decided that the meetings of the Council during the months of April, June, and October are to be held in Luxembourg. The location of Brussels was decided upon after the merger of the existing communities because the European Commission and some parts of the European Parliament were located in Belgium, and hence communication between the European institutions would be easier if they were located in the same place. This logical decision was denied to the European Parliament, which still has some offices in Luxembourg. The Council extraordinary can also have its meetings in its higher form in other cities, but only under extraordinary circumstances.

3.4 The power of the Council

The Council acts mainly in three fields: Foreign Affairs, where it is the central institution, Legislative Procedure, and Budgetary Authority, where it shares control with the European Parliament. (Rodríguez-Pose, 2002)

The role of the Council in foreign affairs is crucial, and it is the major European institution in this field. (Ahearne, Pisani-Ferry, Sapir, & Véron, 2006) The decisions here are mainly taken by consensus or unanimity, because the external interests of the member states are different and often a common agreement is very difficult. Anyway, the decision to adopt any measure related to the CFSP is taken in the Council. It also has a High Representative of the Union for Foreign Affairs and Security Policy. This post combines three functions: the EU's representative for the CFSP, the President of the Foreign Affairs Council, and a Vice-President of the Commission. At the moment, this post is held by Catherine Ashton. (Anon, The Common Foreign and Security Policy (CFSP), n.d.) Her designation was controversial because she is a

low profile politician with no political stature. It means tighter control by the Council over this newly created position. If the Council would have wanted a strong CFSP, a strong position in the external world, it would have chosen a candidate with more experience and greater initiative.

The legislative power of the Council is mainly shared with the European Parliament via the co-decision system, where both institutions need to agree in order to adopt new legislation for the Union, and this works in most of the European policies. Anyway, there are some areas with different procedures where the Council holds the responsibility for approving new legislation. Mainly these are areas where the member states are afraid of losing control, as justice and home affairs or fiscal aspects of other policies. Here the Council decides about the new legislation according to its internal rules. Both procedures make the adoption of new legislation in the European Union impossible without the consent of the Council, and hence without the consent of the member states, making the Council a central institution in the context of European integration. (McKay, 1999)

The budgetary authority of the Council is also very important, but has decreased over the years. Previously, the Council had control over the most important chapter of the budget, the money dedicated for the obligations of the Union, and it shared budgetary power with the Parliament in the rest of the chapters, but these limitations have been erased and now the Council and the Parliament stand equally in negotiations for the EU budget. (Pisani-Ferry, 2005) If both institutions are not able to reach agreement, there is a conciliation committee where this can be discussed further. It works in a way similar to the co-decision system. In addition to the budget, the Council coordinates the economic policy of the member states of the Union. (Crafts, 2008)

3.5 Future

The Council of the EU is losing ground to other institutions inside the European Union, but still is clearly the most important institution in terms on political power and decision making. From one side, the political power is moving away to the

European Council, the representation of the heads of the member states. It is a natural consequence of the most active role of the European Council in the European Union affairs. The clearly definition of the functions of the European Council in the Treaty of Lisbon has decrease the power of the Council of the EU. Nevertheless it is a logic movement that more political power is in the hands of the Head of the member states, as they represent the national governments elected in national elections, and hence they hold the national sovereignty and have the capacity to share this sovereignty in the European level.

On the other side, the European Parliament is becoming more important in the decision making of the European Union with innovations and expansion of different systems, as the Co-decision system, where the EP and the Council of the EU stand in equal terms in more and more policies. As the European building process has been developed with deeper integration, there has been a growing necessity to link the process with the European people in order to give a democratic approach to the European Union. (Kerikmäe & Nyman-Metcalf, 2011) The European Parliament is the institutions representing the European people, and hence its power is growing and the power of the Council of the EU is decreasing at the same time.

The future of the Council of the EU does not look like bright in this process which is weakening the institution treaty after treaty, and hence it might become and empty institution with very limited power unless a big reform in the institutional framework of the European Union is done establishing new competences to the current institutions. (Gnesotto & Grevi, 2006)

4 CONCLUSIONS

The European Council, the representation of the head of the governments of the member states of the European Union, is the political leader of the Union and it is an institution called to become the leading forcer inside the EU. Traditionally it played a more modest role directing the integration from the darkness of secret agreements between governments without any voting system, working through consensus,

agreements between gentlemen. It was in reality holding the power but letting other European institution to represent its interest, the Council of the EU. Currently the European Union is needed of a stronger political leadership, as the integration is opening to political fields, before just in the hands of the national states.

On the other hand, the Council of the EU is reducing its muscle in the European Institutions as the necessity of democracy is improving the powers of the European Parliament. The subordination to the European Council, the subordination of the national ministers to the head of their national governments, is clear, but has not been plainly established in the European Union. It is mainly a consequence of the view of some member states of the European Union as an intergovernmental organization without any integration in real political matters and focus on economic issues, and hence there was no necessity to involved politics in the European institutions, just the ministers in order to negotiate the technical questions of elaborating common rules for economical transactions between economic agents of the member states. (Krugman, Obstfeld, & Melitz, 2011)

The recent changes in the Union and the most probably new changes expected in the coming years are developing the Union closer to a political structure with important involvement of areas strongly link with the popular sovereignty. In other words, European Union is becoming more political and hence should have more political control from the member states in order to provide democratic legitimacy to the whole process. (Glenn & Gordon, 2007)

Taking into consideration the already existing links between both Councils, the necessities of both institutions and the future development of

the European Union, the most logical reform to secure this fundamental institution in the European Union will be the formal merge of the Council of the EU and the European Council. The creation of a single institution, with the formal heads of the state leading it, and the ministers working formally under their command will clarify the institutional framework of the Union, and will help to establish strong borders between different institutions. It will recognize who really holds the power in the Councils, and will make more powerful the situation of the Council of the European Union, currently under a strong pressure. Uniting both institutions will make stronger the voice of the member states in the EU, the intergovernmental side of the EU. In the coming years a balance between intergovernmentalism and federalism (Neal & Barbezat, 1998) will be require in order to adapt the European Union to the international and domestic challenges and necessities it is facing, and will face.

Europe cannot be built at once, and because if that it really needs the positive involvement of as many political, economic and actors as possible. A strong single Council will balance the power of a growing European Parliament, which sometimes tries to go ahead of the will of the European people. This equilibrium between options, between priorities, between necessities can be achieved just through negotiations and agreements satisfying the actors involved in the process. The best way to obtain it is providing the actors with strong forums or vehicles where to develop their positions and launch the negotiations, providing the actors involved with strong institutions. Hence, the creation of a single Council is an essential step for the good working of the European Union for the coming years.

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MULTICRITERIA DECISION SUPPORT- APPROACH AND APPLICATION IN THE FIELD OF MATERIALS SCIENCE

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Abstract

The research will focus on creating opportunities for prediction of mechanical properties as a function of the chemical composition and the heat treatment parameters taking into account the appropriate boundary conditions.

The solutions for predicting properties as a function of the composition and the processing parameters are defined for specific customer requirements. This is accomplished by numerical procedures that determine the optimal composition for a number of criteria with established advantages for the significance of the results. The accuracy of the solution is determined by the reliability of the used experimental data. The actuality of the research of predicting the properties of materials is determined by the fact that the established models are based on computer simulation for building contemporary design tools. The practical results are applicable and they can be used for: a) the design of more efficient compositions in terms of the expensive alloying elements while maintaining the basic properties above a given threshold, b) evaluation of the technological cost of equally applicable technological variants of varying degrees of doping steel, c) determination of a rational representative of a certain class of materials best suited to the requirements previously set (most often controlled properties) among the rest of the class.

Keywords: metallic materials, ferrous alloys, modeling and optimization properties, DSS, multi-criteria decision analysis

1 INTRODUCTION

Engineers and experts that implement their projects, they need to use modern approaches to in order to choose materials and design process of the product. With their scientific and practical

work they have to enable the responses to a range of issues related to the modeling and optimization of steel and their technological processes of transformation. As a result of the great number of significant factors, the idea for the application of multicriterial decision support systems is imposed.

Theoretical and practical aspects of multicriterial decision support systems were analyzed by

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various researchers as (Colson, 2000), (Purao, Jain, & Nazareth, 1999), (Sen, Tan, & Spencer, 1999). (Zavadskas, 2004) In the area of material sciences, multicriteria decision support approach was used in the last decades in problems of material composition (Tontchev & Ivanov, 2006), production (Brito, Silva, Botter, & Medina, 2010), recycling (Spengler, Geldermann, Haehre, Sieverdingbeck, & Rentz, 1998), as well as in cost optimization (Sarma & Adeli, 2000), and design (Gedig & Stiemer, 2006).

In the field of materials science, the processes of changing the structure and the properties of various materials are analyzed. These analyses are driven by the goal to get and accumulate knowledge about them. They define the field of application of appropriate technologies and materials. The emphasis in the process of testing is put on different characteristics of quality, requirements for providing, such as:

- high strength (static and/or dynamic),
- stiffness (E-modulus) and toughness (the material/product);
- high wear resistance and hardness;
- good workability;
- high temperature resistance;
- appropriate cost;
- environmental compatibility and recyclability.

Due to contradictory nature of the properties of metallic materials, optimization tasks do not meet the expected extremes in the same coordinates of the control parameters. The confrontation between the different criteria leads to the formulation of multi-objective problems. They are characterized by the fact that they do not have a single solution. For the solutions of the problem it is necessary to find the Pareto front after which the Decision Maker (DM) must determine good solution for the composition of the alloy and also for its mode of processing. The formulated criteria are directly related to: high performance (functionality) and quality (structural and operational characteristics), as well as high economic efficiency.

An increased requirement for quality production of materials also implies the need to use advanced tools for analysis and modeling. The automated design of compositions and modes of treatment is possible to implement with modern computing facilities.

The development of methods and software support the design of configurations and the modes of the alloy treatments. The requirements for the materials, already mentioned as confronted with the properties and behavior under real operating conditions, however, are not fully identified.

By multicriteria optimization it is possible to reach a compromise between the conflicting characteristics of the trend change. Pareto-optimal solution (according Pareto-optimal management) has the following property: any deviation from it in order to improve one or more criteria leads to a deterioration of at least one or more of the other criteria.

In Bulgaria, modeling and optimization of technological processes has begun its development from the early eighties of the previous century. Most of all were developed methods for processes modeling in the fields of chemical engineering, metallurgy and casting, etc. ((Novik & Arsov, 1981), (Stoyanov, 1993), (Vuchkov & Stoyanov, 1980), (Vuchkov I. , 1984), (Djonov, Angelov, & Petrov, 1995)).

Generalized representative results about the achievements in the field of optimization of technological processes are presented in Tellalyan's PhD thesis (Methods and algorithms for optimization of processes with complex objective functions, 1985), Stoyanov's dissertation (Methods and algorithms for fast convergence, 1990), and Vuchkov (Experimental investigation and identification, 1990).

The purpose of this work is to propose an approach with operational capabilities enhancing and specifically enhancing the reliability of alloy steels from a given class, using the technique of modeling the properties via the composition and the mode of processing. The suggested approach, developed at the level of methodology, must be also transferred to the related technological cost of blanks used in metalworking.

The achievement of the objective of this work should include solutions for the following main problems:

- Creation of a nonlinear analytical model to control the properties of steels depending on the chemical composition in the heat-treated condition. This means a research of the

possibility to predict properties of the blank using regression analysis tools. For this purpose it is necessary to create a procedure and also software for analysis of the studied parameters;

- Preparation of some of the achieved, practically oriented results for implementation in industry.

2 ADAPTATION OF THE METHOD IN HANDLING THRUST CONSTRAINTS FOR MULTICRITERIA OPTIMIZATION

The main steps in solving the problem of design and optimization, which are applicable for material selection and design of technology for processing, are as follows:

1. Defining of a set of properties and determining the interconnections between the elements of the generalized multicriteria model;

2. Collecting and processing the available information (quantitative and qualitative);
3. Determination of the control parameters, the variation, which leads to substantial modification of the parameters of quality (the criteria);
4. Formulation of the problem of system management for the material selection and the processing mode;
5. Creation of a set of models defining the relationship between the control parameters and the criteria of quality;
6. Solving the multicriteria optimization problem and decision making for the design process.

Fig. 1 shows a sample surface in response to a modification of the indicator of quality, depending on the value of inputs' parameters.

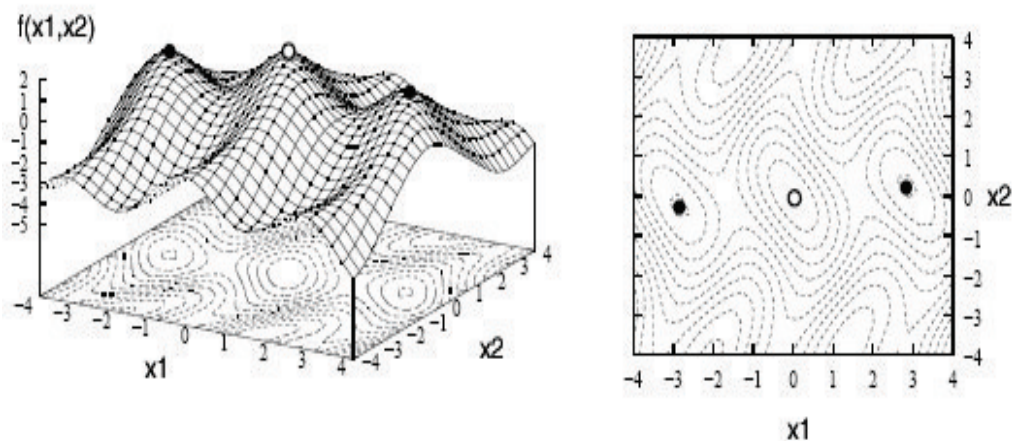


Fig.1 Graphic interpretation of a single-criteria optimization problem with two factors of variation

It is accepted that such surfaces must be analyzed graphically by contour diagrams defined by equilevel lines (the lines of constant levels). Thus it is possible graphically to define the coordinates of the values of the process parameters, which occur in local or global maxima and minima of the target parameter.

In order to proceed with this analysis, it is necessary to perform a discretization of the variables in the plane of the process parameters. Discretization is performed in the range of variation for each variable with a definite step. The accuracy of the defined solutions depends on the step size.

Fig.2 shows an exemplary discretization 10x10 in the plane of the control parameters.

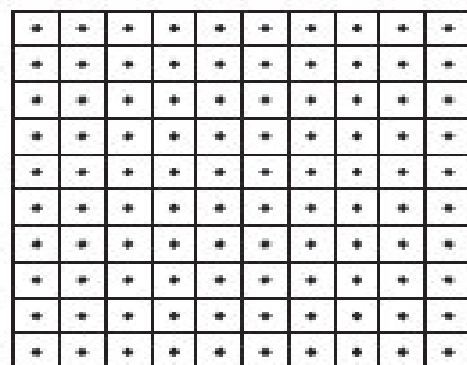


Fig. 2 Arrangement of a 10x10 sample in the plane of variables

Organization of discretization in the vicinity of the cell $[i, j]$ may be carried out as follows:

i-1, j+1	i, j+1	i+1, j+1
i-1, j	i, j	i+1, j
i-1, j-1	i, j-1	i+1, j-1

For the implemented discretization it is possible to calculate the values of the quality indicators, so through this sequence a discrete contour plot is constructed. The tool, which crawls through the discrete plane of technology parameters, is called a "magnifying glass". The movement of the magnifying glass in the plane of the process parameters determines the relationship between them and the value of the studied parameter of the quality tests.

Digitized contour diagrams can be represented in a convenient, user-friendly, form of the decision maker. The performance is related to staining in different colors for different areas, bounded by the contour lines. Different colors are projected in the plane of analysis by scanning the surface of

the response to multiple (up to six) planes. An essential feature of this presentation is the different range of variation for certain values of the target parameter. Therefore, the geometric representation of the digitized image will depend on the location of the plains along the axis of criteria (indicators of quality). The corresponding color on the discrete contour plot is directly related to the value of the indicator of the quality.

Fig. 3 presents a discrete contour diagram of an example of the surface for the parameter of quality with five scanning, restrictive, planes in respective colors with two factors of variation. If the first, the second and the third planes occupy the location of the fourth, then the image will be simplified (the discrete contour plot will be only in two colors), thus localizing the area of the solutions to the area is marked by five. This procedure is performed in the case that there is a search of the maximal values of the goal function.

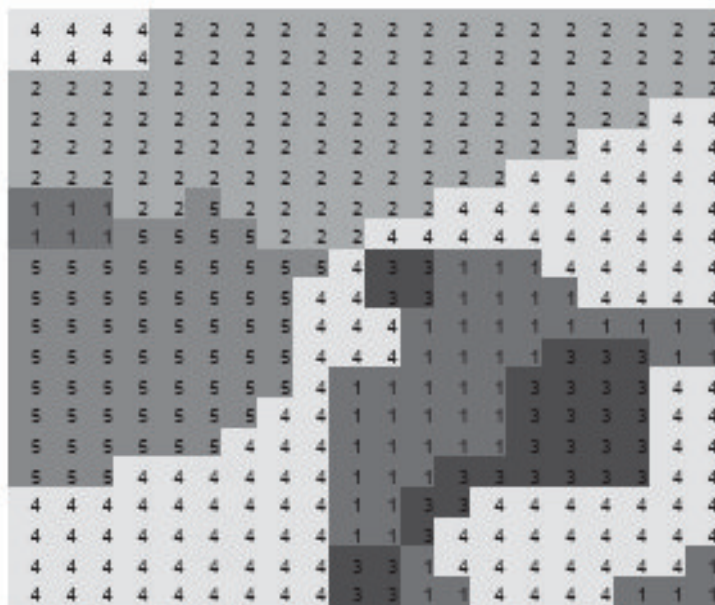


Fig. 3 Example of two-dimensional discrete contour plot with five scanning planes

The values of the examined parameter in zone five differ in size. The fixed area defined already from the fifth plane can therefore be scanned again for example by four planes – an act leading to the localization of the maximum / minimum also by the described procedure. So, moving the five planes, the decision maker can analyze the goal function in the plane of analysis and he/she can recommend a combination of control parameters. This graphical approach is adapted for solving problems for analysis and optimization

in the field of materials science to four factors of change.

An exemplary presentation of images supporting the analysis of the four-factor space for two successive iterations is shown also in Fig. 4.

The image is defined on one side by means of the coefficients of the regression model, and on the other by the level of the thrusting constraints. To carry out an analysis by color arrangement it is necessary to normalize the value of the goal parameter in the space of the analysis.

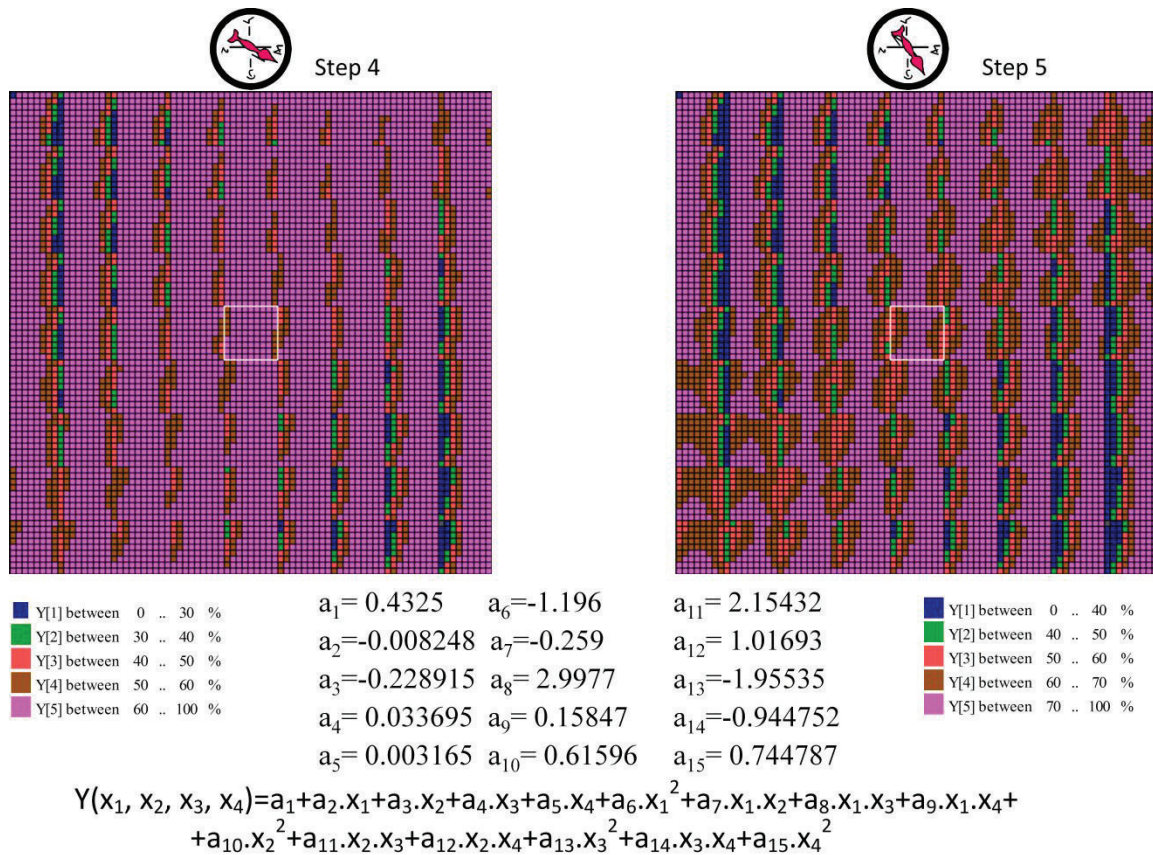


Fig.4 Images for analysis of four-factorial space of the described regression model

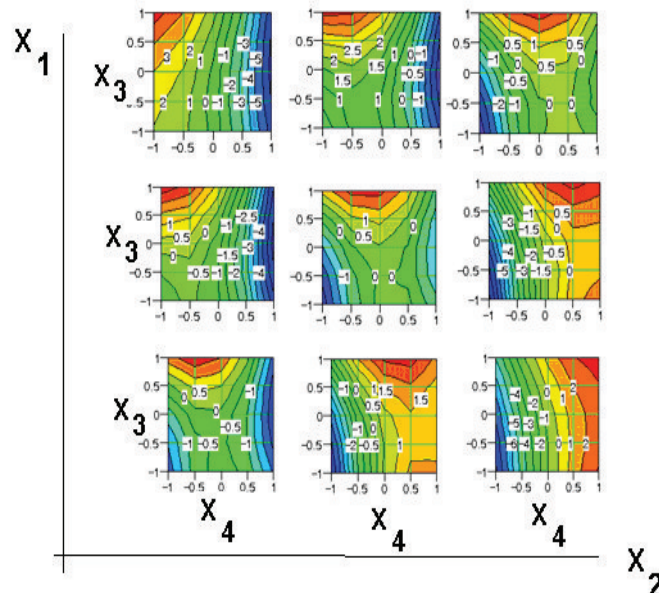


Fig.5 Presentation of the four factors MCAD space without normalizing the values of the target parameter

Fig. 5 shows an image of the model from Fig.4, realized with MCAD; the steps X_1 and X_2 are equal to 1 each, and X_3 and X_4 to -0.5 in the range of [1,1] for the four variables.

The analysis together with the normalization and the thrusting constraints makes it easy to determine the combination of control parameters, where the index of quality accepts a precisely defined value.

One example in this respect is shown in Fig. 6 where the research value in the range between 80-81% is marked with the appropriate color (green) encountered in the field for analysis.

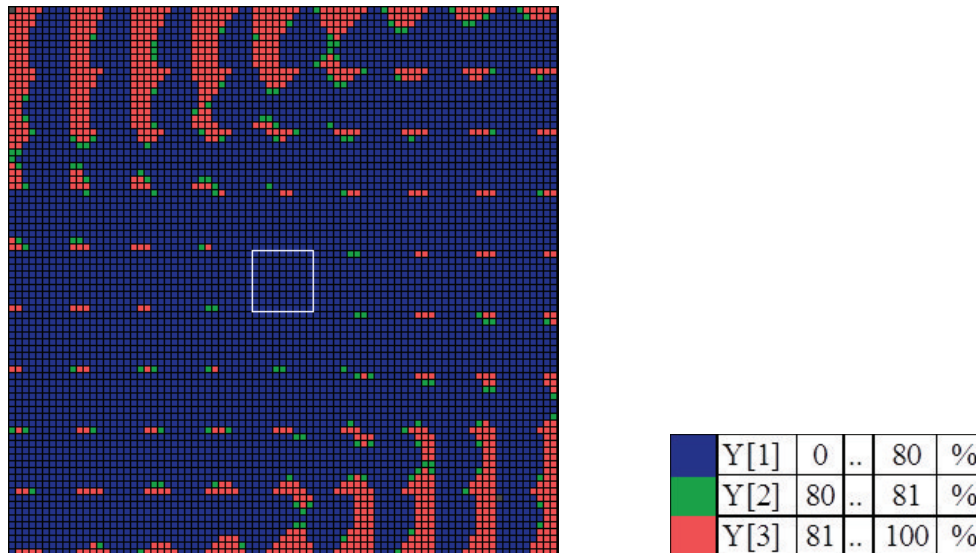


Fig.6 Presentation of the approach as a means for determination of effective solutions for analysis of a single goal parameter

If the value in this range satisfies the person assisting the decision making in the case (as seen from fig.6), he/she has a wide selection to determine a more energy-efficient solution. The reason for this is that the decisions of the research space are spread almost all over the area. These fixed solutions have different changes also from an economic aspect.

Another feature of the approach with normalization and thrusting constraints is to determine the search direction. The second largest area, displayed on Fig. 6, represents the values above 81%.

3 APPLICATION OF MULTICRITERIA APPROACH FOR THE SELECTION OF MATERIALS AND THE MODE OF TREATMENT FROM A CLASS OF HEAT RESISTANT STEELS

Operational durability, reliability and competitiveness of industrial products depend on the used materials and also on the applied various (mechanical, physical, chemical, etc.) impacts on them. Especially significant contribution to the achievement of the required quality of the parts and the equipment belongs to the preliminary and the final heat treatment and

chemical-thermal processing. Pre-heat treatment before nitriding aims at achieving certain mechanical properties of the core (strength, hardness, toughness), minimal internal stresses, enhanced successive mechanical processing, small grains and other properties (heat resistance, structural homogeneity, etc.). Only after properly selected and conducted preliminary heat treatment nitrided layer can reach its best characteristics – hardness, wear resistance, fatigue strength, heat resistance, high resistance against brittle fracture, etc. Also in this case the optimal values of the target parameters are obtained by different combinations of the input parameters, so in the process of optimization practically it is impossible to perform a simultaneous maximization of all output parameters.

Here will be illustrated the approach in determining the steel grade and the mode for its treatment, providing the highest lifetime operational durability, and taking into account the energy consumption of the technology. The methodology for saving energy and/or materials is based on multicriteria optimization using regression models describing the dependence on

the mechanical properties of the parameters of the nitriding mode. It is based on the principle that multicriteria problem has to be solved first. The result is a set of close Pareto vectors differing one from another energetically or in relation to the amounts of expensive alloying components. Energetically the most favorable, or material-effective solution is prescribed after the verification of the energy consumption and/or the material consumption.

The example set of steels for research are typical representatives of alloy(ed) tool steels for operation in hot environments and in this role it is very important for the users to identify modes of

thermal and chemical-thermal treatments that simultaneously ensure relatively best micro hardness, toughness of destruction and durability. Table 1 contains the chemical composition of steels of this type. Table 2 shows their basic strength and plastic characteristics.

The necessary factors for the realization of an optimization problem are the following:

3.1 Object for optimization.

For the example the object for optimization are the properties of tool steels for hot working (micro hardness, toughness of destruction and wear resistance) in the process of ion nitriding.

Table 1 Chemical composition of steel from the class of scope, [%](GOST, Tool steel, 2010)

Steel	C	Si	Mn	Cr	Mo	W	V
4H5MFS	0.32 - 0.4	0.9 - 1.2	0.2 - 0.5	4.5 - 5.5	1.2 - 1.5	–	0.3 - 0.5
3H3M3F	0.27 - 0.34	0.1 - 0.4	0.2 - 0.5	2.8 - 3.5	2.5 - 3.0	–	0.4 - 0.6
3H2V8F	0.3 - 0.4	0.15 - 0.4	0.15 - 0.4	2.2 - 2.7	Up to 0.5	7.5- 8.5	0.2 - 0.5

Table 2 Characteristics of the steels in scope (GOST, 2007-2013)

Steel	Yield strength	Tensile strength	Elongation	Contraction	Impact strength
	Rm [MPa]	Re [MPa]	A [%]	Z [%]	KCU [kJ/m ²]
4H5MFS	1750	1480	–	–	570
3H3M3F	1670	1470	–	50	220
3H2V8F	1530	1390	12	36	200

3.2 Manageability of the object

In order to ensure the management of the object, there must be control parameters (degrees of freedom) that are being modified independently from each other. Table 3 indicated the range of variation of the ruling parameters for the mode of thermal and chemicothermal processing. With the variation of the technological factors on the process a planned experiment is run which resulted in the output models checked for adequacy. Zyumbilev's dissertation (Effect of low temperature plasma nitriding on the properties of tool steels for hot working, 1992) has defined the relationship between the goal parameters and the technological factors of the modes for processing.

To determine the nitriding modes there have been used mathematical and statistical methods of the planned experiment. A characteristic of this approach is that a compulsory change of input factors is performed within certain limits. Minimum number of trials and simultaneous adjusting of all factors is used. The main problem is reduced to determining the mathematical form of the research, which can be expressed in the given process.

Based on bibliography data and preliminary experiments, the following input (control) factors are defined in Zyumbilev A. (1992): the nitriding temperature, the pressure, the duration of the process, and the temperature of tempering. The

following requirements are satisfied during the selection of these factors: independence from each other, compatibility between them and the ability to drive them.

Table 3 Variation range of the input parameters

Factors	T_{az} [°C]	P [Pa]	τ [h]	$T_{otvr.}$ [°C]
Levels X	X_1	X_2	X_3	X_4
Zero level (0)	530	300	7	650
Interval of variation	20	150	3	50
Upper level (+I)	550	450	10	700
Lower level (-I)	510	150	4	600

Based on the influence of various factors on the nitriding and the objectives pursued, the following parameters were selected for optimization (matching factors): maximal micro-hardness of the layer $H_{\mu V}$, relative degree of wear K_v and toughness of destruction K_{1c} (K_q).

Selected in this way, the factors and intervals are used to design experiments also on the basis of a plan of the various combinations of processing-mode parameters with which the experiments were conducted. In order to reduce the errors it is recommended that every attempt is done twice and the combinations of zero-level factors five times. All samples were ion nitrided in an installation of type ION-20 (Anon, 2013). The impregnation gas during nitriding in glow discharge was gaseous ammonia. After nitriding the samples were cooled in air. About ion nitriding is written in many papers, e.g. (Čekerevac, 1982) or (Kopelovich, 2012)

3.3 Criterion for optimality

This is a numerical index which values the object of optimization. It may be technical, technological, economic, and mixed technoeconomic. For the defined example, the criteria

for optimality are technological and technoeconomic. The best value on the criterion of optimality is called optimum or extreme. In this example, it is necessary to determine the technological parameters, thermal and chemical-thermal processing providing simultaneous maximal micro-hardness and toughness of destruction and minimal wear.

3.4 Optimization method.

It is the most important prerequisite for the solution of optimization problems, because it reflects the principled nature of the search process for the best result regardless of the character of the object for optimization and the set goal.

The choice of a particular method is determined by requirements and by the nature of the object and also by the correct definition of the optimization problem.

In the example the criterion of optimality for technological objects is expressed with three objective functions. The optimization problem boils down to monocriterial, which needs an appropriate algorithm. In principle, the optimization is carried out under direct experimentation with the object of the scheme: control action – the result – a new control action. In practice, however, the optimization research is carried out with the object or the system represented by a mathematical model.

Mathematical models allow numerical experiments for the most economical research of the influence of the control parameters on the performance of the existing system or the criterion of efficiency of design.

For this example, below is given the relation between the technological factors and the goal examples. Their methodologies are given in Zyumbilev A.(1992).

For steel **4H5MFS**

$$HV_{0.1} = 11914.4 + 254.13X_1 - 143.65X_2 + 134.44X_3 - 274.03X_4 - 51.50X_1^2 + 248.75X_1X_2 - 88.75X_1X_3 - 136.25X_1X_4 - 624.00X_2^2 - 301.25X_2X_3 + 76.25X_2X_4 + 194.00X_3^2 - 36.25X_3X_4 - 144.00X_4^2 \quad (1)$$

$$K_q = Y_4 = 83.2 - 1.52X_1 + 5.3X_2 + 3.77X_3 + 1.89X_4 - 3.75X_{12} + 4.63X_1X_2 - 4.00X_2^2 - 3.5X_4^2 \quad (2)$$

$$K_v = 0.4020 - 0.0828X_1 + 0.0033X_2 - 0.0523X_3 - 0.0008X_4 + 0.0037X_1^2 + 0.0106X_1X_2 + 0.0244X_1X_3 - 0.0006X_1X_4 + 0.0087X_2^2 - 0.0469X_2X_3 + 0.0031X_2X_4 + 0.0237X_3 + 0.0093X_3X_4 + 0.0512X_4^2 \quad (3)$$

For steel **ZHZMF**

$$HV_{0.1} = 11527.2 - 129.5X_1 + 150.41X_2 - 292.02X_4 + 87.50X_1X_2 - 62.50X_1X_3 - 75X_2X_3 - 137.50X_2X_4 - 234.5X_3^2 - 137.50X_3X_4 - 194.50X_4^2 \quad (4)$$

$$K_Q = Y_8 = 74.76 - 2.24X_1 - 1.76X_2 - 0.52X_3 + 19.06X_4 - 16.1X_1^2 + 2.13X_1X_2 - 2.5X_1X_3 - X_1X_4 - 17.35X_2^2 + 1.25X_2X_3 - 2.25X_2X_4 + 14.65X_3^2 + 0.88X_3X_4 - 8.85X_4^2 \quad (5)$$

$$K_V = 0.3898 - 0.0786X_1 - 0.0099X_2 - 0.0494X_3 + 0.0151X_4 + 0.0307X_1^2 + 0.0131X_1X_2 + 0.0044X_1X_3 + 0.0157X_1X_4 + 0.0257X_2^2 - 0.0494X_2X_3 + 0.0243X_2X_4 + 0.0107X_3^2 - 0.0218X_3X_4 + 0.0457X_4^2 \quad (6)$$

For steel **ZH2V8F**

$$HV_{0.1} = 11074.8 - 92.33X_2 + 97.99X_3 - 514.46X_4 + 117.00X_1^2 + 86.25X_1X_3 + 311.25X_1X_4 - 93.00X_2^2 - 273.75X_2X_3 - 173.75X_3X_4 - 85.50X_4^2 \quad (7)$$

$$K_Q = Y_{12} = 40.52 - 9.3X_1 - 1.8X_2 - 3.49X_3 + 13.49X_4 - 2.7X_1^2 + 0.625X_1X_2 - 5.25X_1X_4 - 2.20X_2^2 + 0.125X_2X_3 - 2.95X_3^2 - 3.38X_3X_4 + 13.05X_4^2 \quad (8)$$

$$K_V = Y_{14} = 0.3804 - 0.0804X_1 - 0.0076X_2 - 0.0504X_3 + 0.0300X_4 + 0.0156X_1^2 + 0.0050X_1X_2 - 0.0025X_1X_3 + 0.0037X_1X_4 + 0.385X_2^2 - 0.054X_2X_4 - 0.029X_3^2 - 0.037X_3X_4 + 0.059X_4^2 \quad (9)$$

The set of points satisfying the constraints is called the set of acceptable solutions for the goal function $Q(x)$ or, for brevity, the eligible area.

The algorithm for solving the optimization problem is a sequence of logical and computational actions that achieve the best

result under these conditions. The most important requirements for the algorithms are the ones for convergence and versatility.

In this approach, the following results have been obtained for the mechanical properties of the investigated steels in appropriate modes of processing.

Table 4 Optimal values of the input and output parameters

Parameters	4H5MFS		ZH3M3F			ZH2V8F	
	#1	#2 ≡ #3	#1	#2	#3	#1	#2 ≡ #3
X_1	0.5	1	- 0.25	0.25	0	- 1	- 1
X_2	0.25	0.25	0.0	0.5	0.5	- 0.25	- 0.25
X_3	0.75	0.75	0.25	1	1	0	1
X_4	- 0.5	- 0.25	0	- 0.25	- 0.25	- 1	- 1
Hv	12060	12110	11550	11410	11440	11950	12200
K_Q	84.16	82.29	75.25	77.18	79.04	41.89	38.80
K_V	0.348	0.312	0.399	0.313	0.329	0.523	0.483

The results listed in Table 4 are derived for coded values of the factors due to the fact that they are determined by the regression models in this way. The values of the target parameters in the Table 4 can be normalized respectively to the smallest and largest values of the considered feature of the class.

As this normalization is common for the three steels and through it, it is possible to range the optimal values of the parameters. This is implemented in Fig. 7. According to the realized ranking it is possible to determine the final decision at the same time with the three goal parameters.

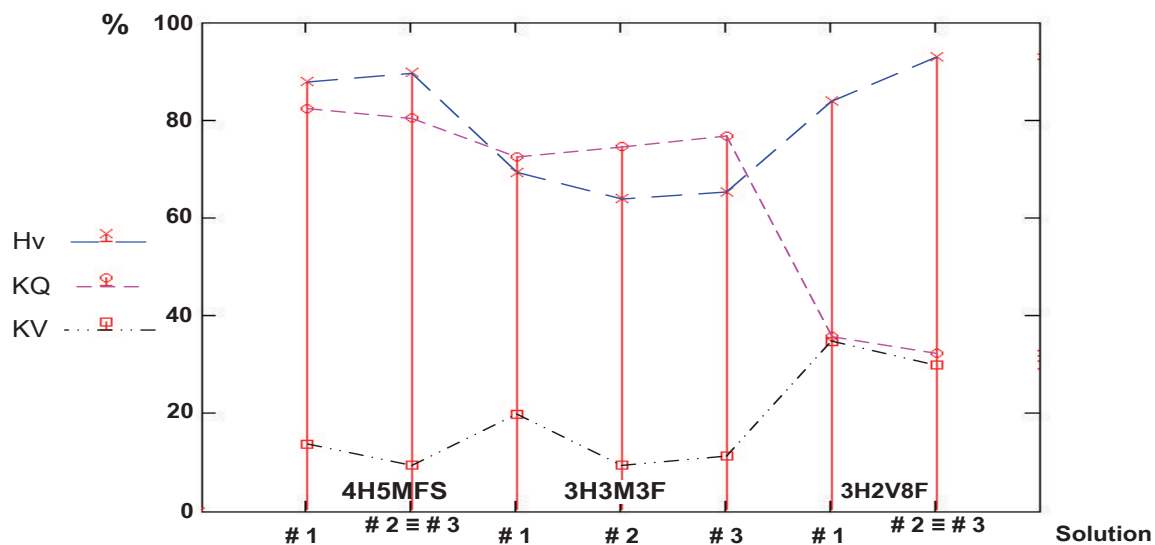


Fig. 7 Graphic interpretation of a comparative research of the multicriteria problem in the class of heat-resistant steels

The relative power consumption of the process for ion nitriding (Tonchev, 2011) is:

$$Q(X_1, X_2) = 1.13 + 0.0837 X_1 + 0.0563 X_2 + 0.008 X_1^2 - 0.0176 X_1 X_2 - 0.0123 X_2^2 \quad (10)$$

4 CONCLUSIONS

Based on the proposed approach to the problem of selection of technology solutions, taking into account the information assurance, procedures have been developed to search for the relevant mode, supplementing the archives of technological solutions.

The joint analysis of Table 4, Fig. 7 together with the expended power, determines decision # 1 of

steel 4H5MFS as the most effective of the class of heat-resistant steels with corresponding treatment. An approach based on the method described above selects a representative of a given class to meet the preset requirements.

The search and the evaluation of the effective solutions allow the cost reduction of technological reengineering of production, in order to ensure the quality of the planned production and shorten the terms of receipt of the product.

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INTELLECTUAL MIGRATION AS AN ISSUE OF CONTEMPORARY EDUCATION IN UKRAINE

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Abstract

This article discusses the causes and consequences of intellectual migration, brain drain, or the migration of Ukrainian scientists and educators from Ukraine. Causes for brain drain are: lack of reforms in education and science; low public spending on science and education; no conditions for work; the artificial obstacles for obtaining foreign grants and scholarships; no material and housing conditions; no moral or psychological freedom; no decent wages. Consequences of brain drain are: lack of reforms in the state; the significant lag in education, science, and in socio-economic and cultural areas; isolation from worldwide innovation and progress; political and socio-economic crisis; loss the status of the scientific country. Also this paper examines the dynamic of the reduction in the number of scientists from 1990-2012. The conclusions of the study are assumptions about the negative consequences of the current situation in the Ukrainian education and science system for Ukraine's future. We are sure that only real and consistent reforms of science and education can protect the Ukrainian system of education and science from irreversible processes. The country needs real reforms that could accumulate the human capital of Ukrainian scientists and educators through the creation of reasonable living and working conditions for them inside the country, not abroad. Otherwise, Ukraine could lose its status as a scientific state.

Keywords: *Ukraine, intellectual migration, brain drain, education, science, human capital, worldwide, scientists, educators, reforms of science and education, causes, consequences*

1 INTRODUCTION

One of the most complex social phenomena in the modern Ukrainian migration is the brain drain

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abroad. The most important and serious problem of modern Ukraine is the very difficult situation in the Ukrainian system of education and science, and its impact on Ukrainian society in general, and, as a consequence, the migration of the Ukrainian scientists and educators abroad. The brain drain results from the opportunities abroad



for Ukrainian scientists and educators to use their human capital and their knowledge very effectively, and at the same time to improve their financial situation.

According to experts, a significant brain drain results in the loss of national wealth of Ukraine resulting in the spiritual impoverishment of the nation.

2 THE BRAIN DRAIN OF UKRAINIAN SCIENTISTS AND EDUCATORS

Migration is a natural process, which is associated with the development of the internationalization of scientific and technological activities.

Thus, highly skilled professionals, scientists and educators, leave Ukraine to arrive in countries with better conditions for their scientific activity.

But at the same time brain drain is a serious signal to countries, including Ukraine, and because Ukraine is a third world country the brain drain in Ukraine continues as well. In general brain drain is "a serious challenge for African countries, such as Ethiopia, Kenya, Nigeria, for countries of Latin America, and for other countries too" (Skrypnyk, 2013).

Every year, thousands of professionals, scientists and educators, those that have themselves been trained by professionals, are going to the United States, Canada, Germany, Israel, Spain, Italy, and Russia, thereby investing in these countries.

The countries receiving these scientists also receive huge revenues. The last U.S. census showed that 22.4% of U.S. citizens with advanced degrees are of foreign origin. This category includes 16.5% scientists and engineers with a bachelor's degree, 20% - with a master's degree, and 37.6% - with the degree of Doctor of Science (Danilishin, 2006).

By the methods of calculation of a UN research organization, the donor country loses the equivalent of about 300,000 USD per year. The countries receiving this human capital, in turn, get the opportunity to save significant funds for their creation and accumulation (Borodina, 2003).

The most attractive for them are Russia, the USA, and Germany. These countries account for

65% of Ukraine's total number of intellectual emigrants abroad. Nearly one in seven of them work in the fields of physical and mathematical sciences, one in five works in technical or biological areas (Danilishin, 2006).

Although data from several sources is inconsistent regarding the number of scientists who leave the country, every source agrees on one thing: brain drain is a serious signal to the state, therefore today we need to think about the future of Ukraine.

3 ANALYSES OF UKRAINIAN EXPERTS' RESEARCH ON BRAIN DRAIN

According to studies of O. Meh, the largest mass departure of scientists with PhD degrees was in the 1990s. From 1991-1999, the country lost 268 PhD's, who took up permanent residence abroad (Meh, 2012);

According to studies of ex-Ombudsman N. Karpachova of Ukraine, from 1993-2003, 574 doctors and 907 candidates of the sciences emigrated from Ukraine (Karpachova, 2003; 2005);

According to studies of B. Danilishin and V. Kutsenko, in 2004 alone, more than 600 PhD's emigrated from Ukraine (Danilishin, 2006);

According to studies of O. Golovinov, in recent years Ukraine has lost nearly 5-5.5 thousand scientists (Golovinov, 2004);

According to studies of A. Chukhno, more than 6 thousand scientists left the country in search of work and the opportunity to realize their knowledge (Chukhno, 2003);

According to studies of V. Polokhalo, between 1991 and 2011, the number of doctors and candidates of the sciences involved in scientific and technical activities decreased by 8,848 (28%) (Polokhalo, 2011).

In general, the costs of training a highly skilled scientific and technical profile for the donor country are nearly 800,000 USD.

This amounts to a huge loss for Ukraine. And if to the category of scientists and educators we add highly-qualified engineers, technicians, physicians, and cultural workers, the loss of Ukraine will be much more (Golovinov, 2004).

4 THE MAIN REASONS FOR THE DEPARTURE OF UKRAINIAN SCIENTISTS AND EDUCATORS ABROAD

What are the main reasons for the departure of Ukrainian scientists and educators abroad?

It is the devaluation of the educational potential, the destruction of the policy of regional development, the weak state regulation of labor relations, etc. (Golovinov, 2004).

According to studies of A. Sych, other significant reasons for the Ukrainian brain drain are (Sych, 2013):

- a) The intense commercialization of Ukrainian education;
- b) A significant intensification of jobs in addition to the extremely low wages of scientists and educators;
- c) Lack of material resources for development;
- d) The absence of innovation infrastructures in the scientific institutions of Ukraine;
- e) Inefficient scientific activities of university teachers;
- f) An outdated structure of training, playback and the transmission of ineffective knowledge to students.

We fully subscribe to the statement of S. Kvit on the state of contemporary Ukrainian Education and Science, which is an exhaustive answer to the question about the causes of the brain drain of Ukraine:

«The situation in Ukraine probably reflects the worst of all the post-Soviet systems. ... Ukraine cannot demonstrate any benefits that have come its way in connection with post-Soviet changes to its higher education system since 1991. ...In all the former Soviet republics apart from the Baltics, the legacy of the Soviet days remains. They have similar rules still in force, have structurally similar higher education institutions and a similar research infrastructure, and post-Soviet patriotism and corruption are common» (Kvit, 2013).

So, Ukraine has created all of the conditions for brain drain. This phenomenon is still in progress in the country, because the modern Ukrainian system of education and science does not allow the Ukrainian progressive scientists, who speak

foreign languages, to evolve and get a worthwhile reward as the fruits of their labor in their country of origin.

This system does not allow the Ukrainian scientists to maintain their human capital at the level of world standards, because it:

- a) Does not create conditions for their work and their creativity;
- b) Often makes it impossible for them to take part in the international competitions of foreign grants and scholarships, thus preventing the development of their human capital;
- c) Does not care about their material and housing difficulties;
- d) Inhibits them morally and psychologically;
- e) Does not pay them properly for a scientist's work, because the state is trying to maximize savings through their wages.

Therefore, these and other factors are pushing scientists to travel abroad.

5 THE COUNTRIES THAT BENEFIT FROM UKRAINE'S BRAIN DRAIN

We assume that the vast majority of Ukrainian scientists of the former Soviet Union, who in the 1990's and 2000's went abroad, did not speak the European languages, so, most of them left for permanent residence in countries of the former socialist camp, or in the countries of the former Soviet Union, where they found better living conditions and a comfortable environment for their research. Fewer scientists left Ukraine and went to the USA and EU countries: Germany, Poland, France, Italy, Portugal, etc.

Today, the vast majority of the young Ukrainian scientists who are leaving Ukraine for work and permanent residence abroad are fluent in English or other European languages, depending on the country to which they are heading (Abreu Bastos, 2013).

As the situation in the field of higher education and science has not improved from the first wave of intellectual emigrants 20 years ago, nor has the conditions in Ukraine in general, brain drain continues much more strongly today.

6 THE CURRENT SITUATION IN UKRAINIAN UNIVERSITIES

Education today has moved away from the traditional allocation of resources, and has become a big business. (Poplavskaya, 2002);

Corruption and bribery have penetrated into all areas of higher education. As a consequence, in 2012, according to research by the International Organization "Transparency International," Ukraine was the most corrupt country in Europe (Kalts, 2012).

Universities have forced scientists and educators to go on unpaid vacations "at their will" (Anon, 2012) in times when their salaries are among the lowest in their fields in Europe, only 350-400 USD per month (Koshulko, 2012A).

The wage level of the Ukrainian scientists at 350-400 USD per month helps to explain the brain drain. This is the great benefit for the recipient country, getting the ready trained professionals from a country that doesn't want to take care of its scientists and educators. Because, how can we otherwise explain the tenfold difference in pay of an Associate Professor with a Ph.D. between Ukraine and countries of the EU?

We can explain this situation only by the lack of desire of Ukraine to take care of its citizens, the Ukrainian scientists and educators, and the other people as well (Abreu Bastos, 2013).

7 REDUCING UNIVERSITY TEACHERS IN A NEW WAVE OF THE BRAIN DRAIN OF UKRAINE

In one of the initiatives under the Action Plan for 2013, the President proposed to reduce the number of teaching positions in Ukraine by 33%. Thus, this reduction affects 30-48 thousand Ukrainian scientists and educators. According to the study of L. Hrynevych, the main purpose of this plan is to achieve formal indicators, not the quality of education (Hrynevych, 2013).

Parliamentarians will try to help university teachers who are taking an appeal to the President to stop the savings on education and the sciences. Otherwise, the layoffs will provoke a new wave of intellectual migration from Ukraine.

In our previous studies (Koshulko, 2013), we proposed reducing the number of branches and

departments of the Ukrainian higher education institutions, to focus on the principles of quality education rather than quantity, because the number of universities in Ukraine together with their branches and departments are considerably higher than in the major European countries. Of course, first of all, it is the reduction of branches and departments scattered in different cities, because these branches devalue higher education in general, and are a favorable environment for corruption.

Even without the President's scheduled dismissal to reduce the number of teaching positions in Ukraine, the number of scientists and educators has steadily declined during the last twenty years. According to the State Statistics Service of Ukraine, the total number of scientists and educators from 1991 to 2012 was decreased by 74% (Anon, 2013A).

In this case, the main goal of the Ministry of Education and Science of Ukraine should be to preserve the quality of the human capital of the Ukrainian scientists and educators.

8 THE CRITERIA FOR ASSESSING THE HUMAN CAPITAL OF THE UKRAINIAN SCIENTISTS AND EDUCATORS

How can the human capital of the Ukrainian scientists and educators be evaluated? What are the criteria for the assessment?

We propose the following criteria for assessing the human capital of the Ukrainian scientists and educators:

- a) Through the level of English, because English is the language of international communication;
- b) Through the degree of integration of each individual scientist and educator in the world and the European scientific community (international grants, scholarships);
- c) Through the number of joint projects with foreign scholars;
- d) Through the publishing of English-language articles in the international scientific journals that have strong influence (Koshulko, 2013).

The state should be encouraging Ukrainian scientists and educators to be competitive, to

develop their human capital, to support their publication as of the results of their research in the international journals, etc. (Koshulko, 2012B).

Otherwise, the dismissal of scientists and educators without the qualitative assessments of their human capital can be regarded as ill-conceived and the causing of irreparable harm for Ukraine that will stimulate a new wave of intellectual migration, which is fraught with irreversible consequences for the sciences, education, and, ultimately, for the Ukrainian society as a whole (Makazan, 2013).

9 THE CONSEQUENCES OF ILL-CONCEIVED AND INEFFECTIVE REFORMS IN EDUCATION AND SCIENCE FOR UKRAINE

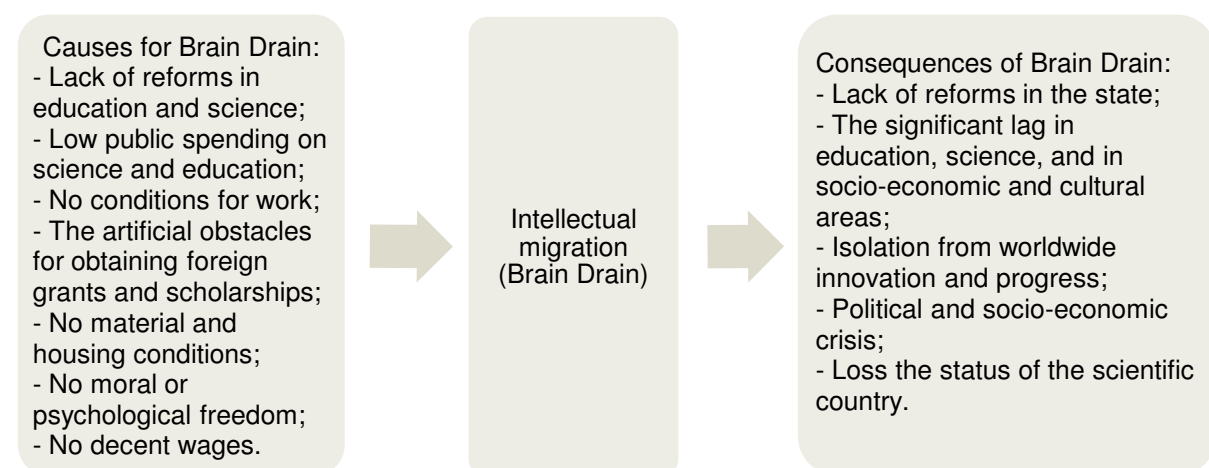
As noted, Ukraine cannot demonstrate any benefits that have come its way in connection with post-Soviet changes to its higher education system since 1991. If, to this situation we add the dismissal of 30-48 thousand scientists and educators with their qualitative human capital, this means that the dispersion of the accumulated high-quality human capital from Ukraine continues, and the country will be much more isolated from worldwide innovation and progress. Also, the country can forever lose its status as a scientific state over the next 5-10

years, as a consequence of having the very lowest level of public spending on science in Ukraine today.

According to the studies of L. Hrynevych, now it is not possible to talk about the development of science with the very low current level of public spending on science in Ukraine, because the current level of 0.29% of GDP of public spending on science in the state is at its lowest since the independence of the country.

At the same time public spending on science, guaranteed by Ukrainian law, is 1.7% of GDP in Ukraine, while the average level of public spending on science worldwide is 2%. As a result, according to the studies of L. Hrynevych and *Osvita.ua*, through the current level of very low public spending on science in Ukraine, the country can forever lose its status as a scientific state over the next 5-10 years (Anon, 2013B).

Therefore, the intellectual migration from the country is the consequence of the absence of reforms in the state. The country needs urgent reforms, because otherwise the lag in education, science, and also in socio-economic and cultural areas in comparison to other countries will be more noticeable every year. Scheme 1 will introduce the causes and consequences of intellectual migration, brain drain, from Ukraine.



Scheme 1 The causes and consequences of intellectual migration, Brain Drain, from Ukraine

10 CONCLUSIONS

The dilemma is that the country's best scientists and educators leave. Ukraine has created all of the conditions for brain drain. This phenomenon

is still in progress in the country, because the modern Ukrainian system of education and science does not allow the Ukrainian progressive

scientists to evolve and get a worthwhile reward as the fruits of their labor in their country of origin.

They are mobile and active, they speak foreign languages, they have international contacts with foreign universities abroad, and their talents and achievements have already been appreciated abroad. After all, only reforms in the system of education and science in Ukraine can make a difference with the brain drain of the country.

Today, the country needs real reforms that can accumulate the human capital of Ukrainian scientists and educators through the creation of decent living and working conditions for them inside the country, not abroad.

Therefore, the main goal of the Ministry of Education and Science of Ukraine should be to preserve the true quality of the human capital of

the Ukrainian scientists and educators for the future of Ukraine.

But if the country will not change its strategy for the better in the development of the system of education and science in Ukraine in the near future, the state will continue irreparably to lose the human capital of its best scientists and educators, who could otherwise help to raise the country to the level of one of the advanced countries of the world.

So, the intellectual migration from the country is the consequence of absence of reforms in the state. The country needs the urgent reforms, because otherwise lag in education, science, and also in socio-economic and cultural areas in comparison to other countries will be noticeable more and more every year.

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WINNING TEAM CREATION IN CRISIS CONDITION: CASE STUDY OF PROFESSIONAL BASKETBALL CLUB

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If you want to achieve success you have to produce results.

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Abstract

Team sport success is defined by combination of factors: psychophysical state of the players (cognitive, emotional-motivational and corporal), social factors (team cohesion, interpersonal relationships on the relations: management staff-coaching, staff-players, the players between themselves, sometimes the relationships with the public) as situational factors (elements of competitive situation). All of this mentioned factors can decide between victory and defeat in the competitive situation. Management of sport team is especially important in crisis situations (acute result crisis), and for its resolving it is extremely important to diagnose the causes, accept the facts, communicate the problem and in resolving the problem involve all the club members, this means the adaptation of Action Research methodology. So in every efficient management consulting it is needed to determine key problems (by gathering and analysing the broader spectrum of information, identify the causes of the problems and define and conduct the therapy). With such a procedure can be created the model for resolving the crisis situations in the sports clubs. So this paper presents a model for resolving crisis situations in sports teams on the example of one professional basketball club in Croatia. The crisis was solved by crisis identification by variety of measuring instruments and procedure and then followed elimination of its causes. The problems of management staff (N=3), coaching staff (N=2) and players (N=25, seven seniors and eighteen juniors/cadets) were first identified, and then corrective activities were undertaken to overcome the crisis. After the acute phase

of the crisis was terminated, the club management was consulted in terms of human resources management (recruitment, selection, evaluation of performance and potential,

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promotion to player positions, motivation and rewarding with an individualised approach to each player) and then some structural interventions were suggested (both in the senior team and the supporting junior/cadet team). This work resulted in the presented model (procedure) for solving not only acute crisis but also structural problems in the sport teams.

Keywords: action research, crisis management, human resources management, organizational consultancy, structural team problems, winning team

1 INTRODUCTION

In collective sports success is determined by a set of factors: psycho-physical condition of athletes (cognitive, emotional-motivational, corporal-physiological variables), social variables (team cohesion, relations along the line management-coaches-players, interpersonal relations among players, and sometimes even their relation with the audience), and situational factors such as competitive situation and environmental elements (Wann, 1997). Each of these factors can be a decisive element between victory and defeat. In fact, in collective sports such as basketball, success may be illusive and extremely uncertain and one moment of distraction during the game can instantly turn victory into defeat.

Creating, leading and maintaining a winning sport team involves not only professional knowledge in a particular sport but also some knowledge of applied psychology, human resources management, team leading and ability to diagnose and solve a variety of problems that may be the cause for suboptimal achievement. In fact management competences primarily reflect in creating and maintaining the winning team of the organization (Bogdanović, 2003).

Human resources management and leadership is particularly important in acute crises, i.e. in situations when there is no effectiveness in goal achievement, when results do not meet expectations, and when the set goals are in mutual conflict. Namely, crisis is defined as situation in which effectiveness of a system is below the required or expected one for a longer period of time (Pastuović, 1999). The result crisis is particularly frustrating when it is supported by the awareness that in spite of adequate resources results are not achieved, and that causes for that cannot be discovered, which can lead to psychosocial incidents. No crisis can be solved by criticizing its results but rather by acting

on its causes. Therefore, to defuse and overcome it we firstly have to identify its causes. Any approach which contributes to the recognition of the problem and the way to tackle it will be good, but scientific approach will be the most appropriate one because it allows repetition. This approach needs the adaptation Action Research methodology because any change requires action (is directed at achieving this), and successful action is based on analysing the situation correctly, identifying all the possible alternative solutions and choosing the one most appropriate to the situation at hand (Bennett, 1983 according Burnes, 2004, 983).

The first step in facing the crisis and overcoming it is acceptance of reality (facts). It is also necessary to get prepared for the crisis situation psychologically and materially, while good communication will be a precondition of effective therapy where crisis is transformed in an opportunity. Successful organizations have methods to timely recognize, obviate and overcome crisis thus reducing its duration and consequences (Osmanagić-Bedenik, 2003). Naturally, here it is important to stress the constructive character of the crisis as it can also be seen as a challenge in posing new questions (which otherwise may not have been asked at all) and looking for the new answers. Therefore the crisis can be a stimulus for the new beginnings and a new, higher level of operation for the sport team.

To determine the factual conditions in a team a number of variables are used that are seen as important predictors of achievement and creation of a winning team (Kane, 1972; Wurtele, 1986; Baron & Birne, 1991; Bezinović, 1993; Corsini, 1994; Wann, 1997; Dukić, 1997; Derri, Kioumourtoglou & Tzetzis, 1998; Tudor & Srića 2006). The chosen important key variables are:

- leadership,
- motivation,

- confidence and self-esteem,
- athlete's personality,
- intelligence,
- stress, anxiety and insults,
- team cohesion.

This work is conceived to provide answers for the concrete problems of a basketball club experiencing a result crisis by the method of cause identification after collecting and analysing a wide range of information on the operating basketball club. In the long run it is also necessary to determine and solve the structural problems of the team in terms of human resources management, by selection, training, evaluation of performance and potential, motivation and rewarding, promotion to player positions, and specific individualized psychological and sociological approach to each athlete.

The purpose is to contribute to creation of the winning team in basketball and in other team sports using the same or similar principles and considering the characteristics of each given sport. The goal of this work is to design an operating model that will integrate knowledge of psychology and human resources management with the empirical data in concrete situations. The model and case study presented here will allow sport and other managers and other people involved in sport to raise their operation to a higher level and base their achievement on the scientific and professional bases.

To be successful in an activity is possible without cognition of what leads to success, but then it does not have scientific and professional basis because it does not allow testing of cause-effects relations, i.e. such approach offers uncertainty in repeating success and it lacks the possibility of generalization and use for other teams or situations. The characteristic of systematic knowledge know what is to be done, how and why it is to be done in order to plan, organize, direct and control some process with a particular purpose (this is management by definition).

The task is to use the empirical basis (psychosocial database) in order to determine the causes for sub-optimal achievement, suggest measures, monitor the proposed measures, and correct them by the time the success or failure of

the treatment is perceived. Consequently, the first step is to create the players' psychosocial database as a diagnostic instrument, the second step is to determine the causes of problem by analysis, and the third step is therapeutic and involves proposal of intervention measures to the Club Management with their monitoring and correction.

The problems to be solved by this work spring from the practical need for achievement of the Club Management in the basketball league. Therefore this work is in fact the result of practical professional intervention in the situation when the sport team is expected to achieve better results. The problems involve changes to be carried out on the three levels of the basketball club: Management, Coach, and Players. Therefore the problems are formulated in the following way:

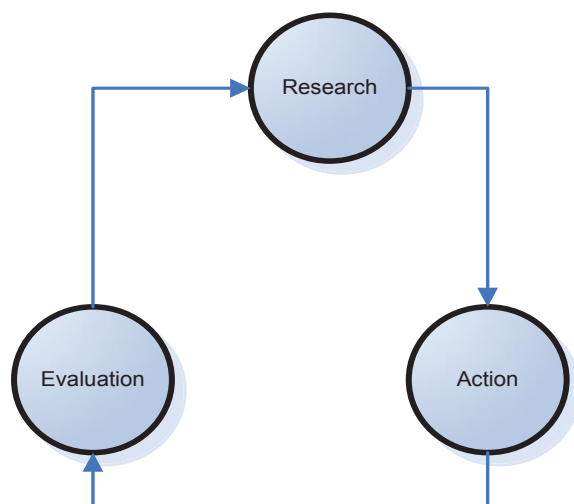
1. Identify the problems of Management, primarily with the players and the Coach. Suggest solution, monitor and correct the situation in accordance with the set goals.
2. Identify the problems of the Coach. Suggest solution, monitor and correct.
3. Identify the problems of the players in terms of selection and activation of their potentials. Determine team cohesion, internal functioning of the team and group efficiency (operationalized through the game results).

2 METHOD

This work adapted Action Research methodology which proceeds in spiral steps each of which is composed of a circle of planning, action, and fact-finding about the results of the action. Action Research is an iterative process whereby research leads to action and action leads to evaluation and further research (Lewin, 1946 according Burnes 2004, 984) (Drawing 1).

Namely, according Kurt Lewin's view one cannot understand an organization without trying to change it (Schein 1996, 64). So to have the desired change in the studied basketball club it should adapt methodology which has two-pronged processes to give answers on the questions:

- a) What is the present situation?
- b) What shall we do?



Drawing 1 Process of Action Research (Source: Lewin 1946 according Burnes, 2004, 984.)

First, to have successful action, the situation should be analysing correctly. Second, change requires action and is directed at achieving this.

3 PARTICIPANTS

The research involved the Management of a professional Croatian basketball club (3 members), the Coaches (2 members), and basketball players (25 members including 7 seniors and 18 juniors/cadets i.e. juniors in further text). The members of the Management were consulted about the problems they wanted to solve. The coaches took part in evaluation of their players, and the main testing consisting of a variety of instruments was carried out on the players:

- 7 seniors aged 21.79 on average (ranging from 18.5 to 25)¹
- 18 juniors aged 16.28 on average (ranging from 15 to 17.5)

As in the Croatian Basketball League five (5) team players play simultaneously, player

¹ Originally in the first testing session were 6 seniors, and in second testing session 19 juniors. But very shortly after testing time (senior and junior team members) one older junior player joined full-time to the senior team, so in fact there were 7 tested senior players. The section results represents the originally made testing and results where were 6 seniors and 19 juniors. Joined junior to the senior team is marked.

substitutions are necessary due to personal fouls, tiredness or injuries. These substitutions are provided from the group of junior players.

4 INSTRUMENTS

4.1 General Questionnaire for Basketball Players

To collect the general data on players (demographic data, psychological characteristics, social characteristics, health condition relevant for athletes) a General Questionnaire for Basketball Players was used, which was constructed by the author on the basis of consulted literature on sport psychology. The questionnaire contains 54 items created by author (see Appendix 1.).

4.2 Organizational based Self-Esteem (OBSE)

To measure the team self-esteem the author used the scale Organization Based Self-Esteem (OBSE) designed by Pierce, Gardner, Cummings i Dunham (1989.) The scale consists of 10 items referring to the assessment of the degree to which players consider themselves valuable, useful and efficient team members. Each statement was to be answered on the Likert type continuum with five possible answers (strongly disagree; disagree; neither agree nor disagree; agree; strongly agree; - see Appendix 2.).

4.3 Problem test

To measure intellectual functioning of players the author used the standardised Problem Test designed by Bujas, Szabo, Kolesarić (Slap, 1996). The test contains 70 items.

4.4 Questionnaire on sensitivity to insult

To measure sensitivity to insults the author used three identical questionnaires for situations when the player is insulted by the coach, by a co-player, and by an opponent player during the game. The purpose was to determine emotional stability and functioning under stress. This questionnaire was standardised by Levar, A. (1996) in her graduation thesis (see Appendix 3).

4.5 Minnesota Multiphasic Personality Inventory (MMPI-201)

The standardized clinical test MMPI-201 was used to diagnose the existence of a particular problem with the player for selection purposes and to determine normal functioning of personality. The test contains 201 items and 11 scales (lie scale, strange answer scale, control scale, hypochondriasis scale, depression scale, hysteria scale, psychopathic deviation scale, paranoia scale, psychastenia scale, schizophrenia scale, and hypomania scale).

4.6 Eysenck Personality Questionnaire (EPQ R/A)

The standardized Eysenck Personality Questionnaire EPQ R/A was used primarily to measure the degree of emotional stability, but also for other personality characteristics:

- psychoticism (callousness, cruelty, indifference to other people, loneliness and insulation, inconsiderateness of danger, lack of empathy, guilt and sympathy)
- extraversion / introversion
- neuroticism (emotional instability)
- lie (propensity to present oneself in socially desirable light)
- adventurism (extraverted impulsiveness)
- criminality (predictor of delinquency)

The questionnaire consists of 106 items.

4.7 Questionnaire for Coaches

The questionnaire of player assessment by the coach is an indicator of player quality and the measure of comparison with the achieved results. The questionnaire was obtained from the magazines BASKETBALL [In Croatian.] (30/08/1998) and SUPERSPORT [In Croatian.] (28/08/1998). It is used by journalists to evaluate NBA players in the USA. It consists of 9 items referring to evaluation of basketball player's qualities. Each statement is answered for each individual player on the Likert-type continuum with five possible answers (does not possess the quality at all; does not possess the quality;

neither possesses nor does not possess the quality; possesses the quality; possesses the quality to a high degree; - see Appendix 4).

4.8 Sociometric testing

Sociometric testing was carried out with both seniors and juniors to determine the social status of each player (in three contexts: playing in competitive situation, training and free activities) and determine the functioning of the club from the social viewpoint (see Appendix 5).

4.9 Men as the measuring instrument

In practical clinical work it is impossible to obtain all the necessary data by standardized instruments. Therefore the clinician steps in and tries to perceive in verbal and non-verbal communication the things that otherwise remain hidden in order to solve the concrete practical problem.

5 PROCEDURE AND PRELIMINARY PROPOSITIONS ON WHICH THE RESEARCH WAS BASED

A multi-stage investigation and consulting of all the entities involved in the operational results of the club was carried out including the members of the management, coaches and players. The process of problem identification and goal setting developed in the following way:

A) Goal setting: Arrangement to test the senior team that is directly involved in result achievement.

The team crisis is obvious as despite the plan to win the league championship they have recorded only one victory and four defeats which places them at the bottom of the league rank threatening with fallout from the league and cancellation of sponsorship contracts. Subsequently the junior team is to be tested. In this stage the testing was performed on the first six senior team players by the measuring instruments.

The results obtained in this investigation suggested the following problems:

1. Dissatisfaction with the Management concerning financing, availability of sports equipment, disregard of agreements with the players.

2. Dissatisfaction with the Coach reflected in the lack of discipline and trust.
3. Problems with players' perception: apathy and lack of confidence in some players, non-identified leader, low motivation, poor coordination among players resulting in a disrupted team spirit.

B) Response to target problems

The situation requires intervention. In the meeting with the management it is agreed that the first goal is to win the next two games to overcome the current crisis. The steps to be taken are:

1. The Management guarantees to fulfil all the outstanding obligations to players.
2. The Coach undertakes to talk to the players to get their trust and either take on his role or leave his post. It is to be noted here that the Coach is relatively new (only about a month in this position) so this correction is deemed possible, while the previous coach has resigned due to the team fiasco.
3. The players are informed about the situation, and after a motivating discussion commit to do their part of the job which is to achieve a good result in the next two games.

All this is resolved in a meeting in which the players, the Coach, and the Management take part in the discussion and commit themselves to fulfil their obligations. The Coach and the players discuss their misunderstandings and the Coach is given a vote of confidence. The players are submitted to a motivation practicum. In this practicum the players are mentally energized by the following procedure (similar motivation procedures are also possible and they can all be reduced to a saying: *If you want to achieve success you have to produce results.*):

"I would like to tell you something that you yourselves have already admitted. As a team you are a bunch of losers that are not worth the money spent on you. However, there is something that puts the odds in your favour. In teams like your, the difference between the winners and the losers is in the mind, which is motivation. By your other

features you are either the same or better than the others. The issue is how to activate this difference, how to become motivated.

The chances are that the club fails which will also reduce your price. It is high time you set your heart on winning the next two games at any price. The decision is absolutely yours. Your self-esteem is very low – with it you are bound to lose any game. Nevertheless, you are able to achieve a 30-40% better result. Let each one of you make up his mind whether he is prepared for that.

The game is the test. I absolutely believe that you can win. If you don't there is no point. If you don't win you are not worth the effort invested in you. That is the difference between professionals and amateurs.

If you don't win, there is no career. Here we are all on the same job. The chances to continue our operation together depend on your winning the game tomorrow (Wednesday) and on Saturday. Encourage your team-mate if you see him giving up!" (The players are asked to commit themselves.)

Committing themselves to victory one by one, the players consciously make up their minds.

In the subsequent games the following results are achieved:

- 3.1. The first game is won.
- 3.2. The second game is lost but in overtime, i.e. after a tied score in the regular time, which indicates not an absolute failure but a relative one.
- 3.3. The third game (against a very tough opponent) is won.

As this sequence of events is relatively successful, the team temporarily overcomes the crisis, which can be at least partly credited to the described activities. During the pause in the basketball season the next stage of the project can be started.

C) Testing of juniors

As the senior team is completed by junior players, and as they are a guarantee of

continuation, and since one of the seniors has left for another club (player 1.5.), the testing of juniors is carried out including a newly engaged senior player (player 2.19.).

D) Recovery measures

After the research is completed the recovery measures are proposed, which will be discussed in more detail in the paper.

6 RESULTS

The results obtained by the testing of seniors are shown in the Table 1.

Table 1: Senior team testing results

Table legend:

No – Player's order number
Brth – Month and year of birth. Age is transformed into numerical codes for anonymity and ethical reasons
Name – Names transformed into numerical codes for anonymity and ethical reasons
Height – according to player's statement
Weight – according to player's statement
LSat – player's life satisfaction
MSSat – player's satisfaction with his material status in the club
SNSat – satisfaction of sport needs in the club
IPSat – satisfaction with interpersonal relations in the club

CSat – satisfaction with the Coach
MSat – satisfaction with the management
Rec – perception of importance of recognition in this sport
Ach – perception of high achievement
PS – feeling after practice session
Fit – perception of fitness
Speed – perception of speed
Coord – perception of movement coordination
Shot – perception of shot preciseness
Creat – perception of creativity
Coop – perception of cooperativeness
Mat – perception of maturity
SelfR – self-esteem
Intel – level of intellectual functioning expressed in Z-values
MMPI – results of multifactor personality inventory MMPI
EmSt – emotional stability from EPQ R/A (M=11.08 s=5.37). Negative to +0.9 Z-values denote emotional stability
InsC – perception of insult by the coach
InsTM – perception of insult by teammate
InsOp – perception of insult by opponent player
CoachEv – player evaluation by Coach expressed as arithmetic mean
PCat – classification by age (S=seniors, C=Cadets, J=juniors)
ClubExp – perception of club expectation

No	Brth	Name	Height	Weight	LSat	MSSat	SNSat	IPSat	CSat
1.	6. 86.	1.1.	200 cm	93 kg	4	3	2	3	4
2.	1. 86.	1.2.	198 cm	87 kg	4	3	2	4	2
3.	10. 86.	1.3.	205 cm	93 kg	4	3	3	4	4
4.	1. 87.	1.4.	182 cm	74 kg	3	2	3	3	3
5.	6. 87.	1.5.	201 cm	94 kg	4	3	3	4	4
6.	5. 90.	1.6.	194 cm	91 kg	5	2	2	2	1

No	MSat	Rec	Ach	PS	Fit	Speed	Coord	Shot	Creat
1.	2	5	3	4	4	4	3	3	2
2.	2	5	3	1	3	4	4	3	3
3.	3	4	4	3	4	4	4	4	3
4.	2	4	4	2	4	3	4	2	4
5.	2	4	4	3	3	4	4	4	4
6.	2	3	-	4	4	4	4	5	-

No	Coop	Mat	SelfR	Intel	MMPI	EmSt	InsC	InsTM	InsOp
1.	4	4	3.6	+0.25Z	NAD	-0.39Z	9.22	9.11	9.37
2.	4	2	4.3	-0.94Z	Low emotional energy	-1.32Z	5.96	2.59	1.00
3.	4	3	4.0	+1.45Z	NAD	-1.13Z	2.04	2.07	3.74
4.	4	2	3.5	+1.36Z	NAD	-0.91Z	4.04	1.59	1.00
5.	4	3	4.0	-0.39Z	NAD	-1.50Z	9.22	9.22	3.88
6.	-	1	5.0	-0.76Z	Hypomania (full of emotional energy)	-1.13Z	0.85	1.19	0.00

No	CoachEv	PCat	ClubExp	No	CoachEv	PCat	ClubExp
1.	3.00	S	4	4.	3.30	S	3
2.	3.00	S	4	5.	3.88	S	4
3.	2.88	S	3	6.	4.11	S	-

The obtained results provide a psycho-social database (which due to its size and confidentiality is shortened presented here) as the basis for the personal record for each player, which besides

these data also includes the author's perceptions and analyses (practice sessions, games, conversations). The results obtained by testing junior players are shown in the Table 2.

Table 2 Young players testing results

No	Brth	Name	Height	Weight	LSat	MSSat	SNSat	IPSat	CSat
1.	5. 96.	2.1.	190 cm	90 kg	4	3	2	3	3
2.	11. 96.	2.2.	200 cm	90 kg	4	2	3	2	3
3.	4. 96.	2.3.	181 cm	56 kg	5	2	2	3	2
4.	6. 96.	2.4.	200 cm	85 kg	4	2	2	4	4
5.	8. 96.	2.5.	180 cm	75 kg	5	4	3	3	3
6.	9. 96.	2.6.	188 cm	73 kg	4	4	4	5	4
7.	11. 96.	2.7.	188 cm	78 kg	4	1	1	1	2
8.	1. 95.	2.8.	207 cm	90 kg	3	2	3	3	4
9.	11. 94.	2.9.	195 cm	85 kg	4	4	4	4	4
10.	8. 95.	2.10.	199 cm	82 kg	4	4	2	4	4
11.	9. 95.	2.11.	190 cm	73 kg	4	3	2	3	2.5
12.	6. 95.	2.12.	190 cm	80 kg	5	3	4	5	5
13.	5. 95.	2.13.	191 cm	76 kg	4	3	3	4	3
14.	8. 95.	2.14.	191 cm	70 kg	2	3	2	5	2.5
15.	9. 94.	2.15.	190 cm	87 kg	4	-	3	2	2
16.	9. 94.	2.16.	186 cm	76 kg	5	4	3	4	4
17.	3. 96.	2.17.	190 cm	70 kg	4	3	2	2	3
18.	10. 96.	2.18.	195 cm	78 kg	5	3	3	1	4
19.	9. 93.	2.19.	202 cm	96 kg	3	1	3	4	3

No	MSat	Rec	Ach	PS	Fit	Speed	Coord	Shot	Creat
1.	3	5	4	4	3	3	4	4	4
2.	2	5	4	3	3	2	3	4	3
3.	1	5	3	3	3	4	4	3	3
4.	4	4	4	4	2	3	1	2	4
5.	3	4	4	4	3	5	4	3	4
6.	4	5	5	3	3	4	4	2	3
7.	1	2	3	3	3	2	4	4	4
8.	3	5	5	4	1	1	2	3	4
9.	4	4	4	4	3	3	3	3	4
10.	2	5	5	4	4	3	4	2	4
11.	-	5	4	3	4	4	4	4	5
12.	3	4	4	5	3	3	4	3	4
13.	2	4	4	2	3	3	4	3	4
14.	4	4	4	1	4	4	3	3	3
15.	3	5	4	-	3	3	4	4	4
16.	3	5	5	4	2	2	2	5	4
17.	3	5	4	3	3	3	3	4	4
18.	3	4	5	-	2	4	4	4	2
19.	3	5	4	3	2	3	4	4	4

No	Coop	Mat	SelfR	Intel	MMPI	EmSt	InsC	InsTM	InsOp
1.	4	2	4.1	-0.48Z	NAD	-0.01Z	1.96	0.00	8.78
2.	4	2	3.8	+1.17Z	NAD	-0.76Z	6.48	4.59	3.00
3.	3	2	4.0	-0.21Z	NAD	-1.13Z	6.74	0.00	8.70
4.	4	2	3.1	+0.71Z	NAD	-0.19Z	6.30	2.19	0.67
5.	4	2	3.6	-2.78Z	depression	-0.95Z	0.74	0.70	0.00
6.	3	2	3.5	+1.36Z	NAD	+0.73Z	6.14	7.89	1.70
7.	4	3	2.5	-1.13Z	Anxiety neurosis	+1.85Z	4.48	1.52	3.78
8.	4	2	3.7	+0.16Z	NAD	-0.76Z	8.59	5.59	4.19
9.	4	2	4.0	-2.23Z	NAD	-1.13Z	7.66	2.70	3.15
10.	4	3	4.0	+1.08Z	NAD	-0.01Z	0.00	1.33	0.00
11.	4	2	4.3	-1.13Z	NAD	-1.13Z	2.88	1.19	1.70
12.	5	2	3.8	+0.62Z	malingerer	-1.3Z	0.37	0.37	10.00
13.	4	2	3.7	+0.62Z	NAD	+0.36Z	2.62	3.93	1.22
14.	3	2	4.0	-0.48Z	NAD.	+0.54Z	3.37	0.70	3.56
15.	4	1	4.3	-0.30Z	NAD	+0.17Z	3.59	5.37	2.52
16.	4	1	4.2	-0.30Z	NAD	-0.95Z	0.04	4.92	1.48
17.	4	2	3.8	+0.44Z	NAD	-1.50Z	5.07	3.96	1.85
18.	4	-	3.1	-0.39Z	NAD	-1.13Z	0.66	0.22	0.00
19.	5	2	3.0	+0.90Z	NAD	-0.39Z	7.60	4.63	8.37

No	CoachEv	PCat	ClubExp
1.	4.00	J/C	3
2.	3.88	C	3
3.	2.44	C	3
4.	3.00	J	3
5.	3.33	C	-
6.	4.22	C	3
7.	1.78	C	2
8.	4.00	J	4
9.	3.89	J	4

10.	3.44	J	3
11.	2.22	J	-
12.	4.00	J	3
13.	3.44	J	3
14.	3.56	J	3
15.	3.88	J	3
16.	3.88	J	2
17.	4.33	J/C	3
18.	4.00	C	3
19.	2.67	S	3

Psychosocial database is also created for juniors/cadets, which is not presented here due to its size and confidentiality.

7 DISCUSSION

The created psychosocial database is used to provide concrete suggestions with explanations to the Club Management. Each player is evaluated in terms of his potential and his future role in the club. The following propositions are provided for the senior team:

The player 1.2 for whom the Management has great expectations due to his physical predisposition does not justify them. As can be seen from the database this player does not have the necessary characteristics of a leader, he is emotionally exhausted and lacks perseverance and decisiveness, his motivation is low. Contrary to the beliefs of the Coach and almost all members of the Management, with his under average intellectual functioning he can by no means be the team leader who can drive the team in critical situations. Therefore it is proposed that this player should be replaced by another in the near future.

According to the database, the problem of team leadership could be solved only by the player 1.3 who, in addition to an above average intellectual functioning, has some leadership potential. According to the evaluation of the Coach this player has been deemed incapable of leadership and mainly marginalized, which is why he plays for fun and does not achieve his maximum. It is to be noted that this player used to play for a club

that was the finalist and runner-up in the national basketball league. As obtaining recognition in sport is important for him this player could easily take on the role of the team leader and thus solve the main and long lasting problem of the Management.

The role of playmaker held by the player 1.4 remains with him because this player has great potential due to his above average intellectual status. However, due to his psychological problems in terms of self-esteem and his low set goals, and due to his pessimistic attitude to life and the club, his endurance and perseverance are reduced so that he does not provide his optimum. This talented playmaker needs therapeutic intervention to make him escape his current crisis.

The player 1.6 is the team locomotion, physically fit, but due to his intellectual functioning at the lower limit of average he cannot make an appropriate team leader in spite of the evaluation by the Coach which is probably made because of his high emotional energy and enthusiasm. What he needs is good leadership and teammates which will, given his high motivation, allow him to function in the best possible way. There are no problems with this player, and he only has to be set in a harmonized teammate atmosphere.

The problem of the player 1.1 is low self-esteem. He needs support to be psychologically lifted.

The player 1.5 has been in the meantime replaced by 2.19, which is good because a better player is obtained in terms of both intellectual functioning and play. This could be seen

particularly in the third game when this player drove the team from defeat to victory. This player should not be pressed but rather gently communicated with. If he solves the problem of self-esteem he can drive the team even as a playmaker.

The proposals based on the psycho-social database are presented to the Management, and they completely agree with them. In terms of replacement and completion of the team with new players it is decided to rely on the junior/cadet team. The following proposals are given for the junior team:

From the player 2.6 the Coach has great expectations, which is justifiable. The player has all the necessary predispositions for a leader (above average intellectual functioning, high acceptance from teammates in the game, training, adaptability to new players, good relationship with the audience with some over-ambitiousness). His greatest problem is low self-esteem and insufficient motivation for playing basketball (for him it is just an interest), but with some corrections and adequate support by the Coach these shortcomings can be easily eliminated. Lower emotional stability results from the self-imposed high criteria and inadequate effort invested (he does not practise regularly). With more frequent practising his fitness and shot would improve. His father is his idol, which can be put to good use. The father should be consulted and asked to stress his pride in his son, the basket player, and to stress the beauty of basketball above all ball games. With more frequent publicly expressed appreciation by the coach and some intimate suggestions that he might benefit from being an acknowledged team leader his motivation and self-esteem might be boosted. It is to be noted that such player as this has been long hoped for by the Coach and by the Management.

The player 2.10 is presented in socially desirable light, although he is not popular when playing and is not unpopular when socializing. The reason for that is his impulsiveness: he loses control when he is upset, acts exclusively at his own discretion, and he is always ready to answer back. His defensive aggressiveness should be transformed into positive energy to enable him to adapt more

easily to new team members, not to be dependent on approval and not to be afraid of remarks made by other people. He would be good in the position of a playmaker because he invests a lot of effort and he enjoys practising, which justifies the great expectations of the Coach. Basketball is for him the most important thing in life. It is indicative that he is not dissatisfied with his material status in the club, but resents the Management's inadequate care for sport needs (few practise sessions, poor equipment, and similar variables), which only confirms his wish to make progress in basketball.

As his intellectual functioning is above average, the player 2.2 has a more rational approach to problems. He is not pressed by the expectations of other people; he is not scrupulous, but an independent personality. He plays for pleasure and for significant material benefits that he wants to obtain. He plays for this club because there is no better alternative. Since the club has inadequate means, he is dissatisfied and does not do his best either physically or emotionally. Until the financial aspect is changed he cannot be expected to invest more effort. His advantages are his height, strength, shot preciseness, good coordination of movement, and cooperativeness. His potential allows him to meet the expectations of the Coach in the centre position.

The player 2.11 perceives himself as a high quality player but intellectually he functions below average. The Coach's expectations are very low. Sociometric testing has shown that he is very unpopular in league playing and practice sessions and that the team would not miss him much. Due to his high tolerance to insults, high self-esteem and emotional stability he could be a useful player for practice sessions. He goes in for basketball due to his love for it.

The player 2.14 comes from a family of athletes, his idol is his uncle; he goes in for basketball because he loves it and is fulfilled by it. He is member of the club exclusively due to the club quality; he is not affected by insults and has high self-esteem. All these advantages show that he is fully committed to basketball. However this player is overworked (he also goes in for body-building): he does not get enough rest and therefore does

not achieve adequate results, which makes him emotionally and physically exhausted and dispirited (his third life priority is sleeping!). His achievement in practice sessions and games does not correspond to his potential. He has to be explained that he cannot get rid of tiredness by regularly taking vitamins and proteins but that he has to rest to improve his endurance (the main reproach by the Coach is that he is not strong). He could be a good playmaker because he is creative, well-coordinated, fast, precise, and adaptable to new people; he plays well even when away from home and is also highly motivated.

The player 2.16 is popular in league playing and in practice sessions, although he has more strengths as a basketball player (not at all affected by insults, least of all the team members, extraverted, enjoys his relationship with the audience, satisfied with interpersonal relations, practising makes him happy). He would like the Management to have greater expectations from him (he correctly notices that their expectations are lower than Coach's expectations). In any case he will be one of the future first five players. He would be good as a forward as he is satisfied with his shot preciseness, he does not feel bad about making a mistake, he does not analyse his behaviour too much. When he has fewer obligations at school, which prevents his total commitment to basketball, this player can positively surprise the entire club, especially the Management who have made an entirely mistaken low evaluation (2) of him. The player is satisfied with interpersonal relations in the club, but is still less attractive than his brother in play and practice.

The player 2.15 is the most popular for league playing (as well as 2.17), but is generally dissatisfied with the club and the Coach and would like to change everything in their work. He became member of the club after the downfall of his former club. Financial benefits are important (he thinks that he is offered very modest pay and that he gets practically nothing from the club). He is an emotionally stable person, but to some extent introverted, he does not make friends readily, he is not very talkative, he is frequently guilt-ridden, he frequently changes his mood, he is not interested in relationship with the audience,

he is right-minded and does not tend to boast about achievements that are not his. Generally he is not affected by insults because nobody insults him, but he would be most affected by an insult coming from the Coach, less by one coming from teammates, and least by insults coming from opponents. It is indicative that he wants a happier life for himself. He also cannot define his feeling after the practice session. He loves basketball and is not interesting in anything except it. He should be made emotionally attached to the club and taught not to be bothered by the past and the mistakes made in previous games. The coach should try to become closer to him and show an interest in him as a person. He would be good in the position of the shooting guard (he is satisfied with his shot preciseness, creativity, cooperativeness, he has the necessary height and weight), but he has to become emotionally attached to the club. The Coach gives him a higher mark than to other players.

The player 2.17 is the best choice for the team leader, he is the most popular player both for league playing and practice sessions. The Coach expects most from him, evaluates most highly his sense for leadership, and the player justifies the expectations. He is not affected by the insults coming from opponents, he enjoys good relationship with the audience, he adapts well to new people, he is creative, cooperative, attends practice sessions daily, affirmation is important for him and he expects progress. He holds that players' dissatisfaction with the club Management can be easily eliminated, the management only have to learn the names of all players and spend more time getting to know them and getting familiar with athletic conditions in the club. Although he is well aware that the club cannot provide better financial benefits at the moment, this aspect is important for him because he wants to make a fortune and achieve fame in basketball. If better conditions were offered elsewhere he would leave the club because he is not very satisfied with interpersonal relations either.

The player 2.8 has all the predispositions for a good centre (height, endurance, cooperativeness, maximal basketball potential and intelligence estimated by the Coach, is not

prone to injuries). The Coach's expectations are justifiably very high. The player is critical of himself and of other players (he has no idol), although his self-esteem is average his self-evaluation is not as good as his evaluation by the Coach and the Management. Therefore he is willing to practise more and improve himself. The club has recruited him because of his quality (this is his fourth club). He is well aware that the club's expectations from him are high, but he is mistaken in his perception of the Coach's satisfaction with his play. Therefore the Coach has to inform him about his flattering appraisal. The player does not see himself as an easily insulted person, especially if insulted by opponents, but he would be most sensitive to an insult by the Coach. As he plays for money he would be more satisfied if his financial status might be improved. He is not popular in leisure activities as he is not in a habit to go out, he is wilful, and he has more pocket money than anybody else, so other players may have different preferences for leisure activities. His attitude to his own life is ambivalent.

The player 2.1 is very promising and fulfils the high expectations of the Coach. He is an ambitious person (he wants both to obtain a university degree and play basketball professionally) and he is aware of the need for self-development. Emotionally stable and with high self-esteem, he is not prone to injuries. He plays basketball because he is fond of it, and after practice sessions he feels happy and proud. He is in this club due to the results achieved by the club; this is where he started to play and where he has made his best friend. He is emotionally attached to the club, so the Management need not worry about his abrupt leaving (although he is not satisfied with the Management). He thinks that the Management should contribute to better sport conditions in the club. He does not consider himself sensitive to insults, but in such situations he would be very sensitive to insults coming from opponent players, therefore he needs help to learn that being sensitive to insults is unreasonable and only helps his opponents. He would be excellent in the position of the shooting guard. The coach highly appreciates his speed and shot

preciseness, while he himself is fairly satisfied with them.

The player 2.18 meets the expectations of the Coach and would be excellent in the forward position (he has the best evaluation for speed by the Coach, and he himself is maximally aware of his speed, cooperativeness and creativity). In brief, the player's and the Coach's assessment of efficiency are identical. Although his fitness is not adequate, the player is aware of that and concludes that he should take more practice. He holds that the audience appreciates his playing, but he does not like contact with the audience. He perceives that he does not play so well away from home but he is not at all sensitive to insults coming from opponent players. It should be investigated what bothers him in the contact with the audience, and then he should be trained to disregard them. He plays basketball because he loves it. He thinks that the Coach should be dominant with his practical and theoretical knowledge, while the Management should be more familiarized with basketball in order to gain his trust. He is not satisfied with interpersonal relations and consequently other players do not feel a liking for his league playing, and he is not very popular in practice sessions. The player should be observed and advised in social terms in order to eliminate his inadequate behaviour. He wants to present himself in a socially desirable light and will certainly be anxious to improve his behaviour.

In terms of sociometric testing, the player 2.13 ranks third in popularity for league playing, practice sessions, leisure activities, socializing and closeness. He is satisfied with interpersonal relations, but is inclined to aggressive behaviour. He thinks that he should practise more, but does not have enough time for it due to school obligations and his girlfriend (who is most important in his life as he wants to get married and have two children). The problem is that he feels depressed after practice sessions, which indicates that he expects more from himself and that he is exhausted. He should be additionally motivated for basketball playing, made aware of his strengths (speed, cooperativeness, preciseness, endurance) and used as a shooting guard. He cannot be the first alternative because of his weaker potential, but in case of the first

alternative's injury he could be used as a substitute because he is not prone to injuries and he wants to gain recognition (as an average A1 league player).

The player 2.4 wants to develop not only in basketball but also in football, and he thinks that he can be more efficient. It is evident that he is not fit enough (it is also the Coach's estimate), but he invests a lot of effort (12 hours a week in the club and 6 hours on his own). The practice sessions exhaust him but he enjoys them, while his problem is his inclination to injuries and to bronchitis. As he goes in for both basketball and football (which due to its aggressiveness may be the cause of his injuries) it is only natural that he is exhausted, therefore he should be directed to play only basketball. He should be explained that his hopes to achieve great success in both sports are unreasonable. He is worried about the financial situation in the club and also by the Management's attitude towards juniors/cadets. He holds that they are neglected, and since this player is intelligent above average the Management should take this remark into consideration. He cannot play among the first five due to his weaker performance away from home, but he should certainly be retained for practice sessions (this is his fifth club, he is here due to his quality) and for possible substitution of the centre (good height, good playing potential, popularity among teammates). This player could be a nice surprise for the Coach and the Management if he commits himself only to basketball, and if he is offered better conditions. In his opinion, the Coach should show more respect to other players.

The player 2.5 is evaluated as mediocre by the coach and the Management does not state anything on their expectations from him. His intellectual functioning is below average, he is anxious about his bodily functions and his health, and he suffers from mild depression. He is very prone to injuries and infective diseases, he suffers from somatic anxiety and takes medication regularly, he is hard to adapt to new people and as such is not suitable for league playing. He can be useful only for practice sessions as he is not sensitive to insults although he is sometimes insulted by other players. He goes in for basketball because he is interested in

it, and he is very popular among his teammates for practice sessions. For him practice sessions are the source of joy and pride. He is enduring, cooperative and well-coordinated. He should also be member of the team due to his greatest popularity in leisure activities and socializing. The player is neither adventurous nor outgoing; he is not impulsive and presents himself in a socially desirable manner.

The player 2.7 obtains the lowest evaluation by the Coach. He is most dissatisfied with the Coach, the Management and interpersonal relations. His motivation is very low, he plays for fun. Recognition is not so important for him, all he wants is to have some fun and thus perhaps achieve success. He does not invest much effort in basketball and does not know what to think about his achievement. His relationship with the Coach is poor, he is prone to aggressive behaviour, he likes to mock and upset others; he lacks empathy and emotional stability, but is highly extroverted and impulsive. His intellectual functioning is below average, during games and practice sessions he is frequently insulted, especially by the Coach. He thinks that the Coach inhibits him. He is rather unpopular among teammates for league playing, practice sessions and leisure activities, and as such he is completely dispensable to the club.

The player 2.12 is most satisfied with the Coach but he is ambivalent to financial status. He is not inclined to injuries and enjoys practising. However, he is not suitable for league playing due to his maximal sensitivity to insults by opponents. He does not like the audience, and is prone to malingering. Although he cannot meet the high expectations of the Coach and the management, he can be a good player for practice sessions (popular among teammates).

The player 2.9 is totally committed to basketball, and among all the teammates he practices most. Of good health, maximally motivated and committed to sport. He is most satisfied with the Coach, the Management, interpersonal relations, and satisfying of needs. Although highly evaluated by the Coach and the Management he cannot meet their high expectations due to his below average intellectual functioning. He is very adaptable to new people but dislikes contact with

the audience. He is popular among his teammates for practice sessions and should be retained by the club due to his good characteristics (speed, endurance, creativity, cooperativeness, and shot preciseness) as a good player for practice sessions. His adventurousness, extrovertedness and impulsiveness are reduced, and it is a real pity that so is his intellectual functioning.

For resolving the complex problem of team underachievement, and to have the good diagnosis of organizational situation it should include numerous variables. Namely, without a good information basis it cannot be given good answer on the question: "What should be done?" According to the literature review and researcher experience, this study deals with different types of data: demographic data, standardized and non-standardized psychological data, socio-metric data and direct observations data from the field. Such approach is needed to organize good information basis for scientific/professional based organizational consultancy.

To prevent the team achievement crisis, and to resolve the crisis when it occur it should have knowledge about each player (to know where each player can give his optimum, and know his strengths and weakness), and about team cohesion i.e. motivation. To have best results from Action Research methodology it should be used in the systematic and long term way, because organizational consultancy cannot give good answer without properly understanding the organizational situation. Namely, to understand and change (improve) an organization we need knowledge about causes of problems and knowledge about organizational reality - this means numerous information about different variables. According to the collected and analysed information about each player, can be given the answer about the structure (which player should play on which place) of the winning team.

8 CONCLUSION

According to the problems of the basketball club in crisis, to change this situation it is adopted the methodological approach of Action Research. So in accordance with the set problems in the

basketball team, the solutions are determined in the following manner:

Ad 1) The problems of the club Management are identified. They involve players (their dissatisfaction) and the Coach (who is unprepared for the task as he has not succeeded in building up good relationship with players and has not established true authority and leadership).

These problems are solved by making the interested parties (Management, coach and players) confront at a meeting and each commit to doing their part of the job.

Owing to this the team wins two games out of three, overcomes the acute crisis and gets a reasonable chance to remain in the league.

Ad 2) The survey determines the problem of the Coach (lack of trust and discipline among players). His problem is partly solved at the meeting when all the misunderstandings are discussed and initial trust of players is established by a vote of confidence. In terms of leadership, the Coach is advised about the ways of establishing control.

Ad 3) The problems of players are detected by psychological measuring instruments. For the senior team it is found that team cohesion and team spirit are disrupted. A psychosocial database is created for each player which allows concrete suggestions to be provided for the club management. The same is done for the junior/cadet team. Due to the perceived weaknesses in some functions of human resources management (recruitment, selection, evaluation of players' potential and performance, promotion of players to particular positions, motivation and rewarding by applying individualised approach to each player) some structural interventions are suggested (in the senior team and in the supporting junior team). This leads to the design of a model (procedure) for dealing with result and structural crises in sport teams that is the adapted application of Action Research methodology.

In the concrete practical example the diagnostic procedure and corrective activities are completed, while the basketball club is directed to have periodical sessions in accordance with the

perceived needs and abilities of the club Management. This study resulted in the presented model (procedure) for solving not only acute crisis but also structural problems in the sport teams. Winning team creation in acute phase means knowledge by which the problem can be resolved in short term time, and winning team creation which has structural problems means knowledge what is needed to resolve the problem in longer term of time. For achieving the best results in terms of preventing and resolving the crisis situations it is highly recommended the Action Research methodology. Action Research methodology starts from the diagnosis of present situation which is often complex with numerous variables. Therefore researcher must be involved in the organization reality, should know the potential causes of the problems – what is not an

easy task for researcher who has limited time and resources. But to know the organizational situation, to understand the organization as prerequisite for action (improvement) there is often no other good way. Therefore good scientific/professional answer on the question: "What shall we do?" cannot be given without broad information basis and knowledge what is crucial for success in short and long term time. In this study acute (short time) problem was the result crisis (i.e. motivation) which needed some type of motivation stimulation, and structural (long term) problem was the structure of the winning team which needed broader and deeper study.

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9 APPENDICES

9.1 Appendix 1

General questionnaire for basketball players

Name:

Date of birth:

Place of birth:

Address:

Education:

Current profession:

Financial status:

- a. dependent (Who supports you?)
- b. independent
- c. a and b

State the monthly amount of money available to you:

- Marital status:
- Number of children:
- Height:
- Weight:
- Smoker: YES/NO (If YES how many cigarettes a day?)
- Do you drink alcohol? YES/NO (If YES how much a day?)
- Do you take any regular medication: YES/NO (If YES what kind?)
- When did you start playing basketball?
- Family tradition in sports: YES/NO (If yes which one?)
- Have you played for other clubs? YES/NO (If YES which ones?)

The following questions are answered by the five degree Likert scale:

not satisfied at all; not satisfied; neither satisfied nor dissatisfied; satisfied; very satisfied.

- Are you satisfied with your life?
 - Are you satisfied with your financial status in the club?
 - Are your sport needs satisfied by the club?
 - Are you satisfied with interpersonal relations in the club?
 - Are you satisfied with your relationship with the Coach?
 - Are you satisfied with your relationship with the Management?
1. State what could be improved in your relations with the Coach and the Management.
 2. State your reasons for playing basketball.
 3. Why do you play in this club?
 - a. Because it is close to my home
 - b. Due to its quality
 - c. Because persons close to me play here
 - d. Because of the pay
 - e. Something else (State what:)
 4. Do you find recognition in this sport important to you?
 - a. Not important at all
 - b. Not important
 - c. Neither important nor unimportant
 - d. Important
 - e. Very important
 5. What would you like to achieve in this sport?

- | | | | | | |
|--|--|---|--|---|--|
| <p>6. Do you have an idol in basketball? (If YES who?)</p> <p>7. Do you have any idols in life? (If YES who?)</p> <p>8. Which are your activities besides basketball?</p> <p>9. Rank your activities by their importance for you.</p> <p>10. Do you aspire to anything else besides your development in basketball? YES/NO (If YES state to what.)</p> <p>11. How many days and hours a week do you practise basketball?</p> <p style="padding-left: 20px;">a) obligatory practice sessions in the club</p> <p style="padding-left: 20px;">b) individually</p> <p>12. Do you think that is adequate for you? YES/NO (If YES explain.)</p> <p>13. Do you believe that you can realize high achievement in basketball?</p> <p style="padding-left: 20px;">a. I don't believe that at all</p> <p style="padding-left: 20px;">b. I don't believe that I can realize particularly high achievement</p> <p style="padding-left: 20px;">c. I neither believe nor disbelieve that</p> <p style="padding-left: 20px;">d. I believe in high achievement</p> <p style="padding-left: 20px;">e. I am completely convinced that I can realize high achievement</p> <p>14. Is there a problem in your life that prevents your doing your best while playing? YES/NO (If YES state what it is.)</p> <p>15. If you have problems do you think that the club can solve some of them? YES/NO (If yes state which ones.)</p> <p>16. How highly do your teammates and the Coach evaluate your play?</p> <p>17. Are the people from your close environment satisfied with your performance in basketball? YES/NO</p> <p>18. How much is your activity in basketball supported by your family?</p> <p style="padding-left: 20px;">a. They are not supportive at all</p> <p style="padding-left: 20px;">b. They are not supportive</p> <p style="padding-left: 20px;">c. They are neither supportive nor unsupportive</p> <p style="padding-left: 20px;">d. They are supportive</p> <p style="padding-left: 20px;">e. They are very supportive</p> <p>19. In your opinion, how high are the Club's expectations from you?</p> <p style="padding-left: 20px;">a. Very low</p> <p style="padding-left: 20px;">b. Low</p> <p style="padding-left: 20px;">c. Neither low nor high</p> <p style="padding-left: 20px;">d. High</p> <p style="padding-left: 20px;">e. Very high</p> <p>20. Would you change anything in the club's operation? YES/NO (If YES, explain what.)</p> <p>21. Do you socialize with your teammates beyond sport activities? YES/NO</p> <p>22. Is your best friend in this club? (YES/NO) Is he connected with basketball? YES/NO</p> <p>23. Do your teammates respect you as a person?</p> | <p style="padding-left: 20px;">a. They don't respect me at all</p> <p style="padding-left: 20px;">b. They don't respect me</p> <p style="padding-left: 20px;">c. They neither respect me nor disrespect me</p> <p style="padding-left: 20px;">d. They respect me</p> <p style="padding-left: 20px;">e. They admire me</p> <p>24. Do your teammates criticise you if you do not play well?</p> <p style="padding-left: 20px;">a. They criticise me so much that I can hardly bear it</p> <p style="padding-left: 20px;">b. They criticize me</p> <p style="padding-left: 20px;">c. They do not have any objections</p> <p style="padding-left: 20px;">d. They encourage me</p> <p>25. Do your teammates insult you? YES/NO</p> <p>26. If yes, how often:</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>A) DURING PRACTICE SESSIONS</p> <p style="padding-left: 20px;">a never</p> <p style="padding-left: 20px;">b almost never (less than 10% sessions)</p> <p style="padding-left: 20px;">c infrequently (in 10-30% sessions)</p> <p style="padding-left: 20px;">d averagely (in 30-50% sessions)</p> <p style="padding-left: 20px;">e frequently (in 50-70% sessions)</p> <p style="padding-left: 20px;">f almost always (in 70-100% sessions)</p> </td> <td style="width: 50%; vertical-align: top;"> <p>B) DURING THE GAME</p> <p style="padding-left: 20px;">never</p> <p style="padding-left: 20px;">almost never</p> <p style="padding-left: 20px;">infrequently</p> <p style="padding-left: 20px;">averagely</p> <p style="padding-left: 20px;">frequently</p> <p style="padding-left: 20px;">almost always</p> </td> </tr> </table> <p>27. Does the Coach insult you? YES/NO</p> <p>28. If yes, how often:</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>A) DURING PRACTICE SESSIONS</p> <p style="padding-left: 20px;">a never</p> <p style="padding-left: 20px;">b almost never (less than 10% sessions)</p> <p style="padding-left: 20px;">c infrequently (in 10-30% sessions)</p> <p style="padding-left: 20px;">d averagely (in 30-50% sessions)</p> <p style="padding-left: 20px;">g frequently (in 50-70% sessions)</p> <p style="padding-left: 20px;">h almost always (in 70-100% sessions)</p> </td> <td style="width: 50%; vertical-align: top;"> <p>B) DURING THE GAME</p> <p style="padding-left: 20px;">never</p> <p style="padding-left: 20px;">almost never</p> <p style="padding-left: 20px;">infrequently</p> <p style="padding-left: 20px;">averagely</p> <p style="padding-left: 20px;">frequently</p> <p style="padding-left: 20px;">almost always</p> </td> </tr> </table> <p>29. Do your teammates see you as a basketball player only or as a complete person?</p> <p>30. What is your relationship with the audience?</p> | <p>A) DURING PRACTICE SESSIONS</p> <p style="padding-left: 20px;">a never</p> <p style="padding-left: 20px;">b almost never (less than 10% sessions)</p> <p style="padding-left: 20px;">c infrequently (in 10-30% sessions)</p> <p style="padding-left: 20px;">d averagely (in 30-50% sessions)</p> <p style="padding-left: 20px;">e frequently (in 50-70% sessions)</p> <p style="padding-left: 20px;">f almost always (in 70-100% sessions)</p> | <p>B) DURING THE GAME</p> <p style="padding-left: 20px;">never</p> <p style="padding-left: 20px;">almost never</p> <p style="padding-left: 20px;">infrequently</p> <p style="padding-left: 20px;">averagely</p> <p style="padding-left: 20px;">frequently</p> <p style="padding-left: 20px;">almost always</p> | <p>A) DURING PRACTICE SESSIONS</p> <p style="padding-left: 20px;">a never</p> <p style="padding-left: 20px;">b almost never (less than 10% sessions)</p> <p style="padding-left: 20px;">c infrequently (in 10-30% sessions)</p> <p style="padding-left: 20px;">d averagely (in 30-50% sessions)</p> <p style="padding-left: 20px;">g frequently (in 50-70% sessions)</p> <p style="padding-left: 20px;">h almost always (in 70-100% sessions)</p> | <p>B) DURING THE GAME</p> <p style="padding-left: 20px;">never</p> <p style="padding-left: 20px;">almost never</p> <p style="padding-left: 20px;">infrequently</p> <p style="padding-left: 20px;">averagely</p> <p style="padding-left: 20px;">frequently</p> <p style="padding-left: 20px;">almost always</p> |
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- a. They cannot stand me
- b. They do not notice me
- c. They approve of me
- d. They flatter me
- e. They are euphoric about me
- 31. Are you in any way pressed by the Coach or the club Management? YES/NO (If YES, explain.)
- 32. Are you pressed by anybody from your environment? YES/NO (If YES, who is it?)
- 33. Do you like contact with audience? YES/NO
- 34. Do you play worse away from home? YES/NO
- 35. Do you adapt easily to new people in the team? YES/NO
- 36. How do you feel after practice sessions?
 - a. Emotionally exhausted and depressed
 - b. A little depressed
 - c. Neither depressed nor happy
 - d. Happy and proud
 - e. Very happy
- 37. Have you got a partner? YES/NO
- 38. Have you got enough time for your family? YES/NO

The following questions are answered by the five degree Lickert scale:

not satisfied at all; not satisfied; neither satisfied nor dissatisfied; satisfied; very satisfied.

- 39. Are you satisfied with your fitness?
- 40. Are you satisfied with your speed?
- 41. Are you satisfied with your movement coordination?
- 42. Are you satisfied with your shot preciseness?
- 43. Are you a creative player?
 - a. I am not at all creative
 - b. I am not very creative
 - c. I am neither creative nor uncreative
 - d. I am creative
 - e. I am very creative
- 44. Are you cooperative in play?
 - a. I am not at all cooperative
 - b. I am not very cooperative
 - c. I am neither cooperative nor uncooperative
 - d. I am cooperative
 - e. I am very cooperative
- 45. Do you consider yourself a mature player or a developing player?
 - a. I am very young and have many years ahead to develop as a basketball player
 - b. I am young and I expect further development
 - c. I am neither a developing player nor a mature one
 - d. I am an experienced player
 - e. I am at the top of my career

- 46. Do you have any health problems? YES/NO (If YES, state which ones.)
- 47. Are you prone to injuries?
 - a. Very prone
 - b. Prone
 - c. Neither prone nor non-prone
 - d. Not prone
 - e. Not prone at all
- 48. Are your injuries of acute or chronic type?
- 49. Do you frequently suffer from recurring injuries? YES/NO
- 50. Do you frequently suffer from infectious diseases (cold, flu, viroses, etc.)?

Appendix 2

Questionnaire on Organizational-based self-esteem (according to Pierce, Gardner, Cummings and Dunham, 1989) adapted to sports teams

- 1. In the team everybody counts on me
- 2. In the team everybody takes me seriously
- 3. I am an important team member
- 4. I am a reliable team member
- 5. I am a valuable team member
- 6. I am an efficient team member
- 7. I am a cooperative team member
- 8. I am a useful team member
- 9. I am a trusted team member
- 10. I can make a change in the team.

Appendix 3

Questionnaire on sensitivity to insult according to Levar, A. (1996), adapted to sports needs.

Due to the insult repertoire (abusive language), the questionary is not published here. To get it, please, contact the Journal Redaction on e-mail: mest@meste.org or the author on his e-mail: mbogdan2011@gmail.com

Appendix 4

Contents of the questionnaire for Coaches adapted from the magazines Supersport of 28/08/1998. and Košarka of 30/08/1998.

- 1. Leadership
- 2. Creativity
- 3. Speed
- 4. Movement coordination
- 5. Endurance
- 6. Cooperativeness
- 7. Preciseness
- 8. Sport intelligence

9. Basketball potential

Appendix 5

Sociometric testing adapted to sports needs
 (Baker, 2003)

1. State the club members with whom you would most like to play the league.
2. With which club members would you not like to play the league?
3. With which club members would you most like to practise?

4. With which club members would you not like to practise?
5. With which club members would you like to pursue leisure activities (e.g. trekking, skiing, shopping, etc.)?
6. With which club members would you not like to pursue leisure activities?
7. With which club members would you like to socialize (talk about personal matters, go out together, etc.)?
8. With which club members would you not like to socialize?

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DESIGNING FEATURES OF ARCHITECTURE FOR ELECTRONIC CONTENT COMMERCE SYSTEMS

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Abstract

The article analyzes and summarizes the tools, information technologies and software of basic task analysis in electronic content-commerce systems. The functional scheme of electronic content-commerce systems are developing, using the module of information resources processing. The paper provides detailed descriptions of modular architecture elements, of the electronic content-commerce systems functioning, their objectives and principles of implementation. The article also explores the major functional elements of the system and presents the electronic content-commerce systems scheme of the most significant mechanisms. In the paper are analyzed sequence methods and models of information resource processing in electronic content-commerce systems. It also allocates the basic laws of the transition from commercial content formation to its implementation. Created formal model of electronic content-commerce systems allows to implement phases of the commercial content life cycle. For this purpose is developed a formal model of information resources processing in electronic content-commerce systems, allowing us to create a generalized typical architecture of electronic content-commerce systems. The paper shows generalized typical architecture of electronic content-commerce systems, which helped implement the processes of commercial content formation, management and realization.

Keywords: *information resources, content, content management system, content life cycle, electronic content commerce system*

1. INTRODUCTION

Main task of electronic content-commerce systems (ECCS) is to facilitate the information resources work of the moderators, authors,

analysts and administrators. The main goal of ECCS functioning is to improve the information resources functionality for users of the content. ECCS selected topical issues range in a content set from various external sources for moderators and authors according to their ranking through the commercial content formation subsystem. The author creates a commercial content according to automatically matched information

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analysis from various sources of actual content. He also updates the other sources addresses in the subsystem of commercial content formation. Analyst analyzes the target audience activity and ECCS functioning. As a result he develops new rules of statistics and dynamics analyzing of the commercial content lifecycle through commercial content support subsystem. These rules can increase the target audience range; the number of visitors; the unique visitor's number; repeated visits; the number of visits from search engines; direct visits number; regional visits number; thematic visits number, etc.

Basic infrastructure of electronic content commerce system (ECCS) is extended by more dynamic applications (interactive features): simple request form and content formation based on JavaScript for browser; API for Web-server (NSAPI and ISAPI), which allows the browser to execute the application on the Web-server; dynamic processing servers that convert content from database in HTML-pages (Bereza, Kozak, & Levchenko, 2002), (Berko, Vysotska, & Pasichnyk, 2009). Effective use of database management system (DBMS) requires the following in architecture WebOLTP: support unstable loads with tracking properties such as queues and priorities request; high-speed connection of the application to DBMS; applications queue and resource management as a the total amount reducing means of resources

in system order to achieve of stable performance within online transactions; securing, such as authorization (compliance) for WebOLTP-specific applications; distributed processing of query, taking into account various types of data in WebOLTP environment pages (Bereza, Kozak, & Levchenko, 2002), (Berko, Vysotska, & Pasichnyk, 2009). WebOLTP is managed dialog of requests processing (Online Transaction Processing OLTP), where the Web is an access means pages (Bereza, Kozak, & Levchenko, 2002), (Berko, Vysotska, & Pasichnyk, 2009). These applications are suitable for data viewing, but also for operational content processing in real-time, such as banking transactions, orders taking and analysis, interactive work with clients (Berko, Vysotska, & Pasichnyk, 2009).

2. PROBLEMS COMMUNICATION WITH IMPORTANT SCIENTIFIC AND PRACTICAL TASKS

The purpose of the article is modeling of information resources processing in ECCS. This allows general approach to design, construction and implementation of similar systems. Such problems solving promotes methods generalization and standardization of information resources processing in ECCS using stages of commercial content formation, management and support. This helps to reduce the construction time for a typical e-business systems building.

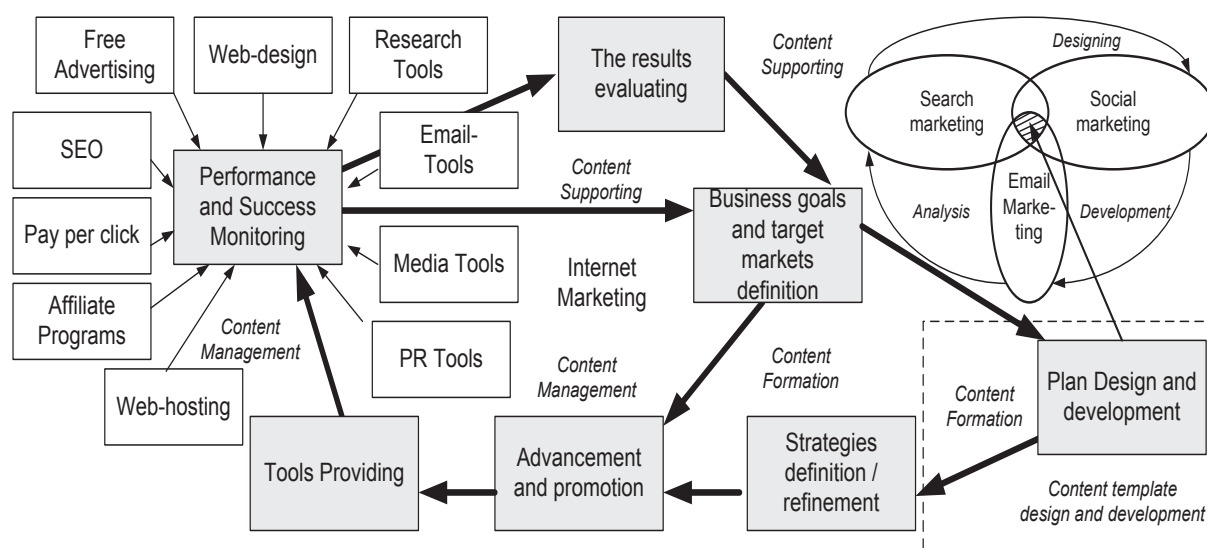


Fig. 1. Mechanisms application scheme of Internet marketing in electronic content commerce systems

Such systems implementation allows to reduce time in the production of its own commercial content, to analyze outdoor commercial content derived from external sources, to analyze the dynamics of content lifecycle, to analyze the statistics of the ECCS functioning, to analyze the statistics of user activity of information resources in the ECCS, to increase the target audience of information resources and to expand the feature set in ECCS. The result of modeling and development of information resources processing in ECCS is a set of functional requirements and standardized specifications for similar systems creating. The purpose of these requirements is to provide a generalized approach for ECCS developing as an online newspaper, online magazine, online publishing, distance learning, online shop for content selling in the form of electronic books, photos, videos, audio and more. The requirements standardization for the ECCS construction provides a generalized approach creating for developers of such systems. This reduces the time for such systems design and

implementation with the phase avoidance of the respective project development.

3. RECENT RESEARCH AND PUBLICATIONS ANALYSIS

The process of ECCS designing and creating is an iterative as Internet marketing result (Fig. 1). The unsettled question is the best technology selecting for WebOLTP-architecture design and for business logic the implementation and management at the intermediate level (Bereza, Kozak, & Levchenko, 2002), (Berko, Vysotska, & Pasichnyk, 2009). Here are the basic requirements for intermediate level software (Berko, Vysotska, & Pasichnyk, 2009): scale and performance when working with large number of users, sessions, transactions and connections with database; high performance connections of browser and back-end data store; support of rapid development and deployment WebOLTP-applications at an intermediate level; synchronous and asynchronous management of transaction through transaction servers of ECCS (Fig. 2).

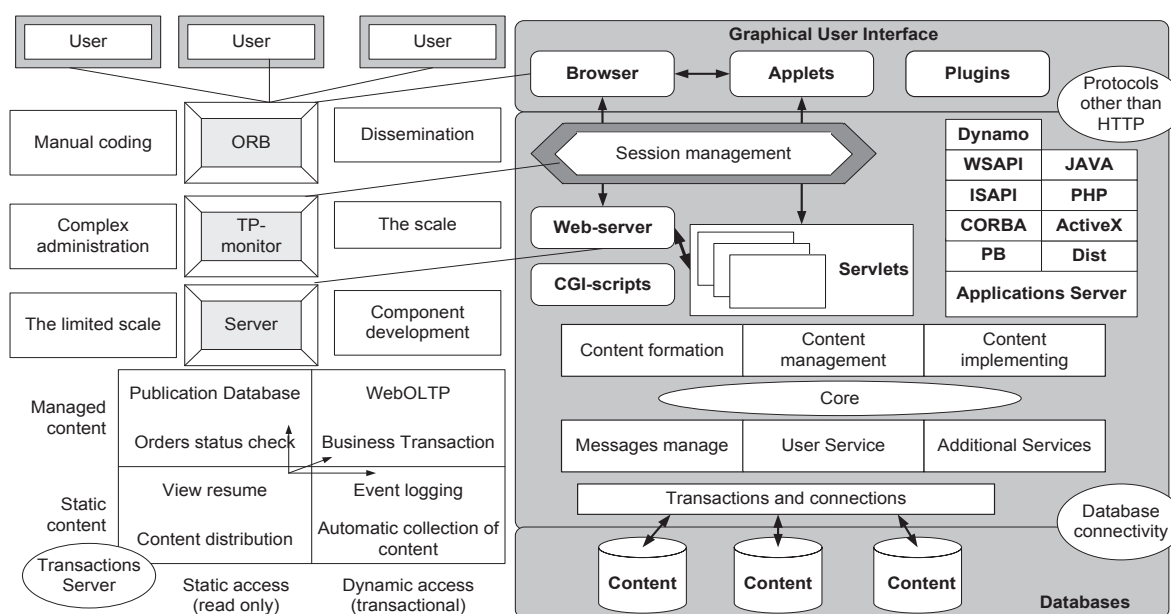


Fig.2. Basic infrastructure of electronic content commerce system

It contains a number of stages (from a plan analysis, design and development to a prototype build and experimental tests). This process begins with the specifications and layout formation, content template creation, content formation and its subsequent placement of

structures according to information resources (Bereza, Kozak, & Levchenko, 2002), (Berko, Vysotska, & Pasichnyk, 2009), (Bolshakova, et al., 2011), (Korneev, Hareev, Vasyutyn, & Reich, 2000), (Lande, Furashev, Braychevskyy, & Hryhorev, 2006), (Lande, Osnovy intehtratsii informatsyonyh potokov, 2006). In the initial

stages (before the functional requirements defining and the development process beginning) are involved regular users in the process through poll letters, alternative design and prototyping of varying degrees of readiness. Without much effort the valuable information are collected.

Transactions servers of ECCS is characterized by the following properties: they support built-in capabilities of transaction management; they provide a mechanism to execute and servlets management; they support the challenges of distributed objects for communication in multi-applications; they support rapid development tools of software for the intermediate level, including component development (Bereza, Kozak, & Levchenko, 2002) (Berko, Vysotska, & Pasichnyk, 2009). Basic indicators of connectivity include: generalized multiprotocol support for browsers and other network clients (HTTP, TDS for fast processing of content and protocol CORBA IIOP); connectivity with main DBMS, including Sybase SQL Server and SQL Anywhere, Oracle and MS SQL Server through ODBC, JDBC and Sybase Open Client standard; connectivity with the mainframe and other content sources through production of data access; high-speed connectivity with Java for applets and servlets; high-speed exchange of totals samples between all levels; efficient HTTP-tunneling to ensure compatibility with firewall (Bereza, Kozak, & Levchenko, 2002), (Berko, Vysotska, & Pasichnyk, 2009).

Content distribution systems are implemented by client-server model, because the vast majority of operations carried on the server (Berko, Vysotska, & Pasichnyk, 2009). This makes universal ECCS. The process of data transferring between the client and the server and the user interface of these data presentation are based on generally accepted international standards. This allows the use of information technology and software with different architectures and different methodologies for information resources processing, such as regular expressions. Structural elements of software and information technology to ECCS build (Berko, Vysotska, & Pasichnyk, 2009): communication protocols between client and server (HTTP, FTP, IIOP); HTTP- server integration with content source (CGI, Perl, PHP

and specialized API); hypertext capabilities implementation (HTML, WML, XML, XHTML, JavaScript); multimedia features implementation (Flash, audio/video formats, VRML); communication implementation and online interaction (POP, UDP, SMTP); payments support (PHP, Java); content management systems and services (CMS, CMIS); network management protocol for network OSI (CMIP); mobile access and computing organization (GPRS, EDGE, UMTS, WAP); distributed objects implementation and development (CORBA, COM, DCOM, EML, ORB); data storage and processing (file systems, operating systems, database management systems, systems for group work).

4. PROBLEMS SELECTION

Full-featured ECCS is characterized complex system of interrelated operations (Bereza, Kozak, & Levchenko, 2002), (Berko, Vysotska, & Pasichnyk, 2009), methods and techniques that form the technological process in such systems (Fig. 3).

New platform of the Internet development significantly reduces the loss risk, content duplication or re-creation of the search/find impossibility (Bereza, Kozak, & Levchenko, 2002), (Berko, Vysotska, & Pasichnyk, 2009). The control means of content versions ensures that the Internet portals content will not be lost or accidentally overwritten (Berko, Vysotska, & Pasichnyk, 2009). Editors can easily find the required version of the content and/or information resource. In business processes chaos and delays are not acceptable. A business process building based on user roles and groups implies their independence from delays of individuals' execution (Bereza, Kozak, & Levchenko, 2002), (Berko, Vysotska, & Pasichnyk, 2009). Roles and the processing of various information resources (eg, pictures and legal documents) are usually quite different.

Theme actuality consists of rapid prevalence of Internet access; active development of e-business; information products/services set expanding; demand for information products/services growing; theoretical justification methods; lack of information resources processing; a need for software

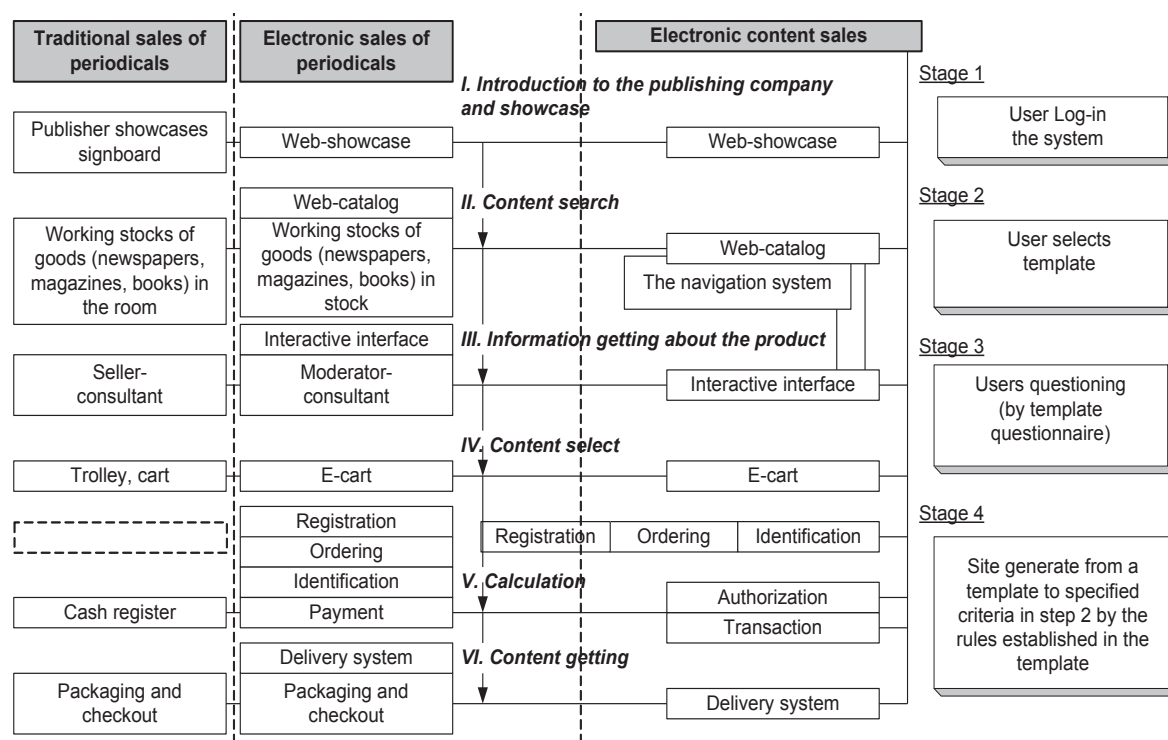


Fig.3. Process phases and stages of the e-commerce system operation

unification for information resources processing and active development of research in e-business of Google, AIIM, CM Professionals organization, EMC, IBM, Microsoft Alfresco, Open Text, Oracle, SAP corporations, and (Lande, Furashev, Braychevskyy, & Hryhorev, 2006), (Hartman, 2006), (Boiko, 2005), (Doyle, 2005), (Hackos, 2002), (Halverson, 2009), (McGovern, & Norton, 2001), (McKeever, 2003), (Nakano, 2002), (Rockley & Cooper, 2002), (Stone, 2003), (Vysotska & Chyrun, 2011).

5. GOALS FORMULATION

The aim of ECCS creation is to establish a common approach to design, construction and implementation of similar systems. The project implementation promotes methods generalization of information resources processing in ECCS through the stages of commercial content formation, management and maintenance of the time reduction in typical e-business systems building. The project implementation of ECCS development is aimed at: time reduction in the production of its own commercial content (Bereza, Kozak, & Levchenko, 2002), (Berko, Vysotska, & Pasichnyk, 2009); external commercial content analysis from other sources (Berko, Vysotska, & Pasichnyk, 2009),

(Bolshakova, et al., 2011), (Braychevskyy & Lande, 2005), (Korneev, Hareev, Vasyutyn, & Reich, 2000), (Lande, Furashev, Braychevskyy, & Hryhorev, 2006), (Lande, 2006), (Pasichnyk, Scherbyna, Vysotska, & Shestakevych, 2012), (Fedorchuk, 2005); the dynamics analysis of the commercial content lifecycle (Berko, Vysotska, & Pasichnyk, 2009) (Bolshakova, et al., 2011), (Braychevskyy & Lande, 2005), (Korneev, Hareev, Vasyutyn, & Reich, 2000), (Lande, Furashev, Braychevskyy, & Hryhorev, 2006), (Lande, 2006), (Pasichnyk, Scherbyna, Vysotska, & Shestakevych, 2012), (Fedorchuk, 2005); the statistical analysis of ECCS functioning (Clifton, 2009), (Sovetov & Yakovlev, 1998); statistical analysis of users activities of information resources in the ECCS (Bereza, Kozak, & Levchenko, 2002), (Berko, Vysotska, & Pasichnyk, 2009), (Clifton, 2009); the target audience increasing of information resources (Berko, Vysotska, & Pasichnyk, 2009), (Sovetov & Yakovlev, 1998) and the functional possibilities expanding of the ECCS (Bereza, Kozak, & Levchenko, 2002), (Berko, Vysotska, & Pasichnyk, 2009), (Sovetov & Yakovlev, 1998).

The project drafting result of ECCS construction is a set of functional requirements and standardized specifications for the similar

systems creation (Bereza, Kozak, & Levchenko, 2002), (Berko, Vysotska, & Pasichnyk, 2009), (Sovetov & Yakovlev, 1998). The purpose of these requirements is to provide a generalized approach for ECCS developing as online newspaper, online magazine, online publishing, distance learning systems, online shop for content selling in the form of e-books, photos, video, audio, etc. (Berko, Vysotska, & Pasichnyk, 2009). Functional requirements standardization for ECCS building provides a generalized approach creating such systems in order to reduce time in process of such systems implementation and introduction with the phase avoiding of the respective project development. (Bereza, Kozak, & Levchenko, 2002) (Berko, Vysotska, & Pasichnyk, 2009)

The aim is to build a model of the information resources processing in ECCS to the functional requirements which determine the subsystems of commercial content formation, management and support. Accordingly, this involves each of the actions that implement these subsystems. These action models must combine and synthesize them into a single coherent model. It should describe the requirements for the ECCS functioning in general.

6. RESEARCH RESULTS ANALYSIS

ECCS technology supports full or partial automation of business process. Content and tasks are transferred to the appropriate action from one participant to another according to the procedural rules set. ECCS describes, creates and manages the workflow (business process) using the software. It interprets the process description and interacts with workflow participants. Also, it causes a relevant software applications and tools as required. ECCS automates the business process rather than function. It implements the interaction rules of the process participants. These aspects are the main centers of losses due to its vagueness. This article is intended to create a common functional requirements and standardized specifications for the ECCS development. This is done by the stages optimizing of information resources processing in similar systems (Fig. 4). Functional requirements are developed for the subsystems of content formation, management and maintenance facilitates in the realization of typical architecture for ECCS.

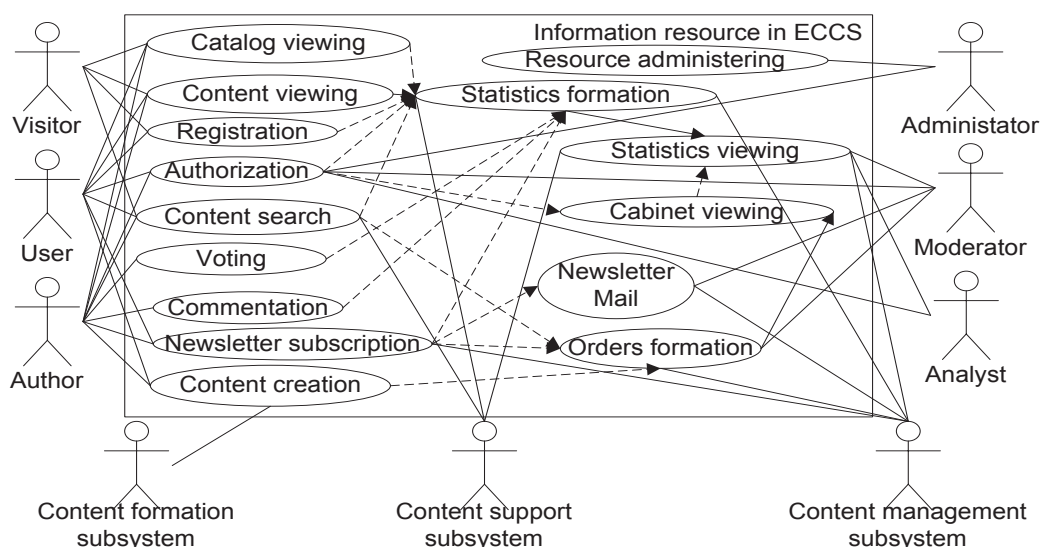


Fig.4. Use of Case Diagram for the development of project of electronic content commerce system

The process of official content management in e-business sold on the developing concept of their own ECCS. User and/or moderator must pass a certain number of steps to obtain the desired

content (articles, books, etc.) with the desired parameters. This steps implement a sequence of information resource management process (Fig. 5).

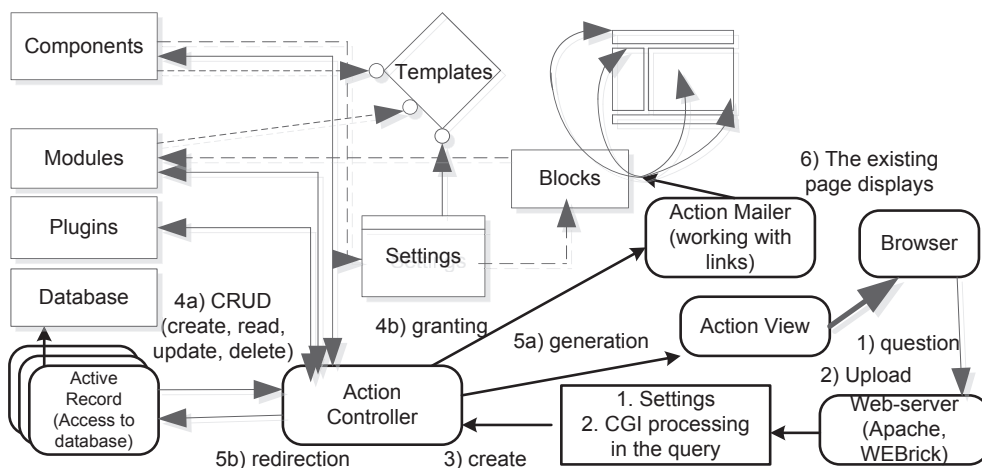


Fig.5. Diagram of content management diagram in electronic content commerce system

Stages of the content management process:

- | | | | |
|---|---|--|---|
| 1. URL-request with GET-parameter | 6. beginning of HTML-document structure formation | 11. request for cyclic processing of query | 16. completion of HTML-document formation |
| 2. page code receiving with GET-parameter | 7. the header forming query | 12. menu items output | 17. the process of content implementation |
| 3. CPO (current page object) initialization | 8. output in <title> title from CPO | 13. method invocation of content publishing from CPO | 18. content image recording |
| 4. request for record receiving with source | 9. start of content publishing | 14. query for content formation | 19. page output |
| 5. query of fields initialization for recording | 10. request for records receiving | 15. process of content formation | 20. pages viewing |

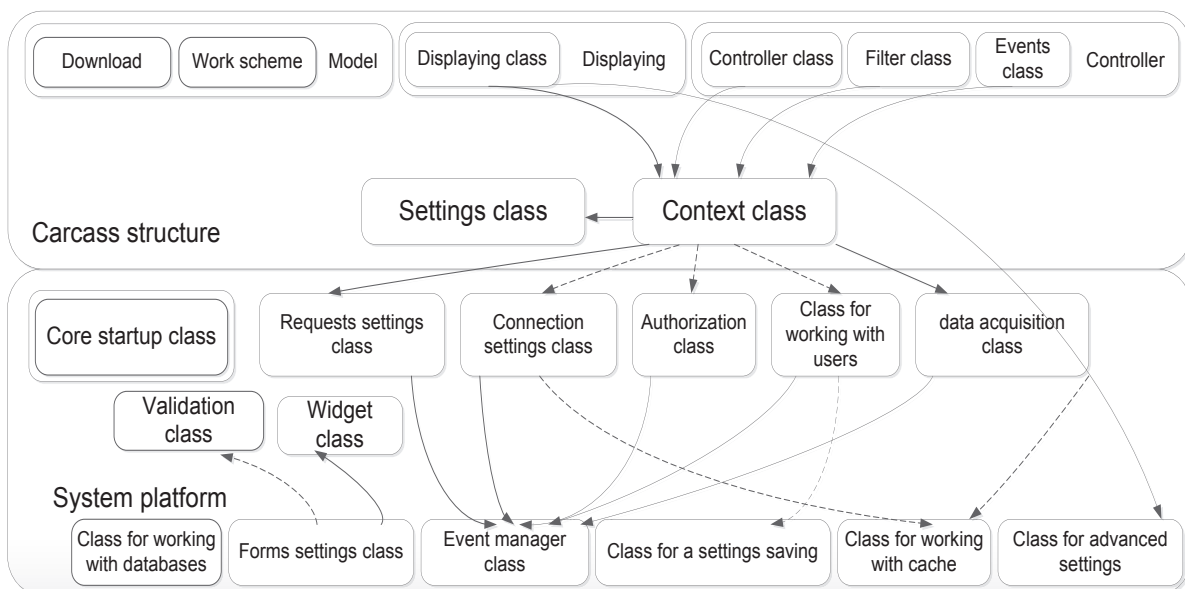


Fig.6. Diagram of the core structure in the electronic content commerce system

ECCS is actively used for the e-business implementation in information services with the active use of the Internet technology advantages. ECCS is designed to provide information services as Internet newspapers, online magazines, online

publishing, online markets for content and more. The ECCS can be applied to services of publishers, newspapers, magazines, news agencies, educational institutions, firms of software development or sales content without

carrier. The logical model of ECCS must not be changed until the events in the real world change. The necessary information is searched through the DBMS in the database based on physical models of data. Since the specified access is carried out by a particular DBMS, then the models should be described by data description language in this DBMS.

Fig. 6 shows the created abstract objects with properties and methods. Interaction with objects is realized through encapsulation. For this, there are implemented interface methods in classes that are designed for specific manipulations within the object of its data and properties. The database is implemented in an environment of MySQL. System administration is the administrative part. Access to it is limited and it is implemented by using login and password. In this part moderators make adjustments in the structure of the information resource, modify the content, change the static pages content, exercise messages mailing and content sharing between the parties of the business process, analyze visits to the ECCS and demand for thematic content. Software system administrator has unrestricted access to all parts and all the functionality in ECCS.

In Fig. 7 is presented database structure in ECCS with the basic set of entities. The main relevant components of database in ECCS are: attachments (new connected relevant), categories (information on the category to settings select), content types (information about content types settings), email_messages (messages email), file_blocks (information about uploaded files), group_sections (information about section structure of content group), group_types (information about number and types of content groups), groups (information about content group), html_blocks (information about Web-templates), page_routes (information about content in Web- templates), pages (information about created Web-pages), sites (information about the Web site structure), users (information about users and their preferences).

Template groups are intended for an interface creation between the user and the system. It contains HTML-pages layouts and/or their individual components using operators. ECCS transmits data of parser in representation of the desired content to the user. So, it executes the command to one or another template display. Parser replaces operators on the values of thematic content when the template is processing.

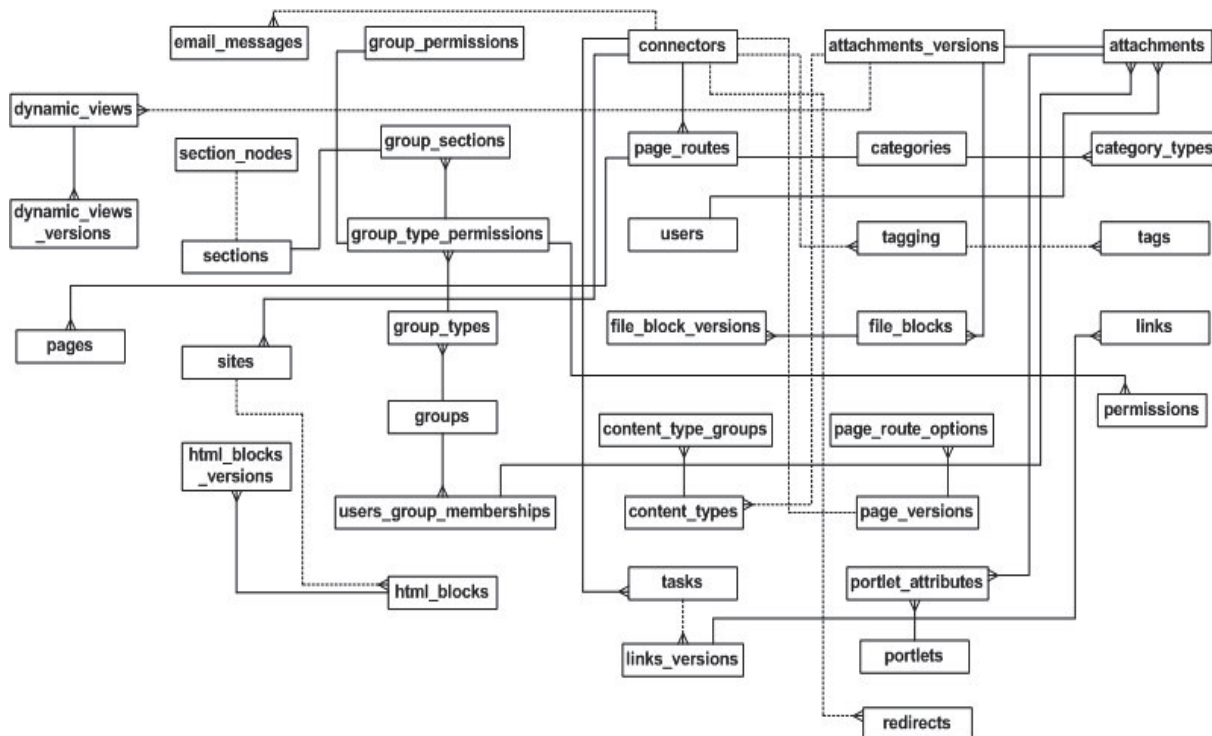


Fig.7. The database structure of the electronic content commerce system

ECCS design process is interactive. It flows from analysis to prototype and test trials creation. ECCS developing is concentrated on business goals solving and the needs of end users. Initially moderators analyze the end-users needs through poll letters, alternatives design and varying degrees prototypes to the functional requirements defining and the development process beginning. They also gather valuable operational / commercial content. At the same time it gives the people a sense of participation in the design process and their trust is won.

The moderators determine information about work groups, past/future conferences and all members of the community. Reactions of the users provide a clear and simple architecture of information resource and ECCS. There are several classes of information resource users (characters) in the ECCS: regular/potential customers/consumers, working groups managers, moderators, commercial content authors, ECCS operation analytics and administrators that define information resource design, ECCS structure and decision-making in

typical systems. The next step is to identify important operational content and how it relates to the main classes of users. Further on, it is necessary to create the content architecture of the information resource in ECCS, its hierarchy, presentation methods and interaction methods of each user class with this content. For example, the conference content includes the agenda and session question, these questions planning, conference topics and issues.

During the analysis they form additional functionality ECCS. For example, to support of active community added discussions and comments form on the information resources content, support for the contextual reverse reaction and interact interaction with users, use of the unique, but neutral brand or visual identity of proper e-business. Since the information resource is a neutral place of interaction between different users, strongly pronounced visual connection to the competitive and/or well-known company or environment causes adverse reactions.

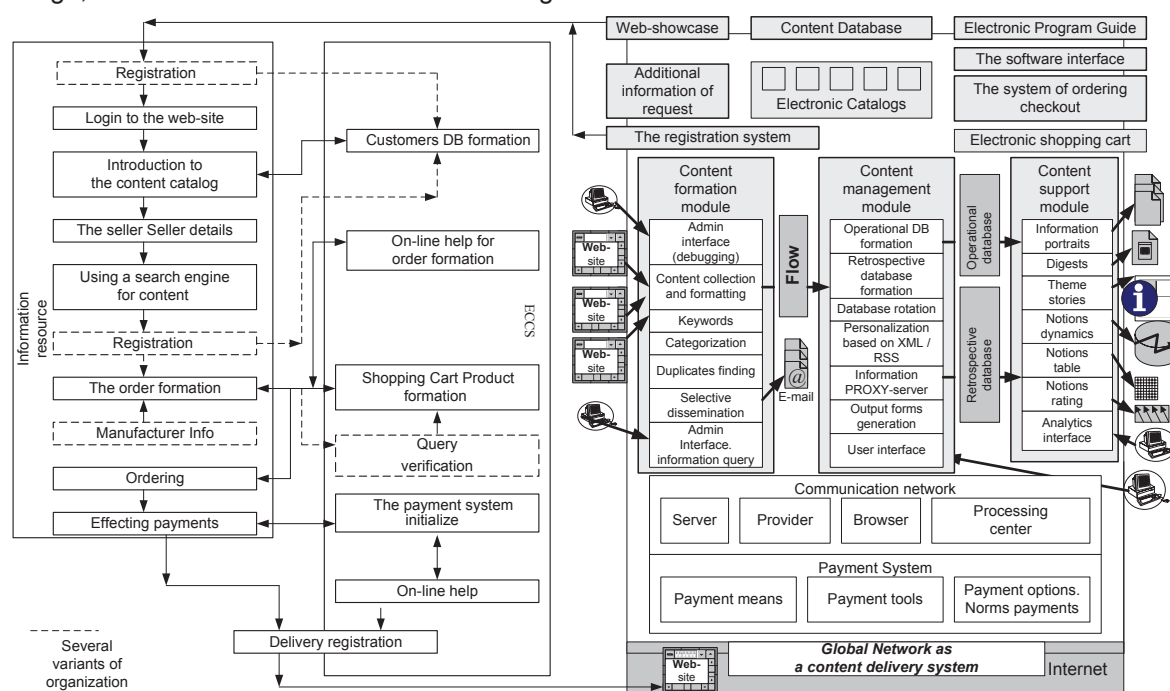


Fig. 8. Interaction scheme between the components in electronic content commerce systems

The main component of the project is the information architecture development. The first need is to define basic requirements for the project (access to content about the conference

or the audience) through monitoring users' performance and success. By users' response form the information architecture of the site (Fig. 8) according to the system type of content

trading. The main classes of users/personage site (clients, working group's managers and administrators) define information resources design and decision making process. They also determine important content and its connection with the main users' classes. Next moderators create site content architecture by electronic catalogs, its hierarchy, representation methods and each user's class interaction with this information (eg, conference data include topics and issues on the agenda and session planning of these issues).

There are several requirements for the ECCS development environment: the ability to make changes to the code and test amendments autonomously. After changes testing this code should be fully or partially accessible to the

group of developers, moderators, administrators and/or working groups managers according to the degree of confidence in them. This interactive cycle of developing makes using a remote version control system CVS. It allows synchronizing with team members of developing and manages the source code database of sharing. Centralized environment creates development and testing work to optimize code with other members of the group (time should be spend on code writing and testing, not on files and other system resources managing). The CMS model choice affects the need to use other tools. For example, in the case of Joomla! this means PHP, HTML and Cascading Style Sheets (CSS) using to develop pages and MYSQL for database.

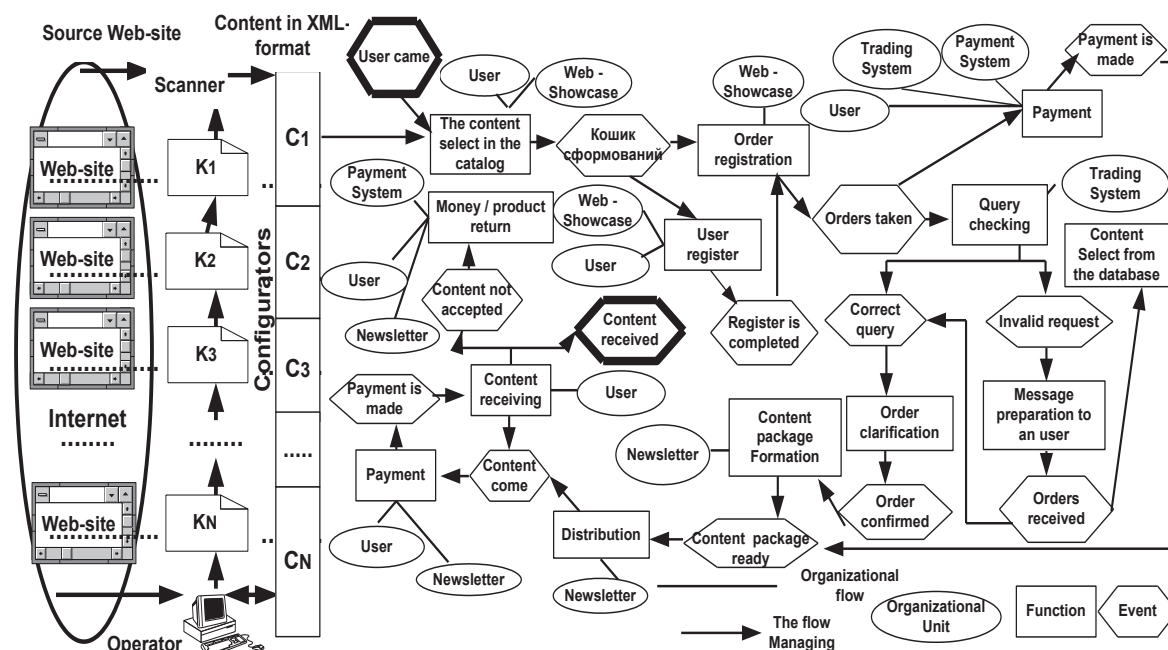


Fig. 9. General scheme of content management

ECCS management complex structure is implemented as three-tier client/server architecture. The content processing carried under the "client/server applications – databases". Request processed applications server. It communicates with the database and payment system at the same time. It also communicates content with relevant systems when connected to the business process of the organization. ECCS is a Web-showcase and trade system set (front-systems and back office). The main functions of ECCS are information of a

user, orders processing, payments, statistical data collection and analysis. Program complex of ECCS forms interface with user and functional capabilities of the system, based on the company needs. A potential user has the opportunity at any time to get answers to any question (after-sale service provided, consultation with features payment, etc.) that accompanies the buying/selling process. Registration/authorization occurs before/after choosing the content. In the first case a registry entry for regular users in ECCS. They are

realized by a special scheme of service and cost. Ability to register after the content selection allows the user to remain anonymous and saves time. The system secures the personally identifiable information user. Secure channel is used (SSL protocols or SET) for data transfer. ECCS receives complete content about visitors to the Web-site. This allows building in accordance with its marketing system.

Electronic catalogs are classified as common (supports a wide list of different items), commercial (focus on the characteristics of the market, suppliers, competitors) and specialized (dedicated to a narrow topic). In Fig. 9 a typical diagram of information resources processing in the ECCS is presented. The user/buyer fills in the form after content selecting, indicating payment/delivery method. Interaction is carried out over a secure SSL channel to personal content protect. The content gathered about the customer goes to the ECCS after the order formation and user registration. Then the system initiates a request to the payment system. In ECCS are formed delivery orderings after the notification on the on-line payments implementation.

CMS can collect statistical information up to analyze and to use it efficiently (find the position on the site, best for advertising information; automate the advertising campaign progress). Additional content publication is implemented using a single server of applications (publications area) and databases. ECCS uses information technology in the interaction with trading companies and retail buyers. It also provides sales and full lifecycle of commercial content. Workers composition in ECCS are much wider. It includes users (sellers, customers), financial institution numbers (the issuing bank, the seller/buyer bank, esquire bank), computer centers, etc. Users perform primarily natural persons as well as agencies, social institutions, other customers (legal entities). ECCS is to support content the lifecycle (Table 1).

Sellers in the ECCS are different organizational forms of trading content. Communication networks form providers, servers, processing centers and more. Delivery system form the corresponding exchange channels and Internet resources. All components interact in a system of relationships. This guarantee the ECCS

stability and reliability. Important elements of ECCS are the organizational forms of electronic content-commerce. They have a single focus – rocess providing of retail sale. But they differ in composition, structure, purpose of ECCS. Web-showcase belongs to the common organizational forms of content selling. It serves as an independent component or a part of ECCS. Web-showcase is a tool to attract customers and does not provide the full cycle of goods sale. This task performs the ECCS, which provides full range of interactively content purchase/sale through the Web an electronic catalog using. Electronic catalogs – a directory of content searchable for characteristics as name, designation, date, category, etc.; systematic content set of available navigation system).

Table 1. Content lifecycle classification

№	Stages of information resources processing		
	Content formation	Content management	Content supporting
1	Content collection/creation (data collecting from different Web-sites and formatting).	Content developing (databases formation, their rotation and access ensuring).	Content structuring (content themes identify, notions relationship tables build).
2	Content systematization (key words and notions identification, duplication, automatic categorization).	Content analysis (personalization and statistical analysis of users work).	Content moderation (information portraits and digests formation).
3	Content distribution (moderators ranking and selective distribution of content).	Content presentation (searches providing in the database, output forms generation, interaction with other databases).	Content generalization (notions ratings calculated, new events identifying, them tracking and clustering).

ECCS provides the catalog review, content categories choice, ordering, mutual implementation, the order tracking. ECCS is a hardware-software component for the operation: Web- showcase (front office) on the Web-server, e-catalogs, payment system, modules of content formation, management and support. Web-showcase has the active content, is static in

ordinary HTML-files or dynamic display of content from the database. Web-showcase contains information about the name, profile, status of ECCS owner, content and services range, payment means, discounts, warranties, terms of content delivery.

The process of processing information resources implemented as follows *content formation* → *content management* → *content support*.

$$S = \left\langle \begin{matrix} X, \text{Formation}, \\ C, \text{Management}, \\ \text{Realization}, Y \end{matrix} \right\rangle,$$

$X = \{x_1, x_2, \dots, x_{n_x}\}$ – input data set, *Formation*

– the operator of content formation,

$C = \{c_1, c_2, \dots, c_{n_c}\}$ – content set, *Management*

– the operator of content management,

Realization – operator of commercial content

support and $Y = \{y_1, y_2, \dots, y_{n_y}\}$ – set of output

data. Input variables x_i are independent and

content set c_j and output y_k are dependent.

Stage of content formation is described by the operator $c_j(x_i, t) = \text{Formation}(U_F, x_i, t, \Delta t)$ in

terms $U_F = \{u_{f_1}, u_{f_2}, \dots, u_{f_m}\}$. Stage of content

management is described by the operator $c_j(q_l, t) = \text{Management}(U_M, q_l, t, \Delta t)$ when

user requests prompted $Q = \{q_1, q_2, \dots, q_{n_Q}\}$

with terms $U = \{u_{f_1}, u_{f_2}, \dots, u_{f_m}\}$. Content

support stage is described as $y_k(t + \Delta t) = \text{Realization}(U_R, c_j, q_l, t, \Delta t)$ under

conditions $U_R = \{u_{r_1}, u_{r_2}, \dots, u_{r_z}\}$. Thus, the efficient

and adequate model establishment of the content formation, management and support, enables a uniform standardized approach for ECCS construction. This task performing, in turn, will greatly simplify and accelerate such systems creation and implementation.

Information resource in ECCS is a data plural with a properties set that are object to technology action for their transformation into content. The result of the same technology applying can be another information source. Content in information technology is formalized information and knowledge that placed in the

system environment. And, in contrast to the data, they are no detailed specification of their properties, methods of formalization and regulation. The one important problem of the ECCS construction and operation is different data convert (by nature, meaning and origin) in a consistent, centralized information resource. The procedure for information resources forming and using in ECCS determines data selection methods from primary sources, their fixation and filtering, conversion to the specified format for content create and location in the database. The content value determines its attractiveness to the consumer. Content integrating makes an attractive information resource and applications integration – useful. ECCS use does not require software installation. Moderators are using a browser for content editing and information resource administration. Intuitive interface and work simplicity with system facilitates the information resources management and reduce the further cost of content support. ECCS includes the following features: fast updates and search of content in information resources; data collect about permanent/potential customers; questionnaires creation and editing; visiting analysis of information resource.

A set building of formal models provides problem solving of the basic processes research, analyze and describe of information resources processing in ECCS. The purpose of each model is the manipulation, actions and transformations specification performed by a commercial content. The main processes in ECCS (modeling which is described in this paper) are commercial content the formation, management and implementation.

ECCS model is universal and easy to describe of typical systems operation. Models of information resources processing allow standardize of basic system functions as the content formation, management and realization. Based on the developed models, in particular, solve the problem of a typical architecture building of ECCS. Also for typical systems and their components form the specification of functional and non-functional requirements such as interaction means with the end user. In turn, in ECCS implement the procedures for content analysis, statistical data collection and processing of information resources visit. Models

of content the formation, management and implementation allow to simplify the process of ECCS designing through methods unification and standardization of information resources processing.

CONCLUSIONS

The authors develop software tools of the content formation, content management and content support. Design and implementation are the software of developed ECCS for the electronic content commerce organization with modules using information resources processing. General recommendations are elaborated for architecture design of electronic content commerce systems. They are different phases in more detail and the modules availability of information resources processing from the existing systems. This made it possible

to efficiently implement information resources processing at the developer level (time and resources decrease to the development, the quality improve of the electronic content commerce systems). The modules of architecture are elaborated in the electronic content commerce systems for the stages of realization of the commercial content lifecycle. The Authors have developed and implemented a software application of commercial content formation, management and support to achieve the effect of the work at the owner level (profitability improving, interest users increasing) and user level (clarity, the interface simplification, standardization, choice expanding) of the electronic content commerce systems.

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ENSURING OF INFORMATION PROCESSES' RELIABILITY AND SECURITY IN CRITICAL APPLICATION DATA PROCESSING SYSTEMS

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Summary:

The system approach to solving problems of information security, proposed in this work provides for the integration of mathematical models of the processing and protection of information. This model connects invulnerability and flexibility for each of three aspects of security (confidentiality, availability and integrity) of information based on structural unification of these contradictions. The method of modeling the security policy (SP) to provide a highly reliable information processing (HRIP) has been developed. This method differs by using a new problem-based graph-theoretic unit of standard model of the protected automated system for connection flexibility the discretionary model with the principled security of models of the final states of the SP. The mathematical models of synthesis of policy safe interaction of information processes, allowing SP to consider separately the various structural components of network with the ability to its further interlinkages have been developed. Using the new mathematical models of flexible reliability, availability, confidentiality and integrity of information processed, allowing mathematically describe the mechanisms to ensure the availability and confidentiality of the information and take into account the quantitative requirements for data integrity.

Keywords:

protection of information, data processing system, security policy, mathematical model, reliability

1 INTRODUCTION

The modern approach to ensure the reliability of information processes (IP) and its protection from unauthorized access (UA) is supported at the international level by standard ISO/IEC 15408.

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According to this approach, a reliable IP successfully counteracts to the specified threats of security at the given external conditions of its operation. This leads to continuous improvement as ways and means of information protection (MIP) as well as ways and means of implementation of threats to information security (IS), resulting that appearance of new MIP leads to its bypassing by means of attack (Ahmad, Dubrovskiy, & Flinn, 2005).

This, in its turn leads to the need for a new interpretation of the term "reliability of IP" that should be understood as a lack of security vulnerabilities, which can be a consequence of the implementation of the various unintentional and intentional threats.

This eliminates a number of inconsistencies in the definition of conflict MIP and attack.

In so doing, the reliability of IP should be characterized by its conformity to some reference security model (invincible) circulation (processing and transmission) of information. In this regard, there is a practical problem that such things are only partially implemented in practice and is not directly reflected in the relevant standards for architectural solutions of automated systems, such as transport satisfying the common reference models (Lahno & Petrov, 2010).

The reason lies in the fundamental theoretical difficulties of modeling technologies ensuring the reliability and protection of IP in automated data processing systems of critical applications (ADPS CA) occurring when you try to connect a promising approach to ensure the safety and protection of IP from UA with the flexibility of the protective mechanisms.

It should be noted that the ADPS CA are the result of the introduction of computer technology in the field of critical objects (military sites, environmentally dangerous production, nuclear power plants, objects of transport, communication, financial and credit sector, etc.), which are characterized as not acceptable to society damages for breach their performance. In ADPS CA, reliability of IP overrides its functionality. Moreover, it is preferred to use perspective approach (Chi, Park, Jung, & Lee, 2001).

Any model of the security policy (SP) to ensure the HRIP necessarily support the global SP characterizing the desired properties of IP (access syntax), and can support the local SP, which characterizes the transition rules of IP between the neighboring states (the semantics of access). Availability of support the local SP means dynamics of the appropriate model, and absence means the static. The dynamic model of SP, as opposed to static, imposes constraints on the state of IP.

2 FORMULATION OF THE RESEARCH PROBLEMS

The objects of the study, the results of which are presented in this article are HRIP processes with flexible protective mechanisms. The subjects of the study are methods and process models HRIP to ensure the prevention of its vulnerabilities against threats of intentional and unintentional nature and flexibility of the defense mechanisms.

The purpose of the study is the development of the theoretical foundations of HRIP process modeling providing both preventing its vulnerabilities against threats of intentional and unintentional nature and flexibility of defense mechanisms by integrating mathematical models of the information processing and protection.

This purpose required the solution of the following tasks:

- development of mathematical models of flexible accessibility, confidentiality and integrity of processed information;
- development of mathematical models and algorithms for optimal control of the integrity of processed information, while maintaining the effectiveness of this processing;
- development of a complex of problem-oriented programs of quality complex estimation of service operation of IC information.

2.1 Previous researches

In works (Ahmad, Dubrovskiy, & Flinn, 2005) the ways of HRIP improvement and enhance the protection of IP in ADPS CA. Depending on what system information considered IP flow, the modern approach to ensure their safety and

reliability is satisfied to a greater or lesser extent. A striking example of the weak satisfactory give ADPS CA on transport (Lahno & Petrov, 2011), and on this basis we shall discuss IP here.

Analysis of advanced technologies HRIP in the ADPS showed that prospective ADPS CA must use an object-relational database management system (DBMS). The relational data model as a theoretical basis of functionality of perspective object-relational DBMS CA together with associated models of information processing should be integrated with the advanced models of SP in a joint gauge model of safe circulation of information in the ADPS SP. Analysis of the existing approaches to the construction of systems of information protection from UA (SIP UA) in ADPS CA has shown that the use of traditional stand-alone SIP with the pursuit of their universality, in accordance with the concept of a padlock contradicts the prospective approach to ensuring the reliability and security of IP. The modern approach based on SIP UA satisfying protection profiles and security tasks, reflecting the possibility of countering known threats, to overcome a number of inconsistencies in the definition of confrontation means of defense and attack.

2.2 Management of information security

Analysis of existing methods of organizing process management of IP protection from UA to ADPS SP showed relevance of the task of organizational and technological service management of IC (Shun-Chieh & Shian-Shyong, 2004). It represents a problem of optimal control of IC service by automating its launch on performance criteria, providing the best IC while maintaining efficient operation of ADPS CA. However, this automation remains a problem even for those used in modern ADPS typical SIP UA. The analysis of the standardized evaluation method of the quality and efficiency of security systems services (SSS) as the software (SW) in relation to the specifics of organization of service management IC in ADPS SP showed the inadequacy of the characteristics of the properties of the service provided by IC as a control object. Therefore, it is suggested to introduce new features and sub characteristics –

the criteria of quality of service operation IC as a control object.

The analysis of existing methods of modeling processes HRIP in ADPS affecting the security of the information has allowed to choose basic graph-theoretic modeling unit of IP protection from UA in ADPS SP - E-networks unit.

Based on the analysis in the works (Harel, 1987; Ahmad, Dubrovskiy, & Flinn, 2005), the purpose and objectives of the research are defined. According to the proposed system approach, the main result of the formation of methodological bases of safety and reliability of IP in ADPS SP is a reference model of secure automated system (RMSAS) as an idealized model of ADPS SP implementing fundamentally safe technology of information circulation. Such model allows standardization of unified architectural appearance of different classes of ADPS SP by developing and registering for the regulation of safety standards. Regulated reference models of secure automated system (RMSAS models) of complexes of SP, joining the existing model of the final states with discretionary form, provide that any discretionary access can be realized only by uniquely defined sequence of transitions between the end states for which one can guarantee its safety.

3 ENSURING OF INFORMATION PROCESSES' SAFETY AND SECURITY IN CRITICAL APPLICATION DATA PROCESSING SYSTEMS

For the mathematical modeling of IP in ADPS, it is offered its formal representation by a known device of E-networks created in the development of the now-classic unit of Petri nets.

It develops the traditional graph formalization in the field by introducing a standard for the E-network unit of time delay procedures and permitting procedures. E-network representation of the dynamics of functioning in a typical MIP UA in normal ADPS CA and functioning of the IP dynamics in the reference ADPS has been developed (Harel, 1987).

However, due to the specificity of IP in the reference ADPS, the direct use for it such general formalisms inherent for E-networks is

little effective (Smirniy M. & Lahno V., 2009). Therefore, based on the E-networks unit has been built a new graph-theoretic unit of problem-oriented nature – RMSAS networks. Relying of an equivalent E-network representation, a proper specific syntactic representation of RMSAS networks by minimizing the descriptive means has been found – the canonical form of RMSAS network.

The composition of RMSAS network is defined as follows: L – Number of RMSAS network levels (usually $L=13$), $k = \overline{1, L}$, $l = \overline{1, L}$, $k \neq l$;

S – positions quantity, $S = Q \cup P \neq \emptyset$, $Q \cap P = \emptyset$, $|S| < \infty$, $|Q| = |P|$;
 Q, P – quantities of simple and permissive positions, $|Q| < \infty$, $|P| < \infty$, $Q = \bigcup_{l=1}^L Q_l \neq \emptyset$,
 $Q_k \cap Q_l = \emptyset$, $P = \bigcup_{l=1}^L P_l \neq \emptyset$, $P_k \cap P_l = \emptyset$;

Q_l, P_l – quantities of simple and permissive positions of the l -st level, $|Q_l| = |P_l| \neq 0$;

U – Quantity of modules, $U = \bigcup_{l=1}^L U_l \neq \emptyset$,
 $|U| < \infty$, $U_k \cap U_l = \emptyset$;

U_l – Quantity of modules of the l -st level;

$I(u) = i_1.i_2....i_{L-l}$ - index module $u \in U_l$ and unit, which this module is the upper (№ 0 in the unit), particularly, $I(u) = 0$ when $l = L$;

$K[I]$ – number of the lower modules in unit with index I ;

$I.j$ – index of the lowest module with number $j = \overline{1, K[I]}$ in the unit with index I ; if I, J – module indexes, then
 $(J \subset I) \Leftrightarrow (I \supset J) \Leftrightarrow (I = J.i_1.i_2....i_k)$,
 $(J \subseteq I) \Leftrightarrow (I \supseteq J) \Leftrightarrow ((J \subset I) \vee (I = J))$.

To specify the structure of the RMSAS network we introduce the notation:

N – quantity of number of authorization,
 $\alpha = \overline{1, N}$ – number of authorization;

$r = r[I, \alpha]$ – Boolean attribute of the admissibility of authorization α in the module with index I ;

$M_{in} = M_{in}[I, \alpha]$, $M_{out} = M_{out}[I, \alpha]$ – input and output functions of marking defining marking of input and output modules positions in form of a Boolean variable (indicate whether the position of the chip, and each item can contain no more than one chip).

The formal presentation of the RMSAS network module of given structure looks like

$$u = \langle I, q = q[I, \alpha], p = p[I, \alpha] \rangle \in U_l, \quad (1)$$

where $I = I(u)$ - index of module;
 $q = q[I, \alpha] \in Q_l$, $p = p[I, \alpha] \in P_l$.

Moreover, the formal representation of the structure of the network RMSAS is the next:

$$\varepsilon = \left\langle N, K = K[I], r = r[I, \alpha], \right. \\ \left. M_{in} = \dot{M}_{in}[I, \alpha], \dot{M}_{out} = \dot{M}_{out}[I, \alpha] \right\rangle. \quad (2)$$

Bringing into service of RMSAS networks opens the way for a systematic research of its mathematical properties as a development tool of ADPS CA based on the RMSAS. A fundamental step in this direction is the construction of using the unit of RMSAS networks modeling approach complex SP of the reference ADPS in the form of SP of RMSAS network.

Global (g) SP and discretionary of the l -st level are given as set of allowed positions: $\Psi_g \subseteq P_l$;

$\Psi_{dl} \subseteq P_l$, and leveled structure (l) looks like

$$\Psi_{ll} = \left\{ \langle I(u), \alpha, r[I(u), \alpha] \rangle | u \in U_l, \right. \\ \left. \alpha = \overline{1, N} \right\}. \quad (3)$$

Block SP (b) is given by installation of admissibility of evidence of various authorizations in all modules of the block, agreed to the following rules ($\alpha = \overline{1, N}$, $I = I(u)$, $u \in U \setminus U_1$):

$$(\exists_j \in \overline{1, K[I]})(r[I.j, \alpha] = 1) \Rightarrow; \quad (4)$$

$$\Rightarrow (r[I, \alpha] = 1)$$

$$(r[I, \alpha] = 0) \Rightarrow$$

$$\Rightarrow (\forall_j \in \overline{1, K[I]})(r[I.j, \alpha] = 0). \quad (5)$$

Local SP is given as follows:

$$\Psi_1 = \bigcup_{l=1}^L \Psi_{ll} = \{ \langle I(u), \alpha, r[I(u), \alpha] \rangle | u \in U, \alpha = \overline{1, N} \} \quad (6)$$

where all $r[I(u), \alpha]$ are mutually agreed to all blocks in accordance with the rules ($\alpha = \overline{1, N}$, $I = I(u)$):

$$(r[I, \alpha] = 1) \Rightarrow (\forall J \subset I)(r[J, \alpha] = 1), \quad u \in U \setminus U_L \quad (7)$$

$$(r[I, \alpha] = 0) \Rightarrow (\forall J \supset I)(r[J, \alpha] = 0), \quad u \in U \setminus U_1 \quad (8)$$

Discretionary SP is given by its permissive Ψ_{dp} or globalized Ψ_{og} representation:

$$(p[I, \alpha] \in \Psi_{\ddot{a}\ddot{a}}) \Leftrightarrow ((p[I, \alpha] \in \Psi_{\ddot{a}\ddot{o}}) \wedge \wedge (\forall J \supset I)(p[J, \alpha] \notin \Psi_{\ddot{a}\ddot{o}})) \quad ;$$

$$\Psi_{dp} = \bigcup_{l=1}^L \Psi_{dl} \subseteq P, \Psi_{og} \subseteq \Psi_{dp}, \quad \alpha = \overline{1, N}, \quad I = I(u), \quad u \in U, \quad (9)$$

besides the quantities Ψ_{dl} are agreed to rule ($\alpha = \overline{1, N}$):

$$(p[I, \alpha] \in \Psi_{\ddot{a}\ddot{o}}) \Rightarrow \Rightarrow (\forall J \subset I)(p[J, \alpha] \in \Psi_{\ddot{a}\ddot{o}})' \quad I = I(u), \quad u \in U \setminus U_L; \quad (10)$$

$$(p[I, \alpha] \notin \Psi_{\ddot{a}\ddot{o}}) \Rightarrow \Rightarrow (\forall J \supset I)(p[J, \alpha] \notin \Psi_{\ddot{a}\ddot{o}})' \quad I = I(u), \quad u \in U \setminus U_1. \quad (11)$$

The induction of discretionary global security policy means $\Psi_g = \Psi_{og}$, and the local security policy of discretionary means –

$$(\forall p = p[I, \alpha] \in P)((p \in \Psi_{\ddot{a}\ddot{o}}) \Leftrightarrow \Leftrightarrow (r[I, \alpha] = 1)) \quad (12)$$

During researches have been developed mathematical models of the synthesis of secure

communications policy interaction of the reference ADPS that can consider SP of some IP (at different structural components RMSAS-network) with the possibility of further interlinkages (a layered synthesis of SP on RMSAS network). As the basic structural components have been defined in a network interpretation (as part of RMSAS network) and systemic treatment (as appropriate system quantities) layers and concepts of superblock of RMSAS network. The layer $S_{l_H \dots l_E}$ of the level l_E with the lowest level l_H of RMSAS network $B_0 = S_{1 \dots L}$ is (in the network interpretation) part of RMSAS network related to the levels of RMSAS with numbers $l = \overline{l_H, l_E}$.

Superblock $S_{l_H \dots l_E}(I)$ of the level l_H with the index I (given superblock of RMSAS network $S_{l_H \dots l_E}$) of RMSAS network $B_0 = B_{1 \dots L}(0)$ is a part of layer $S_{l_H \dots l_E}$ with moduls index $J \subseteq I$. The ways setting various SP on individual structural components of RMSAS network, in particular, its layers and superblocks, by analogy with the task SP in all RMSAS network are identified.

For the account of the possibility of SP interlinkages given on the various structural components of RMSAS network, the concept of SP compatibility in two different senses is formally defined for all pairs of types of SP. Weak compatibility of random SP Ψ_1 and Ψ_2 , denoted as $\Psi_1 \sim \Psi_2$ is the lack of direct conflict between them. Strong compatibility of random SP Ψ_1 and Ψ_2 , denoted as $\Psi_1 \approx \Psi_2$ is the inability of a conflict between them, even in distributing of SP to all RMSAS network.

During the research is made a modeling of organizational and technological CA service management in case of IP protection of the typical SIP UA and in case of the reference ADPS. In both cases, for supporting the adoption of appropriate information security manager solutions it is proposed to use the new subsystem - the automated service management subsystem of information CA.

A set of criteria quality of service operation of CA as a control object has been substantiated:

- 1) dynamic – «adequacy of functioning» E_{af} ,
«temporary aggressiveness of functioning»
 E_{ta} ;
- 2) static (Boolean) – «functionality» E_f ,
«resource aggressiveness of functioning»
 E_{ra} , «functional aggressiveness of
functioning» E_{fa} , «usability» E_{yu} .

The mathematical models of evaluation criteria for the quality of service operation of CA are developed. Allowable value of static criteria means that it is monitored for integrity only that and even then, when it is provided by the operational documentation for ADPS.

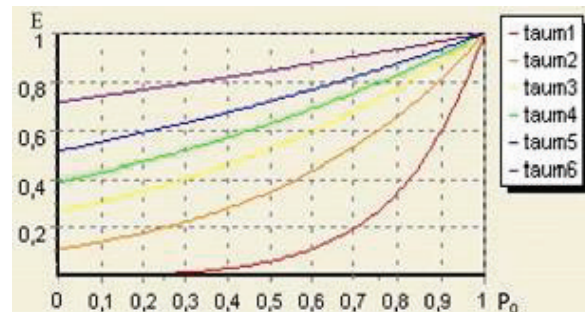
For the estimation of dynamic criteria semi-Markov model are proposed generated for normal ADPS based on the original E-network, and for the reference ADPS - original RMSAS network. These semi-Markov models make it possible to take into account the probabilistic nature of transitions between different states, and the arbitrariness of the laws of distribution of time of transitions at the assumption of independence probability and time transition from the previous transitions.

In the DELPHI programming environment we created a complex of problem-oriented software for modeling service management of CA of information processed as in conventional so in reference ADPS. It, in particular, allows us to construct graphic dependences of dynamic criteria, regardless of the variable parameters. Using these graphics choosing the optimal values of the controlled parameters and evaluate the attainable level of targets is visualized.

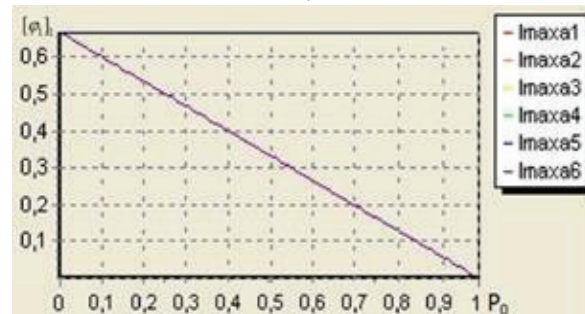
With the help of the developed software has been conducted a comprehensive research of the quality of the functioning of typical SIP as applied to the operation of workstations based on computers as part of ADPS and the criteria of efficiency and dynamic characteristics of the lifetime of the FSP (time of CA using discretionary access) in the reference ADPS (see Figure 1).

For the reference ADPS the results of calculations were presented in the form of dependencies of output variables from the single (unique for each method), regardless of the varied managed parameter by different

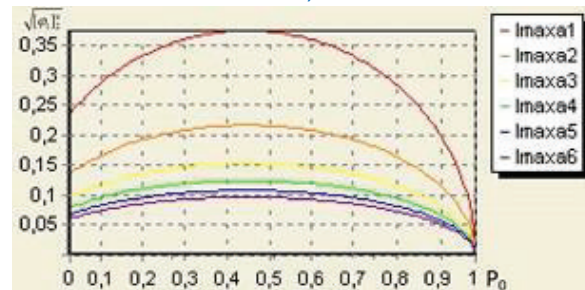
$\tau_m = 0,1;0,3;0,5;0,7;1;2$ (curves $taum_i$, $i = \overline{1,6}$)
and a different number of controlled levels
 $l_{max} = 1;3;6;9;12;15$ (curves $lmaxa_i$, $i = \overline{1,6}$).



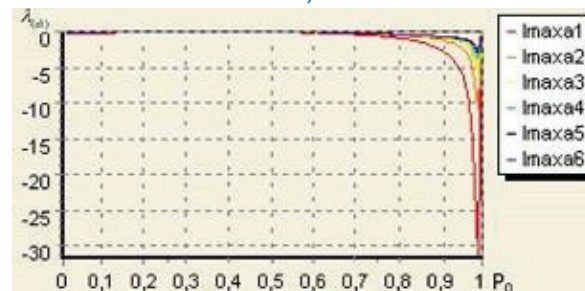
a)



b)



c)



d)

a – criteria of dynamic efficiency;
b – mathematical expectation;
c – standard deviation; d – Pearson ratio

Fig. 1 The results of the calculations for the reference ADPS

The output variables are the criteria E and the characteristics of the random variable duration of CA in discretionary access:

$[\varphi_1]_k, [\varphi_1]_k^H$ – initial and central moments of order $k = \overline{1,4}$; γ_a, γ_s – asymmetry coefficient and kurtosis; $A_{(di)}, a_{0(di)}, b_{0(di)}, b_{1(di)}, b_{2(di)}, D_{(di)}, \lambda_{(di)}$ – auxiliary and the first 4 parameters determinant of the quadratic trinomial and characterizing its relationship to the approximating Pearson distribution.

Analysis of the results of calculations, part of which is shown in Figure 1, allows you to identify patterns of governance. They do not contradict the known data and show the opportunities of modeling.

The procedures and the algorithms for optimal control of CA service separately for a typical SIP UA and the reference ADPS by estimated quality criteria for its operation, allowing us to find a compromise between ensuring the integrity and the efficiency of information processing are developed. To estimate the current values of the input variables in the evaluation criteria is intended the quality control subsystem of CA service operation. The calculations are performed by well-known formulas of mathematical statistics processing provided by recording and reporting subsystem of statistical data. According to the results of optimization of controlled parameters is generated a control action by throw-in sensor uniformly distributed on the interval $[0, 1]$ random numbers, making forecast difficult to the attacker. Thus, depending on the return sensor values, the values of the parameters of the next launch of the CA service are generated. For the reference ADPS they are determined like which part of controlled information will be checked for immutability, and in case of IP protection of typical SIP UA is only determined whether to launch service of CA or not.

The results of the application of models of invulnerable circulation of information technology to the standard database managed by the reference object-DBMS, evidence of wide abilities of these models to ensure the availability

and confidentiality of information processed in prospective ADPS CA.

4 CONCLUSIONS

Analysis of existing methods of HRIP modeling that affect the security of information conducted in this research has revealed the impossibility of ensuring for the level of models of invulnerability of processing technology and information transfer using flexible protective mechanisms, due to the lack of integration of mathematical models of the processing and protection of information.

A task-oriented graph-theoretic unit of RMSAS networks, allowing to model invulnerable processing and transmission of information with flexible protective mechanisms, providing a formalization and research of RMSAS SP is developed. It uses not only the details of the transfer process, but the data within the proposed hierarchical structuring of RMSAS resources for unified modeling of dynamic and static information access based on the integration of E-network and discretionary formalisms.

A method for modeling RMSAS networks regulated RMSAS SP for HRIP, allowing combining the flexibility of discretionary models with security of models of the final SP states is developed.

The mathematical models of synthesis of policy safe interaction of IP, allowing SP to consider separately the various structural components of RMSAS network with the ability to its further interlinkages have been developed. In particular, the mathematical models of SP in the reference DBMS. Considering as a promising SP DBMS object-relational DBMS, a method of aggregation of its models, providing compatibility with RMSAS are developed.

Using the apparatus RMSAS networks and E-nets new mathematical models of flexible reliability, availability, confidentiality and integrity of information processed, allowing mathematically describe the mechanisms to ensure the availability and confidentiality of the information and take into account the quantitative requirements for data integrity in the management of the service of CA are offered.

Mathematical models and algorithms of optimal control of the integrity of information processed, while maintaining the effectiveness of this treatment, allowing us to find a compromise between ensuring the integrity and the efficiency of information processing are developed. Exact analytical method for evaluating and analysis of

the complex criteria for assessing the quality service operation of CA of information uses semi-Markov matrix formalism, integrating matrix formalism of finite Markov chains and operator formalism of random processes in a single review of continuous-time and discrete states.

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THE BASIS OF MAKING THE STRATEGIC ALLIANCE BETWEEN COMPETITORS

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Summary:

The strategic alliances between competitors are principally known, but are researched insufficiently. There are no answers for such questions: if the competition emerges in the strategic alliance? If it emerges, how such alliance exists. There are answers for given questions in the article. Such answers are based on the results of experience analysis for known in the world business strategic alliances with partners, which are competitors. The answers are the following. It is shown, that the successful interaction between partners in strategic alliance of researched type is possible in the case of avoiding of direct competition. Competition in the strategic alliance between its participants emerges in the situation while they are the real competitors because of intersection of their interests on the same market. The successfulness of such alliance depends on fact, if the alliance participants are the real competitors or they are pseudo-competitors. If the competitor is real, there is no sense to make the alliance with him or it is necessary to be very careful. The basis of such alliance successfulness is the balance of partners' interaction. Such balance describes the situation when, at first, achieving the goals of partners' interaction is strategically important, at second, the volumes of interaction are the same for both partners. The pseudo-competitors are the economical agents, which make the production with the same purpose, but for different customers. Despite the production sameness the partners' interests about the production promotion on the market do not intersect (implicit, but significant differences in customers' needs and demands, that emerge because of natural (prices) or artificial (agreement about the market sectioning) way). There are high chances for the win of every participant in the strategic alliance with the pseudo-competitor. Such win is presented as the effect from partnership. The mutually beneficial co-work is possible between pseudo-competitors in alliance. Such co-work is the consequence of coincidence the alliance participants interests. The effect of partnership is presented as the win of every participant in competitive struggle with real competitors because of having the advantages from the participation in the alliance.

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strategic alliance, competitiveness, competitor, pseudo-competitor, effect, balance of interaction



1. INTRODUCTION

Strategic alliances have got the wide distribution in international practice; it's a promising form of cooperation between enterprises in different industries. Strategic alliances, in S. Griffith's article: "Focus swings to Joint Ventures as economic outlook weakens" (Griffith, 2008) (Kozachenko & Shul'zhenko, 2012), are easier to be organized, participating companies do not lose their independence, and an alliance allows "surviving" in not-good times in the world, the national economy or of individual enterprise.

In modern scientific literature benefits of strategic alliances are considered in detail sufficiently. About threats that are involved in strategic alliance, we know much less. However, their presence does not mean rejection of this organizational form of enterprises cooperation, but only the need to consider them at the stage of decision making on joining it.

Typology of strategic alliances is quite diverse. Among them alliances with competitors attract the attention with their contradictions (Garrett & Dussauge, 2002, pp. 79-91). Such alliances are mentioned by many followers after B. Garrett and P. Dussauge. This type of strategic alliances is selected by the criterion "the existence of a competitive relationship between the alliance participants.". But is it really possible to have a strategic alliance with competitors? Is there competition in strategic alliance? And if so, how then does this alliance exist? How can every participant of this strategic alliance with competitors get the benefits, which are promised in the alliance?

Answers to questions about strategic alliances may be useful in decision making about participating in strategic alliance, that somehow have to be accepted in the near future by domestic producers, which activity under the influence of external forces (increasing competition, its globalization, increased innovation processes) and internal environment (availability of resources, capabilities and competencies in companies and business groups which they due to certain circumstances cannot dispose fully effective) is slowly but steadily changing.

The research, which was held in order to provide answers to those questions, was conducted

using the results of analysis experience of the world-known strategic alliances, the partners of which are competitors. The authors refer to features of competitive relationship between partners in strategic alliance Renault-Nissan in this article. This strategic alliance between competitors is almost "specular" because both companies are members of the automotive industry, specializing in the production of passenger cars and commercial vehicles, and that production of partners competes. In addition, the market for car companies Renault and Nissan is international – production of partner companies on the market is presented in more than 100 countries and most of the markets is shared by partner companies (Strategyčeský al'jans Renault-Nissan, 2013).

Based on the given lack of knowledge in modern domestic scientific literature about the creation and building successful relationship between partners - competitors in strategic alliance, it can be considered that delineated subject field of research is interesting from scientific and practical point of view.

2. ANALYSIS OF CONDITIONS OF STRATEGIC ALLIANCE BETWEEN COMPETITORS

Persistence and long-term of common cooperation between partners in the strategic alliance depends on those key foundations that are laid while creating the strategic alliance, on which building further relationships between partners is based on. It is important and relevant to analyze these bases, which allow building a solid foundation for making relationship between companies – competitors in the alliance and ensuring successful and effective partnerships.

Competition in the strategic alliance between participants arises only when they are real competitors, who they produce similar product or (service), which is presented on the same market. The reality of competitive relations in the strategic alliance is caused not only by similarity of products with its ability to satisfy certain customer needs, but the size of competitors, sales volumes and a part of a particular market. Therefore, the success of a strategic alliance formed by competitors depends on whether the members of the alliance are real competitors or not. Competition occurs between approximately

equal with respect to these features producers due to crossing their interests in the same market. In the conditions of pseudo-competition the interests of members of strategic alliance, which at first glance are the same, do not actually intersect. Fake competitors should be considered as economic agents that produce the same production for different customers, but if the product is similar, their interests over its promotion in the market do not cross because of implied, but significant differences in consumer demands which arise because of natural (prices) or artificial (market sharing agreement) reasons. Products of these manufactures, same intended, satisfy different preferences of consumers for such products. That means that the businesses are in different market segments, which are organized by consumer benefits.

If a competitor is real, then it does not make sense to form a strategic alliance with him, or someone needs to be very careful clearly and should define areas of cooperation (individual development or artificial market sharing as cartel). It's unreasonable to expect the benefits for all participants from such strategic alliances, especially in the long run. In such strategic alliances all participants cannot simultaneously win. It must be loser. Well, if the loss can be compensated somehow (for example, by a significant gain in another aspect).

It makes sense to form the alliance with fake competitor. In this strategic alliance there is quite a good chance of winning for every participant, which is based on the effect of partnership. Effect of partnership for participants of strategic alliance with fake competitors occurs in scoring every of them in competition with real competitors as a result of receiving benefits which every side of strategic alliance receives with fake competitors. These benefits may be technology, investments, development, entering new markets with products that are not competitors products of participants products of strategic alliance with fake competitors. The overall effect of each participant from partnership in strategic alliance with fake competitors consists of the benefits obtained from accomplices' in the alliance and in competition with real competitors.

Strategic alliance, whose members are fake competitors, is the alliance of synergy. Synergism of strategic alliance in this case arises from

mutual cooperation of partners in research and experiential development work, production and promotion of products. After all, between fake competitors in a strategic alliance it is possible the mutually beneficial cooperation. Such cooperation is the result of interests coincidence for the alliance participants. Synergism of partnership in strategic alliances with competitors is ensured not only by partners expenses reducing of, but also by increasing their incomes as a result of the interaction in the area of advanced technologies innovative technologies that help to environmental protection, when entering new markets, strengthening presence on international markets, upgrading and expansion of model range, strengthening and enhancing brand image.

3. RENAULT – NISSAN STRATEGIC ALLIANCE ANALYSIS

An example of synergy alliance is the strategic alliance Renault – Nissan. Synergism of alliance is based on the partners' mutual cooperation in car making on common platforms and shared power equipment (Renault Rossija, 2011). Shared platforms and nodes, standardization of logistics operations (massive joint structure of procurement in alliance - a joint venture RNPO (Renault-Nissan Purchasing Organization) (Drom.ru, 2009) allow partners to reduce production costs, ensure smooth operation of companies and better quality after-sales service, streamline internal processes, reduce costs, reduce delivery time of spare parts (Anon, Strategyčeskij al'jans Renault-Nissan, 2013). Companies of strategic alliance annually have more than 200 million euro savings based on logistics synergies through joint ownership of warehouses, containers, ships, etc. (AllianceRN, 2012).

So in the strategic alliance Renault-Nissan both companies invest in building manufacturing factories of new molded-ion batteries needed for the production of electric cars by Nissan - in Portugal with a total capacity of 50 thousand units of batteries per year and in the UK, with an annual capacity of 60 thousand units; company Renault - France with a total production capacity of 100 thousand units per year (Anon, Nissan begins construction of Portugese battery plant, 2011).

Within the development of technologies of zero-emission engines which are developed by alliance based on the experience of both partners it is possible to split costs and reduce investment in the development of up to 230 million (Renault Rossija, 2011). Based on the above, it can be concluded that the strategic alliance partners within the usage of innovative technologies try to equilibrium participation both in terms of investment and separation production capacity and the expertise partners.

Providing the synergetic effect from partnership in strategic alliance is possible and by expanding the product line of partner companies based on mutual adaptation practice and by sale of partner's products under own trade mark (double-bagging) (Grachev, Yurkov, & Bolshakov, 1999). After all, in the alliance each partner has the opportunity to use the production capacities of other participants that allows obtaining additional income from partners' production in the markets of different countries. Using the practice of double – bagging allows to sell products of one partner's trade mark under the trade mark of another in those countries where the brand of first one is unknown or little known and another trade-mark is popular and in demand.

The balance of interaction of partners is basis of the success of a strategic alliance with competitors. Such balance occurs in case of, firstly, every partner achieves goals, that require cooperation, and secondly, the amounts of interactions are equal. Common strategic directions of partnership in alliance are given in table 1 as an example of Renault-Nissan strategic alliance.

Strengthening presence in international markets involves the development of new markets that are paid close attention by large manufacturers now, including those, that participate in various strategic alliances. Experts believe that the next few years the value of emerging markets in Brazil, India, China and Russia will increase. Considering development of markets, significant growth potential, powerful producers strive to expand their presence on them. Placement of manufacturing facilities on the territories of such countries will allow reducing the cost of products for consumers by localization of production, thus increase sales. Markets of those countries form

an interest for producers and consumer goods, and complicated equipment, including cars. Part of these countries, according to experts, on the global car market will grow from 24% in 2008 to 40% in 2025. (Anon, Strany s razvyvajushchejsja èkonomykoj reshly zavoevat' avtorynok, 2012).

Equilibrium cooperation of partners – fake competitors of strategic alliance on development of perspective markets involves implementation of joint investment projects in each of the countries with developing economies. Participants investments of such alliance into development of emerging markets, and strengthening positions in existing markets should be equal in nature. Participants of a strategic alliance have to realize various investment projects in one market or one country or invest joint investment in a facility that provides the ability of further sharing by partners. Companies Renault and Nissan are the example of the equilibrium interaction of partners in strategic priorities realization (Table 2) (Renault.kz, 2011) (Renault.br, 2012), (Renault.in, 2013), (Renault, 2011), (Renault.ru, 2013), (Renault, 2011).

Balance of interaction between partners in a strategic alliance assumes equilibrium participation of partners in the development of strategically important activities in terms of usage not only investment, but also intangible assets, using the experience of partners, equal distribution of capacity between partners on the markets of separate countries, including countries with developing economies.

Successful interaction of partners in a considering type of strategic alliance, in our opinion, is possible when partners can avoid direct competition. Therefore it's appropriate to find out the features of competition between the partners on common markets. Partners' lineup has to be balanced in such way so that partners will not be in direct competition in the markets of countries where all members of a strategic alliance have a strong position. Each participant must submit products belonging to different classes. If still the same separate products belong to the same class, the corresponding products of partner companies have to be positioned in different price segments or offered products should be different by characteristics.

Table 1. Comparative strategic goals of Renault and Nissan companies

Renault company	Nissan company
Using innovations that are required in order to match the energy and environmental needs of the planet	Careful attitude towards the environment, including by offering models with zero emissions of harmful substances Creating technologies with decrease emissions
Providing enhanced product plan	Output to market new models of Nissan (every 6 weeks) (Nissan, 2012) Creating a global model range which will include 66 models and will be presented in 92% of all world markets and all existing segments The development of luxury brand Infinity to 10 models presented in more than 70 countries
Strengthening the brand	Strengthening brand image
Saving position in Europe and renewed growth in the international market	Increasing market share in China up to 10% Strengthening the company's presence in Brazil, Russia, India and other growing markets (Nissan)

Source: the results of author's comparative analysis using (Nissan.br, 2013), (Nissan.in, 2013), (Nissan.cn, 2013), (Renault.kz, 2011), (Renault.br, 2012), (Renault.cn, 2013), (Renault.in, 2013), (Renault.ru, 2013).

Table 2. Directions of equilibrium interaction between companies Renault and Nissan on implementation of strategic priorities

Strategic Priorities of partnership	Directions of equilibrium partners interaction
Using innovative technologies that protect the environment	Uniform investments in construction of plants with the production of molded-ion batteries that provides approximately the same amount of investment and the uniform distribution of productive capacities Costs distribution and use the experience of both partners in the development of engines with zero emissions
Strengthening presence in international markets	Equal investment in construction of new or developing existing companies in one country Joint investments into the construction of new plants
Updating and expanding lineup	Development of new car models on the basis of common platforms Sharing experience in technology of manufacturing Mutual practice of adaptation and sales partner production under its own brand
Strengthening and enhancing brand image	Complementation consumer perceptions about the brand of one of the partners perceptions about the other brand Power of the two brands, which makes part of the alliance, can enhance the image of each brand

Source: the results of author's analysis using (Renault, 2011), (Renault.kz, 2011), (Renault.br, 2012), (Renault.cn, 2013), (Renault.in, 2013), (Renault.ru, 2013)

In the markets of countries where the positions of the strategic alliance are weak, it is necessary to maintain a balanced range of partners' products.

Under such circumstances members of the strategic alliance compete with each other in no way and have to try to become stronger in this market.

An important condition for long-term partners' cooperation in the strategic alliance is to provide the growth of every partner. Partners' cooperation in the strategic alliance has to promote not only to their growth, but also enhance the competitive position of partners in the market, which is essential for effective participation in the alliance. At the same time strengthening the competitive position of each alliance participant has to be achieved by external competitors, not allies.

CONCLUSIONS

Thus, the study allowed building the basics of creating the strategic alliance with competitors.

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MONTE CARLO SIMULATION IN INTRALOGISTICS

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Abstract

One of the tasks of the intralogistics services is to help the development of the production process timely, i.e. to provide the continuity of production. This requires, among other things, the harmonization of production rhythms and the transporting-manipulative equipments' work cycles. In them, the process of transport runs and is organized so the material is delivered to work positions two to four hours before the processing starts, and taken away two to eight hours after the processing has been finished. This analysis has multiple aims. First, we should determine which number of transporting equipments would minimize the total costs. Further, when making this decision, we don't want to experiment in reality but on the model, in advance, before engaging ourselves in investments, i.e. before the transport has been realised and the technology and the organization of the working system engaged. In that respect, our aim is to shape and analyze more and less expensive variants of the solution with relatively short realization deadlines. Finally, we need a procedure which will be accessible and useful to the project engineers of the technological and transporting processes in intralogistics.

Key words: intralogistics, simulation, modelling, algorithm, work cost, variant

1 INTRODUCTION AND PROBLEM DEFINING

One of the main tasks of the intralogistics services is to support development of the production process, i.e. to provide continuity of production, (Davidović, 2012) which requires, also, the harmonization of production rhythms and

the transporting-manipulative equipments' work cycles. The examined problem will be simplified by the experimental fact that there exist variations in the daily extent of output, and, consequently, in the daily volume of the transport tasks which have been realized. If we determine the quantity of the means of transport on the basis of maximum needs, according to the maximum daily production (which is recorded very few times during the year), in this case the car fleet will expose us to relatively high investment and maintenance costs. Besides,

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during most of the year we won't be able to use the available transport capacities completely. On the other hand, if we take a smaller number of equipments than the one corresponding the transport tasks with the maximum daily production, the loss of the transport capacity, which needs be compensated by overtime work, will occasionally appear. However, less equipments mean smaller investment and maintenance costs. So, we can see that the number of equipments implies two types of reverse trends. More equipments mean the rise of investment and maintenance costs, but the decline of the extra work costs.

Less equipments bring the reduction of the investment and maintenance costs, but the increase of the overtime work costs.

2 CONCEPTION AND METHODS FOR THE PROBLEM SETTLEMENT

The problem considered can be solved by Monte Carlo numerical simulation [(Fishman, 1999), (Kun, 1973), (Vukadinović & Popović, 1996)]. Therefore, it is necessary to collect the parameters needed for setting the simulation model. As first, it is necessary to establish the distribution of frequency according to the daily material demand (kg, pcs, m³...), to be transported, by using the variations of the daily volume of production. Then, the distribution of frequency of the daily material delivery per one means should be established. We also need the information about the amortization, maintenance and exploitation of means. Further on, the personal incomes of transport workers as well as the overtime work expenses should be determined. Other data, which also influence the problem considered, can be introduced. The problem was considered in a metal processing factory which had the arranged data about the daily scope of production and about the movement of the daily demand and material delivery from the previous period.

These data will be used in all the future analyses and they will be completed by the supposition that the production situation is stable. In other words, it is necessary for the developments in the plant to be realized according to the probability laws which were valid in the previous period. In

that respect, the company analysts placed the following data at our disposal:

The distribution of frequency the daily demand follows the law of normal distribution, with:

- the average value of: $U_s = 300$ loads/day;
- the standard deviation of: $\sigma_1 = 20$ loads/day.

The distribution of frequency of the daily delivery of load also follows the normal distribution, but with:

- the average value of: $\nu = 40$ loads/day;
- the standard deviation of: $\sigma_2 = 4$ loads/day.

All costs of the transport facilities exploitation, including the personal incomes are:

$$t = 200 \text{ monet.units/day/per vehicle.}$$

All the costs of the equipments exploitation during the overtime work, including personal incomes, are:

$$D = 30 \text{ monet.units/hour/per vehicle.}$$

By using the previous data, we can start solving the problem. The basic conception is that the daily demand, as well as the daily delivery of load and the mass operating phenomena, each in its own way, depend on the multitude of factors and their interactions, that is, both phenomena depend on luck. According to that, this phenomenon can be considered through the law of probability, that is, through the mathematical statistics.

3 THE DEVELOPMENT OF THE SIMULATION MODEL

We start the analysis by considering the distribution of frequency of the daily quantity of material, that is, of the average value and the standard deviation of that distribution. But, instead of observing the movement of that demand, i.e. the movement depending on luck, in reality from day to day, those cases will be simulated here, as presented in the following tables. We perform the simulation by connecting each development, in this case the daily demand of material, with a random number. In other words, if these plant occurrences appear 'accidentally', that can happen in the same way that some numbers appear randomly. They can be generated by computer [(Letić, Davidović,

Berković, & Petrov, 2007), (Pidd, 1998), (Radenković, Stanojević, & Marković, 1999)]. For this type of simulation we need random numbers with average value $U_s = 300$ and:

- the total deviation of daily demand of:
 $6 \cdot \sigma_1 = 120$
- the average value of $v = 60$ and the total deviation with the daily delivery: $6 \cdot \sigma_2 = 24$

We need this type of random numbers because we can find the standard deviations σ_1 and σ_2 of the statistical sets among the initial data, supposing that the total deviation, as the maximum deviation spread, equals *six sigma*.

3.1 Simulation of demand of the daily quantity of load

We perform the demand simulation of the daily quantity of load for one working week, considering that it consists of five working days T-1. The simulation algorithm is so shaped that from the average value of demand, i.e. from $U_s = 300$, we subtract or we add the value of accidental deviation to that value.

Table 1 The simulation of the daily quantity of load during one working week (T-1)

U_a
288.115
271.8
341.813
308.98

The random number 3-rnd (6) can have the highest value of +3, the smallest -3, and it is uniformly distributed.

The simulation model can be presented as:

$$a := 1 \dots 5 \quad U_a := U_s + \sigma_1 \cdot (3 - \text{rnd}(6))$$

3.2 Simulation of delivery of the daily quantity of load

The simulation of the daily transported material quantity during one working week is presented in the tables (T-2/8). We can perform the simulation in many variants, i.e. for the case of one, two or more means. Therefore, the number of means (n) is the parameter that can be changed, e.g. as: $n = 1.6$

The algorithm and the simulation flow are similar to the previous one: $V_a = v + \sigma_1 \cdot (3 - \text{rnd}(6))$.

Let's generate one series of random numbers 3-rnd(6), one number for each working day. This series of numbers should differ from the adequate series at daily demand, because the daily transported material quantities are distributed differently. However, the series of five random numbers should be kept in all variants of the transport simulation, so they could be compared mutually.

Table 2 The simulation of the daily transported material quantity during one working week

V_a	$2V_a$	$3V_a$	$4V_a$	$5V_a$	$6V_a$
68.010	136.020	204.030	272.040	340.050	408.060
61.181	122.362	183.543	244.724	305.905	367.086
70.631	141.262	211.893	282.524	353.155	423.786
53.200	106.400	159.600	212.800	266.000	319.200
59.523	119.046	178.569	238.092	297.615	357.138

We keep these five random numbers in all variants - for the variant of work simulation with one vehicle, two equipments, three equipments, etc. up to the sixth vehicle.

Table 3 The variant of work simulation with one vehicle

U_a	V_a	$U_a - V_a$
288.115	67.296	220.819
271.800	51.854	219.946
291.312	59.978	231.334
341.813	71.340	270.473
308.980	58.258	250.722

Table 4 The variant of work simulation with two equipments

U_a	$2V_a$	$U_a - 2V_a$
288.115	134.592	153.523
271.800	103.708	168.092
291.312	119.956	171.356
341.813	142.680	199.133
308.980	116.516	192.464

Table 5 The variant of work simulation with tree equipments

U_a	$3V_a$	$U_a - 3V_a$
288.115	201.888	86.227
271.800	155.562	116.238
291.312	179.934	111.378
341.813	214.02	127.793
308.980	174.774	134.206

Table 6 The variant of work simulation with four equipments

U_a	$4V_a$	$U_a - 4V_a$
288.115	269.184	18.931
271.800	207.416	64.384
291.312	239.912	51.400
341.813	285.360	56.453
308.980	233.032	75.948

Table 7 The variant of work simulation with five equipments

U_a	$5V_a$	$U_a - 5V_a$
288.115	336.480	-48.365
271.800	259.270	12.530
291.312	299.890	-8.578
341.813	356.700	-14.887
308.980	291.290	17.690

Table 8 The variant of work simulation with six equipments

U_a	$6V_a$	$U_a - 6V_a$
288.115	403.776	-115.661
271.800	311.124	-39.324
291.312	359.868	-68.556
341.813	428.040	-86.227
308.980	349.548	-40.568

3.3 The simulation of the overtime work costs

In the next phase, we perform the simulation of the overtime work costs, as shown in the next tables. Those costs were presented depending on the number of the assets employed, i.e. the **earmarked assets**. In the columns of these tables there are the data of the daily demand of material which were established in the table T(9/14) by simulating. The values of the daily demand of material, as a series of numbers, remain unchanged for all variants, i.e. regardless of the number of means. The difference between the daily demand and the daily delivery of material presents the number of materials which should be transported by the extra work. It is presented in the tables $U_a - n \cdot V_a$. As we know that during one overtime hour one vehicle can deliver, on the average, eight materials/hour (which is derived from: $60 / \text{materials/shift/vehicle} / 7,5 \text{ hour/shift} = 8 \text{ materials/hour/vehicle}$), the necessary number of the extra work times is calculated by dividing the value of the column G_a with eight, or by its multiplying by 0,125, which has actually been done in the paper. We calculated the overtime work costs for every day by multiplying the extra work hours with the values gained from the analysts in advance, i.e. with $D=50 \text{ monet.units/hour}$. These costs are shown in the following tables.

For every working week the daily costs of the extra work are added, and they are presented in the last column. The simulation has been performed for all six variants (Table 9 - Table 15), along with the application of the programme instruction if, so that we can dissociate ourselves from the negative value of the costs.

Table 9 The model

$$G1_a := U_a - 1 \cdot V_a \quad G1_a := \text{if}(U_a - 1 \cdot V_a < 0, 0, G1_a) \quad (1)$$

$$G2_a := U_a - 2 \cdot V_a \quad G2_a := \text{if}(U_a - 2 \cdot V_a < 0, 0, G2_a) \quad (2)$$

$$G3_a := U_a - 3 \cdot V_a \quad G3_a := \text{if}(U_a - 3 \cdot V_a < 0, 0, G3_a) \quad (3)$$

$$G4_a := U_a - 4 \cdot V_a \quad G4_a := \text{if}(U_a - 4 \cdot V_a < 0, 0, G4_a) \quad (4)$$

$$G5_a := U_a - 5 \cdot V_a \quad G5_a := \text{if}(U_a - 5 \cdot V_a < 0, 0, G5_a) \quad (5)$$

$$G6_a := U_a - 6 \cdot V_a \quad G6_a := \text{if}(U_a - 6 \cdot V_a < 0, 0, G6_a) \quad (6)$$

Table 10 The simulation - variant 1

G1 _a	0.125·G1 _a	D·0.125·G1 _a
220.819	27.602	828.071
219.946	27.493	824.798
231.334	28.917	867.503
270.473	33.809	1014.274
250.722	31.340	940.208

$$k_1 = \sum_a D \cdot 0,125 \cdot G1_a$$

Table 13 The simulation - vaiant 4

G4a	0.125G4a	D*0.125G4a
18.932	2.367	70.995
64.385	8.048	241.444
51.4	6.425	192.750
56.453	7.057	211.699
75.947	9.493	284.801

$$k_4 = \sum_a D \cdot 0,125 \cdot G4_a$$

Table 11 The simulation - variant 2

G2 _a	0.125·G2 _a	D·0.125·G2 _a
153.523	19.190	575.711
168.092	21.012	630.345
171.356	21.420	642.585
199.133	24.892	746.749
192.464	24.058	721.740

$$k_2 = \sum_a D \cdot 0,125 \cdot G2_a$$

Table 13 The simulation - vaiant 5

G5a	0.125·G5a	D·0.125·G4a
0.00	0.00	0.00
12.53	1.57	46.99
0.00	0.00	0.00
0.00	0.00	0.00
17.69	2.21	66.33

$$k_5 = \sum_a D \cdot 0,125 \cdot G5_a$$

Table 12 The simulation - vaiant 3

G3a	0.125·G3a	D·0.125·G3a
86.228	10.7785	323.355
116.238	14.52975	435.8925
111.378	13.92225	417.6675
127.793	15.974125	479.22375
134.205	16.775625	503.26875

$$k_3 = \sum_a D \cdot 0,125 \cdot G3_a$$

Table 15 The simulation - variant 6

G6a	0.125·G6a	D·0.125·G6a
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0

$$k_6 = \sum_a D \cdot 0,125 \cdot G6_a \quad (12)$$

3.4 Calculation of the total transport expenses

The total expenses are presented as all the others, depending on the same parameter, i.e. the number of equipments. By total expenses we mean the expenses of the regular working time and the extra work costs. From the basis of the problem solving, it has already been indicated that the exploitation expenses in the regular working time for every vehicle are $t = 200$ monet.units/day. Accordingly, the exploitation expenses in the regular working time, during one working week, can be calculated using the next formula:

$$t := 200; \quad d := 5 \quad \Delta_n := d \cdot t \cdot n \quad (13)$$

By adding up these expenses, we get the total transport costs during one week, depending on the number of means. Those values are presented in the last table T-15.

Table 15 Simulation of the cost

n	Δn	kn	Σn
1	$1 \cdot 10^3$	$4.475 \cdot 10^3$	$5.560 \cdot 10^3$
2	$2 \cdot 10^3$	$3.317 \cdot 10^3$	$5.428 \cdot 10^3$
3	$3 \cdot 10^3$	$2.159 \cdot 10^3$	$5.207 \cdot 10^3$
4	$4 \cdot 10^3$	$1.002 \cdot 10^3$	$5.032 \cdot 10^3$
5	$5 \cdot 10^3$	113.324	$5.311 \cdot 10^3$
6	$6 \cdot 10^3$	0	$6.027 \cdot 10^3$

The least, i.e. the minimum value of functions of the simulated expenses in this case is:

$$\min(\Sigma) = 5001.69 \text{ monet.units.}$$

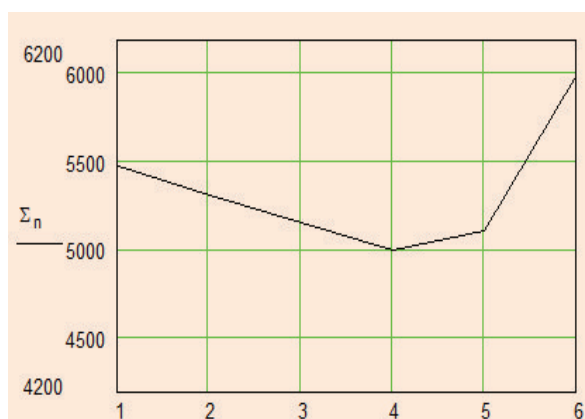


Figure 1 Diagram of the total transport costs

The data in this table show that in most cases the total transport expenses are the smallest in the

variant when four means are engaged. The decision maker can even decide to use five means, so that he could have the reserve in the case of defect of some means or to avoid the extra work expenses, because they are, as it can be seen in the table (T-15), equal to zero, in the case when the work is done for six means. In this way we finished the simulation process as a computer experiment representing the scenario of the future transport situation. Besides in the tables, the results can also be shown graphically, as in the figure 1.

4 CONCLUSION

The simulation method presented by using the Monte Carlo technique proved itself as easy applicable on the chosen type of the transport problem. By using it we have experimented, i.e. considered many variants of the possible solutions, indirectly, on the model, not in reality, and thus greatly reduced the costs. During the consideration, the evidence of the events from the previous period was used, without alterations, because it was supposed that the situation in the plants was stable. However, some other options with different assumptions and limitations could have been set. The available information was general and subject to a specific form of distribution. It should be mentioned here that problems like the previous one can be considered on the basis of empirical data which don't have to be generalized and reduced to a mathematically-statistical form since the Monte Carlo method allows it. The reliability of the simulation depends on the size, i.e. the dimensions of the replications. In the presented example the sample, although processed by computer, is very small and it wouldn't satisfy the demands of practice. The simulation could have been performed with more realizations, by simulating the demand and delivery during several months or years. Big samples could be processed by computer, using the random numbers vector and in more options. However, the goal of it was to enable better understanding of the studied process. We mustn't neglect the fact that simulation cannot provide the optimal solution as applying some of the mathematical methods can. We can consider this solution conditionally optimal. In fact, the solution which is not equal $n = 4$ of transport means can appear in

some replications. By the frame method, which can be applied in Mathcad (Letić, Berković, Davidović, & Petrov, 2007), such case would be observed. But, the solution where $n = 4$ is dominant in most cases. Anyway, the simulation enables analyzing the problems, developing the

options and their comparison, but the work of defining the problems, setting the options themselves, their evaluation and decision making regards the selection of the optimal option should be done by an analyst – technologist.

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ONE METHOD OF ANALYSIS OF RESEARCH PUBLICATIONS' ELEMENTS

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Summary:

In this paper the method of research publications elements analysis that determines common qualities of research publications and their clustering as an instrument of selecting and sorting out the information about research scholars has been introduced. There is described the method, which analyses the document. The document consists of it's name, keywords, author, main part, and literature. Defining elements of the document is based on the allocation of such text features as: location in the document; location of a paragraph; type of writing; character recognition. The sum of the individual weights of words and sentences tend to be determined after further modification according to specific settings associated with each weight, gives the total weight of the sentence. The algorithm to create a database publishing features is presented. The architecture of scientific scholars forming system is described, as well as the purpose of the database relations. The database is implemented in SQL Server 2005. The business-part of the analyzer for data retrieval and for data finding is described.

Keywords:

research school, clustering, k-means, parsing, decision support system, system architecture, relational database

1. INTRODUCTION

The Research School (the Research Area) is the policy and operational unit supporting research across the whole institution. It embraces five interlinked units. The Research Grants and Contracts team provides expertise and support

for the development and submission of research grants and contracts. The Innovation and Enterprise team supports the growing research and enterprise portfolio and manages intellectual property.

The Research Careers Development team is responsible for providing the framework to support researchers at all stages of their career and provides structured support in collaboration with specialist faculty and HR offerings. The

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Research Degrees team is the main point of contact for postgraduate research students and their supervisors. The Research Strategy, Information and Governance team develops, implements and monitors the institutional research strategy. It also has responsibility for research governance, policy, management and reporting of research-related management information, and development and dissemination of institutional research publications and other communications.

The remit includes management of institutional submissions to research assessment exercises (e.g. RAE 2008, REF 2014), statutory returns, coordination of research and enterprise-related consultations and management of institutional strategic research investment.

Abstracting is the process of obtaining information of primary importance from one or several sources in order to create a shorter version of it to meet the requirements of some users or tasks (Brandow, Mitze, & Rau, 1995) (Solton, 1979).

Among the segmental items of scientific publications the following ones can be defined: the author, the research institution, the subject, the keywords. It is determining of these 4 elements that gives the possibility of faster content searching as well as text and structured information integrating.

The process of abstracting is divided into three phases: analysis of the source text, identify specific fragments and the formation of appropriate conclusion. Most current work focused around technology developed referencing one document (Brandow, Mitze, & Rau, 1995).

The method involves compiling quotes emphasis on the selection of characteristic fragments (usually sentences). This method of mapping

phrase patterns allocated blocks biggest lexical and statistical relevance. Creating a final document in this case is merging aggregation of selected fragments.

Most methods used linear model weights. The basis of the analytical phase of this model is the procedure for appointing weights for each block of text according to characteristics such as the location of the block in the original frequency of appearance in the text, the frequency of use of key sentences, as well as indicators of statistical significance. The sum of individual weights are usually determined after further modifications according to specific configuration parameters associated with each weight, gives the total weight of the entire block of text (Solton, 1979).

2. THE METHOD OF RESEARCH SCHOLAR CLUSTERING

Uploading the data, analysis and selection of the publications elements are the necessary steps to acquire information needed from the content for its further processing. Suppose there is a certain publication P. We will analyse the document, which consists of name T, keywords K, author A, main part M, literature L (Shakhovska & Stakhiv, 2012):

$$D = \{T, K, A, M, L\}$$

Defining elements of the document is based on the allocation of such features text:

- location in the document;
- location of a paragraph (left, right, centered);
- type of writing (bold, italic, underline, normal);
- character recognition.

Based on these characteristics formed the basis of the rules of recognition elements of the document (Table 1).

Table 1. The recognition elements of the document parsing

id	type	place	paragraph	alpha	symbols
1	title	BEGIN	{Center;Right}	{Bold}	
2	author	BEGIN	{Center; Left}		{By;©: (C) }
3	keyword	BEGIN			{Keyword;}
4	main	CENTER			
5	literature	END		{Typical, Italic}	

To form essay there is stand out from the main part of the sentence.

Bulk, in turn, is divided into fragments by divisions and sections, introduced by the authors. It is believed that the sentences that appear in

the introduction and conclusion, with higher informative value than a sentence with the middle of text.

First of all, we introduce the concept of weight sentence.

The coefficient is defined as the location

$$Location = \frac{1}{n \cdot m},$$

where $n = \overline{1..3}$, $m = \overline{1..3}$ are the places calls to the main part and paragraph respectively. Begin and end of text or paragraph estimated value of 1, the middle is as 3. Coefficient key phrase is determined by entering the sentence U of elements of a set of significant sentences from A membership function:

$$Cuephrase = \mu_A(U),$$

$A = \{\text{"In the end", "However" ...}\}.$

Index of statistical significance is formed on the basis of visiting sentence keywords specified by the author of the article:

$$Statterm = \mu_K(U).$$

The value added is defined as the presence of terms related words sentences that appear in the article's headline to the total number of words in a sentence (words) except for words whose length is less than three characters:

$$Addterm = \frac{word}{words}.$$

So after being allowed to study all the documents necessary to accomplish the following: to exclude a statement that its content has hit the

consolidated data repository and perform the final sorting sentences. For the task of bringing to the final ranking factor "information novelty" use the following method:

Let we have two sets of sentences $B = \emptyset$ and $A = \{A_i | i = 1, 2, \dots, N\}$, N is count of sentences in text. For every sentence A_i the usefulness

$P(i)_i$ set $q_i: P(i)_i = q_i, i = 1, 2, \dots, N$.

The sentences from set A sort Descending $P(i)_i$.

If A_i has the biggest $P(i)_i$, we take it in B. The usefulness for sentences in A set s $P(i) = P(i) / kq_i$, where $k > 0$ – factor clipping similar sentences.

Is A empty? If NOT, go to 1.

After publication abstracting the expected material's "characteristics" have been obtained.

This characteristics have been analyzed and the necessary information has been received the research publication clustering can operate.

Clustering is the automatic partition of the elements of a certain set into groups. It can be achieved by using the k-nearest neighbor algorithm. The k-nearest neighbor algorithm consists of several steps.

Step 1 – Setting up the number of neighbors - k. Since the features of clustering (author, research institution, subject, keywords) have not been arranged properly the d-isolated points matrix is to be applied:

$$l(X.x, Y.x) = \begin{cases} 1, X.x = Y.x \\ 0, X.x \neq Y.x \end{cases}$$

$$d(X, X_i) = \sum_i^p l(X.A_i, Y.A_i) + \sum_j^r l(X.D_j, Y.D_j) + \sum_t^w l(X.B_t, Y.B_t) + l(X.C, Y.C)$$

where:

p – number of authors of both of the publications,

r – total number of keywords,

w – total number of scientific institutions,

$X.A_i$ - the author with number i for scientific publication X etc.

Step 2 – Determining the k - nearest neighbors for every object.

Object X_i is considered to be the nearest neighbor for X if $d(X_i, X) = \max_i d(X_i, X)$,

$i = \overline{1, N}$, where N is the number of publications.

Step 3 – Object X is defined to be of the same type as most of his nearest k neighbors.

If the object is not registered in any of the clusters loose bounds between the object and the clusters are being searched for. If the value of distance between the objects X and X_i is smaller than one third of its maximum number they are loosely bound:

$$d_s(X, X_i) \leq \frac{\max d(X, X_i)}{3}.$$

Let us demonstrate how scientific school is the forming.

We have publications P1 and P2. First highlight information about the author, academic institutions, keyword and subject.

We will set P1 and P2 with certain characteristics:

$$P1 = \begin{cases} A = a11, a12 \\ B = b1 \\ C = c1 \\ D = d11, d12, d13 \end{cases} \quad \text{and} \quad P2 = \begin{cases} A = a21, a22 \\ B = b2 \\ C = c2 \\ D = d21, d22, d23 \end{cases}$$

where a11, a12 are authors etc.

Now let us we have P3 and P4. We get similar information and obtain the following:

$$P3 = \begin{cases} A = a31, a11 \\ B = b31, b1 \\ C = c3 \\ D = d31, d32, d13, d13 \end{cases} \quad \text{and} \quad P4 = \begin{cases} A = a41, a22 \\ B = b41, b2 \\ C = c4 \\ D = d41, d42, d43, d22 \end{cases}$$

We determine the number of common elements for each of the publications.

Publication P3 and P4 have some common characteristics of P1 and P2, and that's a11 (author), b1 (research institution) and d13 (keywords).

We have four sets, broken down by characteristics. Now we can combine multiply P1 .. P4 with common characteristics. Since P1 and P3 and P2 and P4 are joint authors, research institutions and key words, we obtain clusters {P1, P3} and {P2, P4}:

$$P1, P3 = \begin{cases} A = a11 \\ B = b1 \\ D = d13 \end{cases} \quad \text{and} \quad P2, P4 = \begin{cases} A = a22 \\ B = b2 \\ D = d22 \end{cases}$$

And now we have such schools Sch:

$$Sch1 = \{P1, P3\} \quad \text{and} \quad Sch2 = \{P2, P4\}$$

Having a loose bound allows to use the common quality definition method in the title of the publication.

Suppose there are certain titles C1, C2, C3. For example:

C1 = "Searching and saving information with the help of the web search engine"

C2 = "Review and saving files in the file System"

C3 = "Searching for information in the World Wide Web"

Let the titles be divided into two parts: right and left using the symmetric division in length. Suppose that the left part is more valuable in terms of its informative importance than the right half. The subjects are to be divided right and left and the common qualities are to be picked out. Words such as „and, so" should be ignored. Words with capital letters should not be ignored because there may be cases of it functioning as abbreviation. In addition the endings of the words should be cut-off. The result is

C1I=C3I= "searching, information",

C1I=C2I= "saving".

The created between the publications in which more than half of the words in the left column match is called the strong bound. Since C1I and C3I have two common names in their titles there is supposed to be strong relation between the publications P1 and P3. Therefore the titles C1I and C2I have a loose bound in their titles.

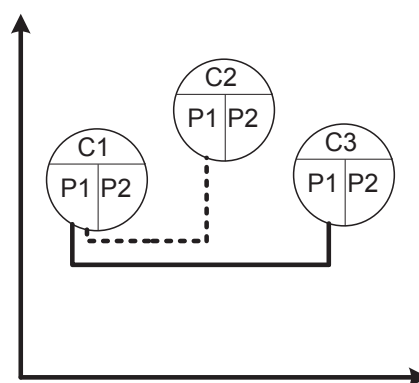


Fig. 1. Introduction of common features in the title of the publication

Such bounds between the titles can be applied for additional bound loading between the publications which in its turn may influence the process of decision making which of the existing

scientific schools the research publication refers to or if it is to be left for creating a new school.

3. APPROBATION

We have a three-tier architecture in the system analysis of publications (figure 2).

It consists of:

- lower level - working with data: processing database of scientific publications;
- level of business logic, where clustering is performed properly scientific publications and predict the development of scientific schools;
- level of presentation of data.

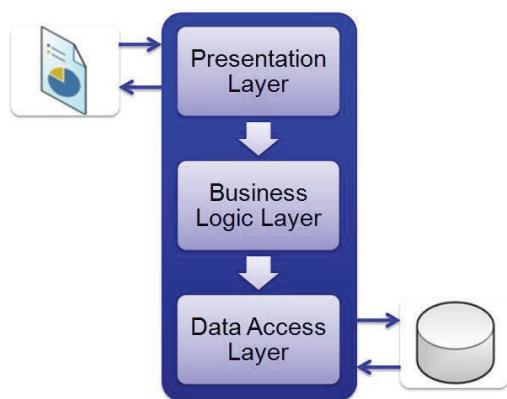


Fig.2 The system architecture.

The first stage of implementation is to design a database (DB). At the stage of system analysis, we found the essence of which exist in the subject area, and identified their attributes. All entities in varying degrees are reflected in the designed database. Let us describe the purpose of the database relations (figure 3).

- 1) Sentence is contains the information of all sentences in the publication. This entity has the following attributes: SentenceID, WordsWeight (Weight of words), Format (Format), Place (Place), Sum (amount);
- 2) Keywords (Key words) are contains all the keywords in the text. This entity has the following attributes: WordID, Word (word), Frequency (Frequency), Place (Place), Format (Format), UserWeight (weight user), Sum (amount);
- 3) Words-Sentence is contains the relationship between words and

sentences in the text. This entity has the following attributes: ID, WordID, SentenceID.

Designed database has entity StopWords, which has a purely official character, has the following attributes: ID, Word (figure 3).

And now we can construct an algorithm of filling databases of scientific publications. Input data for the reference to the publication of scientific school is the file containing the publication. In this file we need to define the basic characteristics of publication:

- *Author (s) of publication,*
- *Scientific institutions,.*
- *Topic publication,.*
- *Abstract,.*
- *Keywords,.*
- *Text.*

Algorithm to create a database publishing features involves:

Step 1 Scientific article as a structured text information is divided into sentences and words;

Step 2 There is discarded words that contain at least three characters;

Step 3 Word classification by removing from the total list of words contained in the relation "stop words" and useless words and phrases.

Step 4 The common list of words in a documents forming. We save information about their format and location in the text;

Step 5 The total word list is modified during stemming (the process for reducing inflected (or sometimes derived) words to their stem, base or root form—generally a written word form). We discard the end of words, remove words from the same database, but increases the value corresponding to the number of occurrences of the word frequency and weight that were previously assigned these words are added. Thus we form relation "Keywords";

One can make his keywords and determine their weight, thus guiding system for the selection of the information related to the keywords.

The relation "stop words" are part of the official languages, i.e., conjunctions and pronouns words and false otherwise.

Summarization algorithm is also based on the notion of loss clause, designed to articles analysis (Radev & McKeown, 1998).

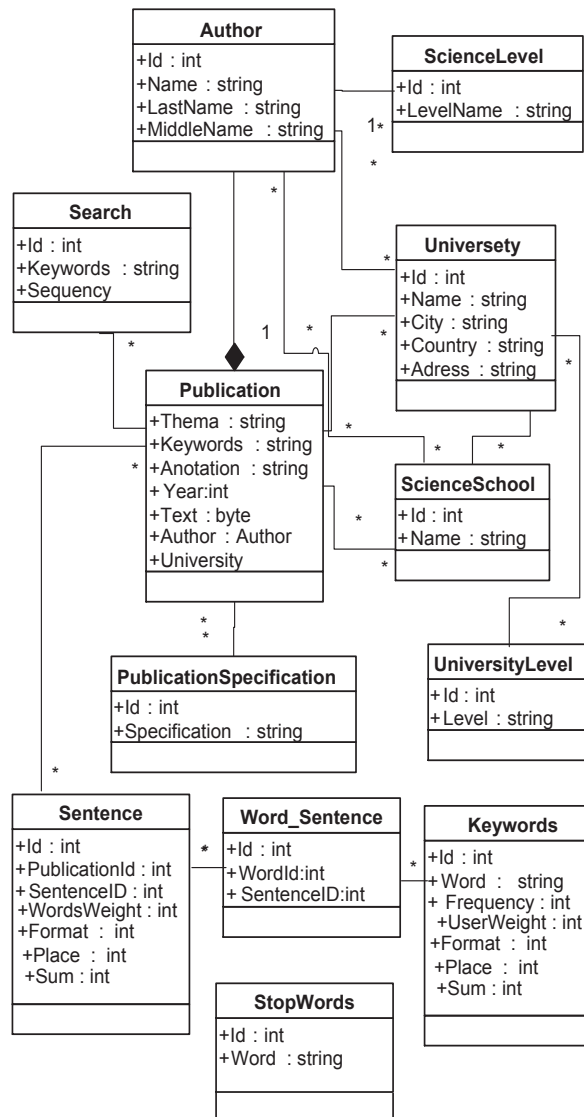


Fig. 3 The database schema

Basis analytic stage in this model is the procedure for the appointment of weights for each block of text according to characteristics such as the location of the block in the original, the frequency of appearance in the text, the frequency of key usage in sentences, as well as indicators of statistical significance. The sum of the individual weights of words and sentences tend to be determined after further modification according to specific settings associated with each weight, gives the total weight of the sentence U (Carbonell & Goldstein, 1998):

$$Weight(U) = WordWeight(U) + Place(U) + Format(U)$$

To form abstract there is out the sentence from main part.

The main part is divided into fragments by the departments and sections, introduced by the authors. Let us the sentence appearing in the introduction and conclusion are higher informative value than a sentence with the middle of the text.

The word weight Q we determine as:

$$Weight(Q) = Frequency(Q) + Place(Q) + Format(Q) + UserWeight(Q)$$

Frequency rate $Frequency(Q)$ is he ratio of occurrence of a word ($word$) to the total number of words ($words$) document. Thus, the estimated importance of words within a single document:

$$Frequency(Q) = \frac{word}{words} \cdot 100$$

The ratio $Place(Q)$ is defined as the location function of a part of the text of the article. Defining elements of the document based on selection of features of text (Ando, 2000):

- locations in the document,
- locations of paragraph (left, right, centered),
- type of writing (bold, italic, underline, normal nakeslennya),
- recognition character.

The formatting word ration $Format(Q)$ is determined depending on whether the word highlighted in bold, italic, or underlined. If the word is not formatted, the coefficient is 0 if one format is - 1 if two, then - 2 if three, then - 3.

The indicator $UseWeight(Q)$ is based on evaluation of speech user.

Record Entries parts whose weight exceeds the minimum specified, provides business-level application, shown in Figure 4.

PublicationHandling
+Model : CrudModel
+GetFile() : Publication
+ParseFile() : bool
-ReadUniversity() : Universety
-ReadAuthor() : Author
-ReadPublication() : Publication

Fig. 4. Business level system to extract information from a work file

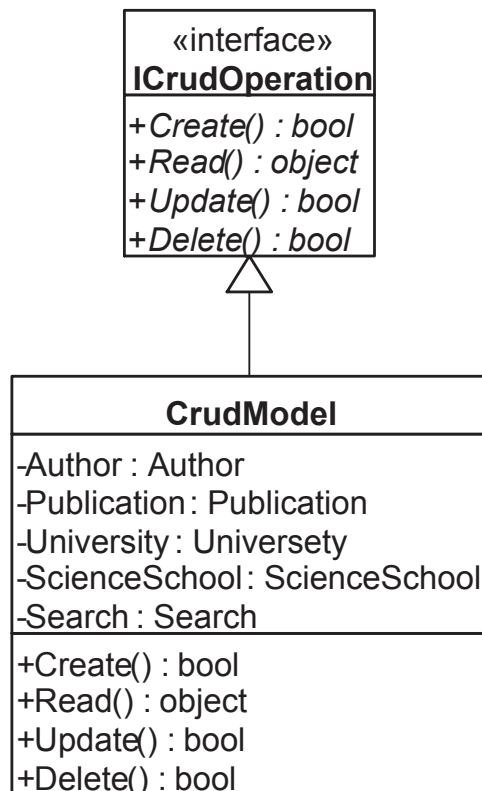


Fig. 5. Data working level

In the next step information is passed to the data level. Since this layer is responsible for working with the database, and there we write the data into the appropriate database table (Fig. 5).

Based on the data there is obtained by clustering scientific publications.

In the database that is shown in Fig. 3 there is a "Search" relation. The information in this relation is the input to predict the development of scientific schools. As mentioned above, another important criterion of scientific research development is to determine the school directly relevant specialized scientific topics and prospects of its development. With record users search for sources of information, it is advisable to develop a data analyzer determination of current topics.

The algorithm of the analyzer is not complicated. When searching for information a user enters data it is looking for, according searches the database for the presence of information sought. In the absence of data in the database, the user query written in the search table. So we will have a record that shows that the publication of this

topic is not considered. Also based on the entries in this table, we can search for current ratings.

And finally, most importantly, we can analyze which schools were engaged earlier similar topics, and inform them of the new current topic. Also, the person who is searching, we inform that schools deal with similar topics and / or specific people that you can contact. Analyzer algorithm is presented in Fig. 6.

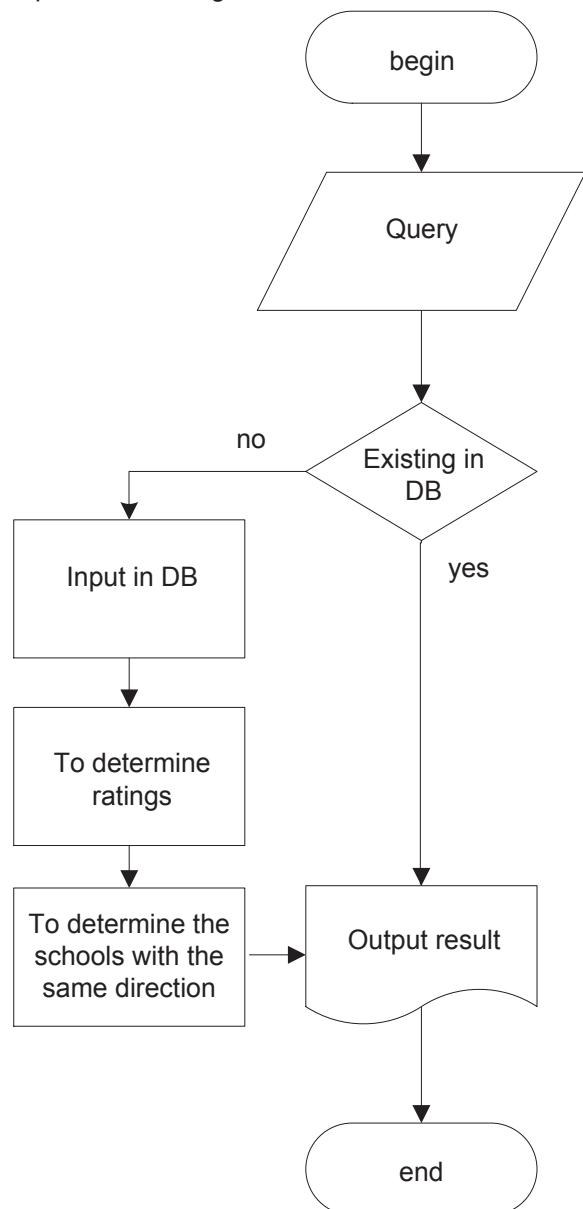


Fig. 6 Business-part of the analyzer for data retrieval

For work of this analyzer the level of the business will match and it will have the following form (Fig. 7).

The database is implemented in SQL Server 2005 database that allows you to use a large

arsenal of ready-made solutions for data analysis and texts.

SearchHandling
-Model : CrudModel
+SearchPublication() : bool
+GetScienceSchoolByKeyword\$: ScienceSchool
+GetAuthorByKeywords\$: Author
+ByKeywords\$: Search
+InsertNewKeywords\$: bool

Fig. 7 Business-part of the analyzer for data finding

Structure of database is defined by standards ANSI Z39.19, ISO 2788-1986, ISO 5964-1985, APA Sixth Edition 7.25-2001, APA Sixth Edition 7.24-90. Updating a document in the system is due to its analysis. As the documents differ both in format and content, it provides the ability to replenish empowerment for disassembly.

In module structuring documents transmitted there are tape that indicates the address of the file. Depending on where the file is, it can be a path to a file on the local disk or URL on the Internet.

To take into account effects associated with differences subjective knowledge receiver and transmitter in communication processes, which are the consequences of different amounts of knowledge in software, there is used thesaurus model that relates the semantic properties of information the user with the ability to perceive information.

Updating a document in the system is due to its analysis. As the documents differ both in format and content, it provides the ability to replenish empowerment for disassembly.

In module structuring documents transmitted there are tape that indicates the address of the file. Depending on where the file is, it can be a path to a file on the local disk or URL on the Internet.

To describe the metadata there is recommended to apply a basic set of elements of Dublin Core. The concept of metadata is used in many communities, including governments, libraries, educational institutions and commercial companies. So, it will be easier to integrate the system with other. This document is of a hierarchical structure that contains metadata for all sections regardless of the depth of nesting and all resources such as images and tables.

For approbation we analyzed 208 scientific publications and have result of publication clustering:

Relation database	Count
Lviv Polytechnic National University	42
Kharkiv National University of Radioelectronics	42
Ternopil State University	27
Cloud computing	
National Technical University of Ukraine: KPI	45
National Aerospace University	32
Lviv Polytechnic National University	28

4. CONCLUSIONS

In this paper the method of common quality definition for research publications and their clustering has been introduced. Clustering is used to sort out the information about scientific schools. The method of finding the bound between the research publication and the research school it refers to has been developed. We have a three-tier architecture in the system analysis of publications. The sum of the individual weights of words and sentences tend to be determined after further modification according to specific settings associated with each weight, gives the total weight of the sentence. The algorithym of publication analyzer is built. The database for publication and its elemens storage is designed.

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POSSIBLE APPROACH TO PROTECTION OF CRITICAL INFRASTRUCTURE ELEMENT IN TRANSPORT SECTOR

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Abstract:

Transportation infrastructure belongs between the most important economic elements of every government. It provides exchange of goods and services, participating by considerable degree on generation of GDP. Every disruption of transportation infrastructure causes financial losses. It paralyzes the economy on local, regional or national and transnational level. Road bridges belong to the important elements of transportation infrastructure. Those belonging to highway network or European road network are of especially significant importance. Every damage or disruption of such element results in partial distortion of goods exchange system (truck transport), which damages the economic interests and relations on individual levels of government administration. Possible solution for prevention of, particularly, deliberate attacks on these elements, is their protection. This article contains the proposal of possible approach to protection of road bridge as an element of critical transportation. The approach featured in it is applied to model referential object (protected object) and therefore the data which are used in the proposal have only the illustrational character.

Keywords:

protection, security, transport, critical infrastructure, sector, element, road bridges, referential object, security analysis

1 INTRODUCTION

Transportation infrastructure belongs between the national economic pillars of nearly every government. Its significance increases in recent period. Transnational exchange of goods, as well

as the national one gradually re-oriented to road transportation. Every delay caused by malfunction or reduction of functionality of road communications eventually causes, inter alia, also high material damages. Set logistic systems require supply of goods or services in exactly set time. Every delay causes secondary or tertiary harmful consequences. Internationalization of trade cooperation that overreaches the

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framework of national level allows the effectiveness of national economics, but also their disruption. Even several day long service outages, e.g. caused by late delivery, may cause the production to stop, etc. These damages are hardly calculable in current time. For the purpose of securing of fluency in road transportation it is necessary to accept preventive measures to prevent these losses and damages.

In recent period, a new phenomenon arose, with goal of road traffic disruption – terrorism. Its objects of interest contain also international transportation communications. It is possible to include road tunnels and road bridges into this category. These object become potential targets of terroristic attacks because they are freely and uncontrollably available. European Union, as well as its member states, accepts complex measures to fight terrorism. One of these is also protection of those elements that may threaten or disrupt fluency of economic, or threaten human lives and health of the citizens. In general these elements are labelled as critical infrastructure elements. Some of these elements included in the transportation sector are road tunnels and road bridges.

For the purposes of this article, a road bridge (referential object) located on international road network has been selected as a model case of critical infrastructure element. Its economic importance exceeds national level. Possible approach to increase of its level of protection against identified security risks shall be demonstrated on this object.

Following algorithm for creation of security measures proposal to increase protection level of model object shall be applied on this model case:

1. Determination of the context – security analysis of the environment.
2. Risk identification – risk area identification, risk categorization.
3. Risk analysis – determination of probability and consequences, determination of risk degree.
4. Risk evaluation – identification of acceptable and unacceptable risks.
5. Managing the risk – proposal of security measures lowering the unacceptable risks to an acceptable level. (Vidriková & Boc, 2013)

2 SECURITY ANALYSIS OF THE REFERENTIAL OBJECT ENVIRONMENT

The goal of environment security analysis of referential object is to acquire objective information about security environment, based on which it will be possible to identify relevant security risks. It contains systematic process of acquiring, gathering and processing information about those environmental characteristics which constitute the source of security risks and threats to protected referential object.

The subject of environment security analysis of referential object is information about those entities that may, after fulfilment of certain conditions, cause the damaging consequence. Within this security analysis all entities which might have causal relation to the functionality and security of referential object are evaluated. In practice, the environment security analysis consists of search for causal relations and relations between the surroundings and protected referential object. It consists mostly of:

1. description of referential object and identification of assets that would in case of their disruption or destruction significantly unfavourable consequences on the economic and social function of state or region, and consequently on the life quality of its citizens from the viewpoint of protection of their lives, health, security, property, as well as their living environment,
2. external environment analysis – analysis of the surroundings of referential object,
3. internal environment analysis,
4. identification and evaluation of security risks,
5. managing of the security risks – proposal of measures.

2.1 Description of the referential object model

The referential object is located in the district town Michalovce in the Košice region by the E50 road. This road leads to Slovak-Ukraine borders (e.g. border crossing Vyšné Nemecké – Uzhgorod). It bridges the Zálužice channel. This route is used for the international goods transportation. Average daily intensity is 8137 vehicles, which makes 338 vehicles per hour. Referential object can be placed between

potential elements of critical infrastructure in the transportation sector, subsector road traffic. In regard to its placement it may be a subject of terroristic attack. Its destruction would limit economic operation of the state and could disrupt the transit function of the state within European Union. No detour is located on the selected transportation segment, which could solve the possible exclusion of the road bridge.

2.1.1 Basic characteristic of the referential object

Referential object (hereinafter "bridge object") bridges the urban area of the Michalovce city and crosses the Zálužice channel. The road on bridge object is D 26,5/100 category. Free width of roadway is 2 x 12 m on the bridge. The bridge has perpendicular distribution, in the longitudinal direction it is in constant gradient. The supporting structure consists of continuous girder. It consists of unicameral cross-section with bridge cantilevers which are supported by prefabricated brace bars. The thickness of the upper slab is 0.5 m. The crossbeams contain openings 1.8 m wide and 2.4 m high, allowing the passage through the bridge (the bridge object chamber). The supporting structure crossbeams are preloaded

by cables tensioned in pre-stressing - 1320 MPa. The roadway is 90 mm thick bitumen. Monolithic concrete crash barriers 1100 mm high, class of restraint H3 (STN EN 1317-2) and deformation depth of 1440mm are built at the edges of roadway.

Other characteristics of the bridge object (Technická správa)

Single-deck, permanent, immobile road bridge with upper bridge deck
Bridge length: 85 m
Length of the bridge object: 100 m
Obliqueness of the bridge object: $\alpha = 100g$
Width between crash barriers: 2x 12 m
Width between outermost crash barriers: 27.5 m
Total width of the bridge object: 31m
Bridge object height: 30.8 m
Overall height: 4.7 – 6 m
Maximum height of the bridge object: 39.0 m
Maximum height of the bridge object including the pylons: 53.0 m (Pillar no. 3)
Area of the bridge object: $518 \times 2 \times 11.75 = 1024.25 \text{ m}^2$
Load of the bridge object: LM 1 according to STN EN 1991-2. (STN EN 1991-2)

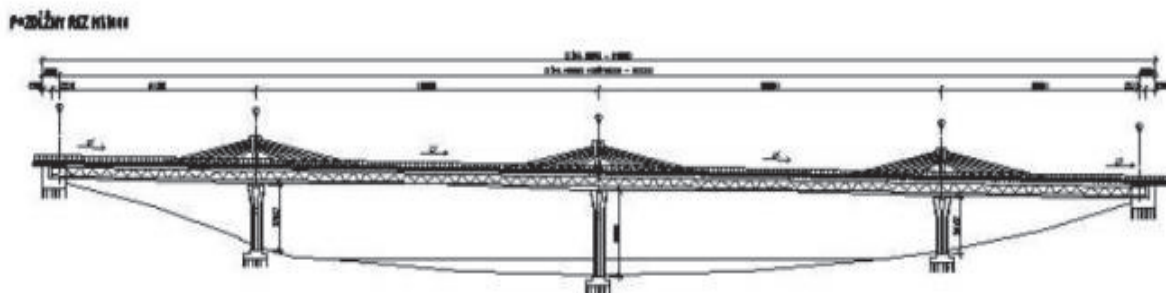


Fig. 1 Side view of the bridge object (Technická správa)

Accessories

- *roadbed* – total thickness of the roadbed is 90 mm (including full isolation), consists of bitumen;
- *security devices of bridge object* – they consist of concrete wall, which is constraint into bridge deck supporting structure 1100 mm high over the roadbed; the edges of model bridge object are secured by the concrete barriers in the height of 1100 mm;

- *anti-noise measures* – are located at both edges of the bridge object on the walls of outer channel grating.

Bridge object is designed in such way that it resists hurricane-grade wind (speed of 110 km per hour). The weakest places of this object are mainly:

- technical space and
- bridge deck.

2.2 Security environment analysis (search for connections)

Within the security environment analysis the external and internal connections (parameters) are sought. These need to be taken into account in the risk management and determination of security scope and criteria of risks (Belan, 2013), that, when activated, could endanger the protected object.

Security risk encompasses protection of property from the damages caused by the deliberate actions. Security risk is understood as event that could lead to endangerment of the referential object, e.g. by unauthorized intervention into its structure. (STN ISO 31000) (STN 01 0380) (STN EN 31010)

2.2.1 Analysis of the external security environment (external connections)

Analysis of the external security environment is carried out for the purpose of assessment of all eligible security risk sources of the bridge object. For the purposes of this article, we consider its immediate surroundings to be the external security environment. Following characteristics of the environment are analysed:

- Geographical.
- Hydrometeorological.
- Demographical.
- Criminal.
- Dislocation and structure of the security forces.

Analysis of the listed characteristics is related solely to the potential sources of security risks, which may endanger the referential object and its identified assets.

2.2.1.1 Geographical characteristic of the bridge object environment

The bridge object is located in the Michalovce district. This district is one of the larger districts within the Košice region. It covers area of more than 1000 km². It is adjacent to Sobrance district from the eastern side, to Humenné and Vranov nad Topľou districts, that belong to the region of Prešov, the eastern border of the district is also the state border of Ukraine. The Vihorlat Mountains encroach upon the district area from the northern side and the East Slovak Lowland covers most of its area. On the north-east,

Vihorlat Mountains extend, inhibiting the air flow from the north. (www.michalovce.sk/article-msp-76, 2013) The Slanské Hills stretch out from the western side. Vihorlat Mountains are of volcanic origin and Vihorlat is their highest peak. Except for the volcanic origin, the mountain range of these mountains is also characterized by potential earthquakes caused by tectonic faults. The city of Michalovce is considered to be the administrative centre of the district.



Fig. 2 Michalovce district map (modified by the author according to (<https://maps.google.sk>, 2013))

2.2.1.2 Hydrometeorologic characteristics of the bridge object environment

The territory of Michalovce is dewatered by the river Laborec, which belongs to the river basin of the river Bodrog (see Figure 3). Rivers Latorica and Bodrog are flowing in this area from Ukraine. The territory has insufficient slope to provide enough drainage for surface waters and prevent regular floods. Despite the conducted treatment of watercourses, yearly flood occur. The river basin of rivers Ondava and Laborec belong to the most hazardous rivers. (www.michalovce.sk/article-msp-76, 2013)

Security environment of the bridge object is, when taking into account the hydrometeorology,

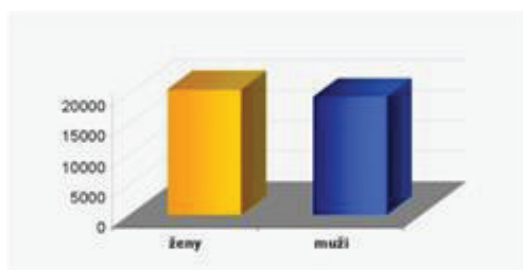


Fig. 3 Bodrog river basin (modified by the author according to (<http://www.alcea.sk/rieky-regionu.html>, 2013))

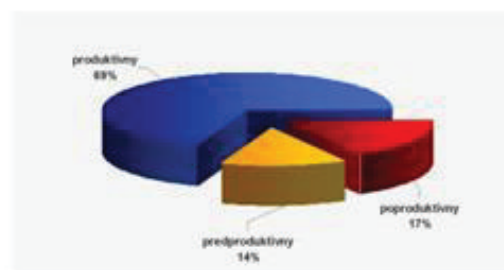
threatened by torrential rain and storms, which in turn cause the floods and landslides related to them. (www.michalovce.sk/article-msp-76, 2013) Reservoir Zemplínska Šírava is located in the vicinity of Michalovce. In 2000, a flood situation occurred, in which centenarian water level was exceeded on the river Bodrog (Figure 3).

2.2.1.3 Demographic characteristic of the bridge object environment

Population of Michalovce district was 110 897 in year 2011. The district consists of 75 municipalities and of cities Michalovce, Strážske a Veľké Kapušany. The population consists mainly of citizens of Slovak, Romani and Hungarian nationality, with average age of 37.25 years. The Roma living in settlements are carriers of the indebtedness, low education level, unemployment or criminality. (Rokovania vlády Slovenskej republiky, 2013)



men - 19 275
women - 20 536



Age structure of population
preproductive (0-14) - 5 536
productive (15-60) - 27 404
post-productive (>60) - 6 871

Fig. 4 Population demographics of the Michalovce city environment (modified by the author according to (<http://www.michalovce.sk>, 2013))

Table 1. Unemployment progress in Michalovce city in years 2008 – 2011 (modified by the author according to (<http://www.michalovce.sk>, 2013))

Unemployed	2008	2009	2010	2011
Men	1061	1525	1492	1542
Woman	983	1314	1331	1416
Total unemployment	3469	2909	2490	2064
Registered unemployment rate (%)	7,71	10,71	10,49	11,47

Unemployed persons count in 2011 reached in the Michalovce district the number of 8 647 persons, what represents 19.40%. Directly in the city it reaches 11.47% (Figure 5- 6).

Most of the applicants for employment within the Michalovce district (as well as in the Michalovce city) finished secondary vocational education at the secondary vocational school (district – 2995, city – 818 persons) and the second most prominent group was the persons who finished

elementary or secondary education (district – 288 persons, and city – 552291 persons). The gross wage in year 2011 reached 786 €. (Rokovania vlády Slovenskej republiky, 2013)

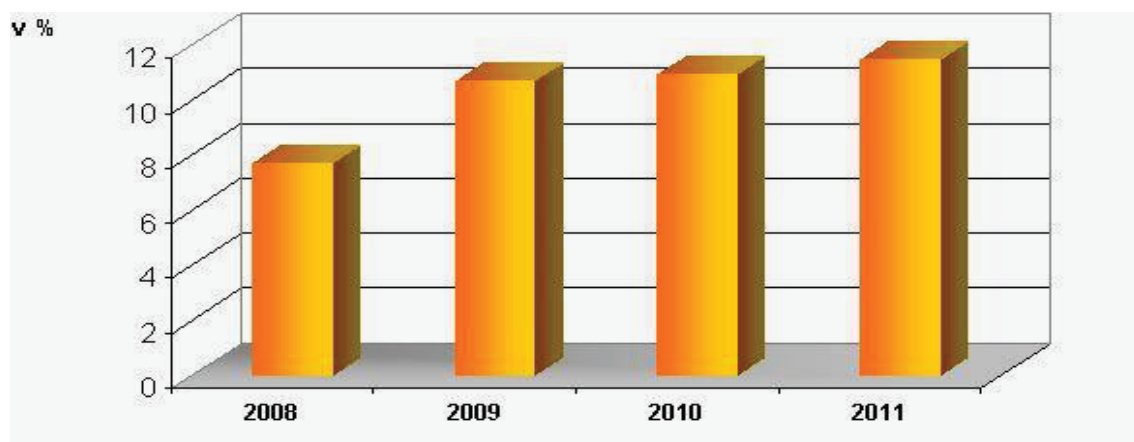


Fig. 5. Development dynamics of the unemployment in Michalovce city in years 2008-2011. (modified by the author according to (<http://www.michalovce.sk>, 2013))

Table 2. Structure of the unemployment according to the level of achieved education (modified by the author according to (<http://www.michalovce.sk>, 2013))

Education	2008	2009	2010	2011
0 – no education	121	130	155	138
1 – elementary education	382	432	417	418
2 – secondary vocational school trained	584	871	779	818
3 – secondary vocational school without graduation	7	3	4	4
4 – secondary vocational school with graduation	227	332	322	365
5 – secondary grammar school	97	134	158	167
6 – secondary technical school	468	678	677	686
7 – higher secondary education	19	44	72	82
8 – university	139	214	236	277
9 – scientific education	0	1	3	3
Total number of recorded unemployed persons	2044	2839	2823	2958

2.2.1.4 Crime

Crime activities in Michalovce district are shown in table 3.

Table 3. General criminality in the Michalovce district in 2012 (modified by the author according to (<http://www.minv.sk>, 2013))

General crime activity in year 2012		
Type/region - district	Michalovce district	Košice region
Property	861	6620
Vice	37	187
Violent	141	1157
Other	283	1466
Overall	1322	9430

The dominant type of crime in the external environment of the bridge object in 2012 was mainly the property crime. Especially the crimes connected with theft of metals increased. Bridge object may thusly become a potential target mainly for of the perpetrators of this crime activity (individual metal parts – ropes, retaining safety devices, etc.). Possibility of other unlawful activities (e.g. terroristic attack) is not affected by this statement, despite the fact, that this kind of criminal activities has not been registered or detected in the analysed environmental surroundings of the referential object.

2.2.1.5 Structure of the security forces

Structure of the security forces in the area of bridge object consists of:

- District head office of the Police Force, which resides circa 2 km from the bridge object. Arrival of the Police Force members to the bridge object for the purposes of intervention is 4 minutes.
- Municipal Police has 26 members and 6 employees. Its distance from the bridge object is 3.1 km. Intervention is possible within 5 minutes. (www.michalovce.sk/article-msp-76, 2013)
- Private security services – 11 companies operate within the concerned environment. The concentration of their locations of residence allows the intervention units to execute their intervention in time between 5 and 10 minutes.

2.2.2 Analysis of the internal security environment (internal connections)

Analysis of the internal security environment is focused on the existing status of the security of the bridge object, especially of its assets (technical spaces, bridge deck). Existing security measures and their effectiveness (especially for the mechanical means of protection, electronic security signalling, organizational or regime measures, etc.) are analysed in the next part. In this case, technical spaces and bridge deck are analysed.

2.2.2.1 Technical space (overpass chamber)

Entry into the overpass chamber is secured by a single main entrance. This entrance is protected by steel door. Door has size of 800x1970 mm and is of the security class 3. They are able to resist attacks of vandals and force of 3 kN exerted on point and to resist static load of 6 kN and attack with crowbar of length up to 710 mm. The door is protected from opening by a construction lock with cylinder housing that protects it against its breaking. No active protection elements are used for securing of the chamber. (Technická správa)

2.2.2.2 Bridge deck

Bridge deck is freely accessible. Overview of the vehicles or other traffic participants is not provided. It is illuminated at night. By the edge of bridge deck are placed the barriers, which protect its edges.

2.2.3 Partial conclusion

Physical protection of the object is not executed. Only visual control of technological space and bridge deck is carried out on regular basis (twice a year). The administrator has no regime or organizational measures drawn up for protection of object. No documentation is created, which would adjust the procedures after detection of security incident or if there is suspicion of possible intrusion into object. It is necessary to assess the security of the model object from the viewpoint of existence of the internal security risks.

2.3 Identification of security risks

Following security risks threatening the assets of the bridge object were identified on the basis of security analysis of its internal and external environment:

1. External security risks influencing both identified assets:

a) Natural risks:

- *floods* – caused by the gradient of the area,
- *landslide* as the result of floods and instability of the geologic bedrock (disruption of static of the whole object),
- *flood wave* caused by rupture of the water dam Zemplínska Šírava, with pressure of 96 kN (9600 kg) it may cause total disruption of the object's statics – especially the supporting pillars,
- *earthquake* caused by tectonic failures could disrupt the statics of the bridge object,
- *critically low temperatures* – may influence negatively the traffic on the bridge object, which creates precondition for chain road accidents and the secondary result is negative influence on the condition of bridge deck, as well as the supporting pillars,
- *tempest* – road accident may be caused due to high speed of the wind, especially with the TIR vehicles transporting substances included into the category ADR (e.g. chain road accident – damage to bridge deck and its components).

b) Social (criminal) risks

- *criminal activities of property character* – theft of metal materials – disruption of the object statics, removal of mechanical means

of protection that secure the overpass chamber and creation of conditions for further antisocial activities,

- *terrorism* – utilization of the explosive devices may cause disruption of bridge deck, supporting pillars or other construction parts of the object, which may in significant way disrupt the road traffic indefinitely,
- *traffic accident* – mainly of the vehicles that transport material classified into category ADR (whether intentional or by negligence).

2. Internal security risks that influence both assets:

a) Technical risks

- *material fatigue* – degradation process of irreversible changes of characteristics and status changed by fatigue of the construction materials developed by its repeated mechanical, thermal, or thermomechanical loading with simultaneous interaction of other factors induced by oscillatory (cyclical) loading. Highly stressed parts of the bridge construction in whole cross-section or in place of tension concentration are often disrupted by the cyclicity fatigue, mainly with relatively negligible amplitudes of loading and nearly immeasurable amplitudes of plastic deformation,
- *fatigue break* – if the fatigue strength is exceeded, in the place within the bridge deck or pillar, where the tension concentration occurs, may originate a breach after certain number of cycles, and this may gradually spread into the depth of material. This diminishes the supporting cross-section of the component up to the moment when the tensions induced by immediate loading exceed the fatigue strength and static breach originates in the remaining cross-section,
- *fatigue lifetime* – the change of the mechanical characteristics of the bridge deck, pillar, or overpass chamber may cause gradual nucleation and spreading of the breaches, which will culminate into final sudden breach, without former macrodeformation of the concerned assets material. This may significantly weaken the supporting cross-section of bridge deck, as well as other parts of the object.

b) Social (criminal) risks:

- *criminal activities of the property character* – theft of the metal materials by internal employee of the object administrator – disruption of the object statics, removal of mechanical means of protection that provide security of overpass chamber and creation of conditions for further antisocial activities,
- *terrorism* – internal perpetrator, motivated by different incentives (dissatisfaction with financial remuneration, revenge, inability to cope with discharge, etc.) utilizing explosive devices may intentionally disrupt the compatibility and stability of the bridge deck, supporting pillars and other construction parts of the object, which may in significant way disrupt the road traffic indefinitely if the risk activates,
- *sabotage* – intentional conduct of the object administrator's employee may in the form of damage to object's integrity for the purpose of disruption or obstruction of its utilization (failure to perform the control activities, biased evaluation of existing status, unreported fatigue change of supporting parts of the project, etc.),
- *leak of information of technical character* caused by employee, may expose the weak points of the model referential object.

2.4 Risk evaluation

Risks that may threaten the model road bridge and thusly cause its partial or total disruption were identified by the analysis of connections. These risks are expressed in the risk registry (Table 4). Identified risks were classified according to their severity. Their assessment was based on the mathematical model of risk:

$$R = P \times C \quad (1)$$

where R – risk,

P – probability of its occurrence,

C – consequence (It is necessary to determine the probability of the risk occurrence as well as the consequence by qualitative or quantitative methods. For the purpose of this article this step has been left out).

Table 4. Registry of the identified security risks (authors)

Risk sphere	Risk type	Form of expression	Causes, sources	P	C	R
Internal security risks	Social risks	Terrorism (bridge deck, chamber)	Dissatisfaction of the employee	3	4	VH
		Theft of material (bridge deck, chamber)	Enrichment	3	3	H
		Information leak of technical character	Dissatisfaction of the employee	3	3	H
		Sabotage – insufficient control activity	Not reacting to detected failures	2	3	M
	Technical risks	Material fatigue (bridge deck, chamber)	Not reacting to detected failures	2	3	M
External security risks	Social risks	Theft of material (bridge deck, chamber)	Enrichment	3	2	H
		Terrorism	Terroristic attack	2	5	VH
		Traffic accident	Negligence	4	3	H
	Natural risks	Flood wave	Dam rupture	2	5	VH
		Earthquake	Tectonic failures	3	2	M
		Tempest	Climate	4	1	M
		Overspill of Laborec river	Torrential rain	4	4	VH
		Critically low temperatures	Climate	4	1	M

L- low risk, M- medium risk, H – high risk, VH- very high risk.

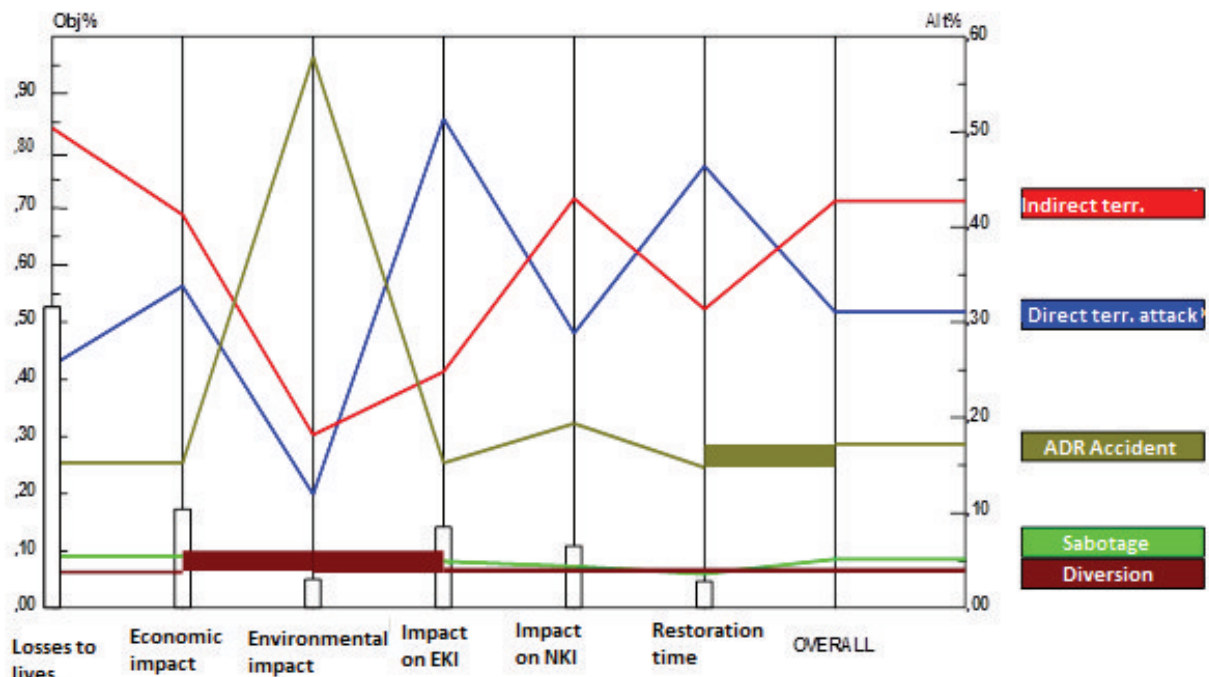


Fig. 6. Evaluation of the security risk severity (authors)

Severity evaluation of the security risks was assessed with the use of hierarchic process analysis (Figure 6). The criterion of evaluation and subsequent acceptability were the consequences, such as:

- losses to lives,
- economic impact,
- impact on foreign trade within EU,
- impact on national economy,
- damage to the environment,
- length of restoration.

Based on the hierarchic process analysis, following security risks were prioritized according to their severity:

1. *Direct terroristic attack (A)* – may be carried out in the supporting construction, by placing the explosive system into the overpass chamber, which would cause significant damage to the bridge gap, as well as the exclusion of usability of the model referential object for its purpose – that may cause significant economic losses, as well as losses to the lives and damage to health of persons located in that time on the bridge deck or near the object
2. *Indirect terroristic attack (B)* – related to execution of terroristic attack on the water dam Zemplínska Šírava. Deliberate damage to the dam would cause flooding of the road bridge, as well as the whole surrounding.
3. *Enrichment (C)* – theft of the material.
4. *Sabotage (D)* – criminal activity of the employees.
5. *ADR Accident (E)* – transportation of dangerous substances and subsequent accident originating during the transportation could damage the bridge deck and could influence the environment depending on the type of the transported substance.

Significance of individual risks was determined on the basis of the hierarchic processes analysis. Included between the risks with the greatest consequences are indirect terroristic attack, direct terroristic attack, accident during transportation of dangerous substances, sabotage and diversion.

2.5 Security risks management

The process of risk management consists mainly of the selection of the way the risk will be

manipulated. The selection of way is the search for optimal solution. It has to be a compromise between costs and effort, which will be expended for its realization, and the benefits of the selected variant of risk management.

The risk management methods are mainly the following:

- risk avoidance,
- acceptance or increase of the risk for the purpose of achievement and exploitation of the opportunity,
- removal of the risk source,
- change of the probability of risk occurrence,
- change of the consequence magnitude,
- sharing of the risk with other subjects,
- maintaining of the risk on the basis of informed decision. (STN ISO 31000)

The method of managing the assessed and prioritized security risks in the case of model bridge object is the change of the consequence magnitude. For its achievement, whole complex system of security precautions (integrated security system – ISS) shall be realized. ISS consists of the following elements:

- mechanical security systems,
- physical protection,
- alarm security systems,
- organizational and regime measures.

3 PROPOSAL OF THE SECURITY PLAN FOR PROTECTION OF MODEL CRITICAL INFRASTRUCTURE ELEMENT

The designing of the variants of security plan for protection of model critical infrastructure element shall be based on the character and consequences of potential threat, the result of the initiation of security risk and its consequences.

3.1 Proposal of the Standard Security

Security plan shall consist of the security measure proposals that decrease the consequences of the identified and prioritized risks. The basic task during the design of the individual security plan variants shall be to decrease the level of external and internal security risks to the acceptable level. The standard variant is referred to only for illustration (sub-chapters 3.2 and 3.3).

3.2 Securing of the external and internal environment from terroristic attack, sabotage or diversion

Protection of the external surroundings of the model referential object:

External surroundings of the model referential object shall be monitored by surveillance system 180° (Figures 7 and 8) with infrared reflectors. The video signal shall have its output at the alarm receiving centre of the Municipal Police in Michalovce. This surveillance system shall constantly monitor the set area.

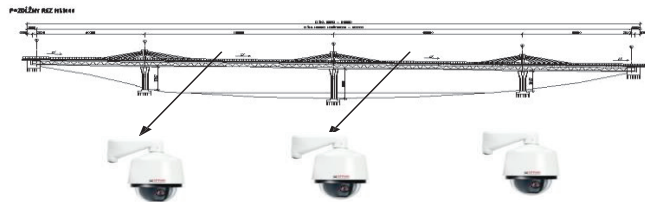


Fig. 7. and 8. CCTV 180° with IR reflector

Protection of the internal environment:

Entry door to the overpass chamber are to be completed by independent resistance class 3 security locks. (STN EN 1627) The door hinges shall be protected against their removal. Internal entry space into the supporting construction shall be completed by installation of movement

detector with IR camera system (Figure 11), fire detector, as well as the shock detector, which will be connected to the alarm receiving centre of the Municipal Police in Michalovce (ARC McP). After intrusion into the supporting construction the image shall be sent into the control room and subsequently to the external sirens.

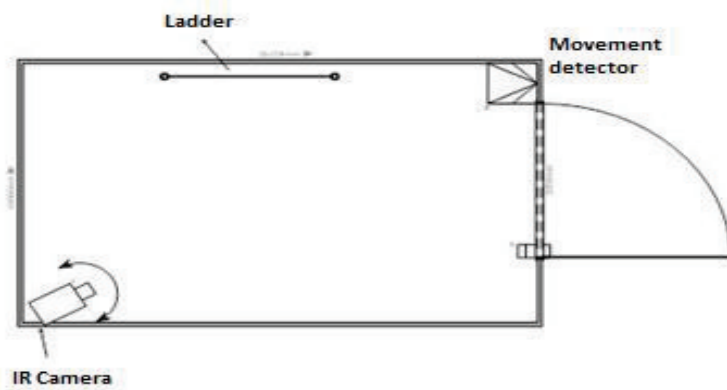


Fig. 9. Means for securing of entry into the supporting construction

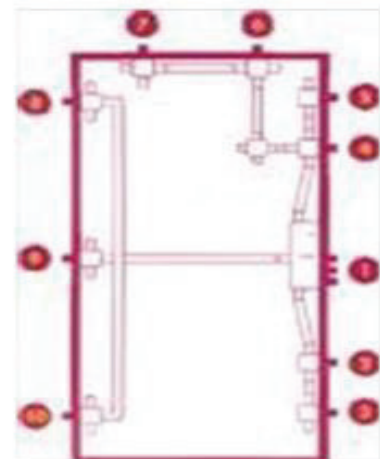


Fig. 10. Illustration of point security (authors)

Concrete shields (breakwaters), shall be installed on individual pillars of the model referential object in the height of the flood wave. These could

protect the bridge pillars from damage or disruption of statics by flood wave in case of terroristic attack on the Zemplínska Šírava dam.

Cross-section of pillar 2

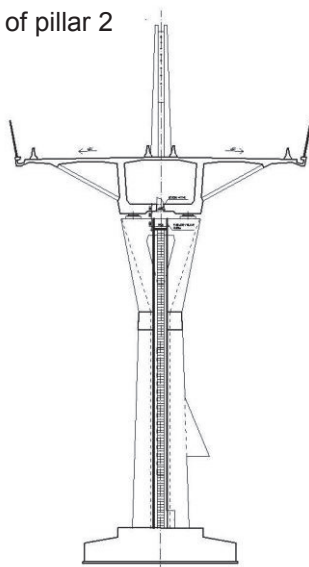


Fig. 11. Cross-section by pillar with a breakwater (Technická správa)

3.3 Securing of the model road bridge deck

Securing of the bridge deck from damage will be possible by lowering the maximum allowed speed

of vehicles to 60 km/h and by installation of CCTV system connected to the ARC McP. Supervision by members of the Police force shall be carried out irregularly in this segment. (Figure 12).



Fig. 12. Depiction of the location of model road bridge and Zemplínska Šírava dam
(Wikimapia. Zemplínska Šírava., 2013<http://wikimapia.org>)

4 CONCLUSIONS

Goal of this article was to outline an algorithm for design of protection plan for element of critical infrastructure. The proposed algorithm accepts the valid technical standards that regulate the security risk management as well as the requirements of legislation (e.g. Act no. 45/2001

Coll. on protection of critical infrastructure). When designing specific elements of the ISS, especially during selection of mechanical means of protection and alarm intrusion systems, it is necessary to follow the valid technical standards that regulate the security classes of the proposed elements, or, respectively, the breach resistance classes.

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THE IMPORTANCE OF GLOBAL MARKETING

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Abstract

Consider the following proposition: We live in a global marketplace. McDonald's restaurants, Sony digital TVs, Lego toys, Swatch watches, Burberry trench coats, and Caterpillar earthmoving equipment are found practically everywhere on the planet. Global companies are fierce rivals in key markets.

Now consider a second proposition: We live in a world in which markets are local. In China, for example, Yum Brands' new East Dawning fast-food chain competes with local restaurants such as New Asia Snack. What to choose?

Keywords: environment, change, entrepreneurship, consumer, success, manager, global marketing

1 INTRODUCTION

The largest single market in the world in terms of national income, the United States, represents roughly 25 percent of the total world market for all products and services. U.S. companies that wish to achieve maximum growth potential must "go global" because 75 percent of the world market potential is outside their home country. Management at Coca-Cola clearly understood this and about 75 percent of the company's operation income and two-thirds of its operating revenue are generated outside North America. Non U.S. companies have an even greater motivation to seek market opportunities beyond their own borders; their opportunities include the 300 million people in the United States. For example, even though the dollar value of the

home market for Japanese companies is the second largest in the world (after the United States), the market outside Japan is 85 percent of the world potential for Japanese companies. For European countries, the picture is even more dramatic. Even though Germany is the largest single country market in Europe, 94 percent of the world market potential for German companies is outside Germany.

2 THE IMPORTANCE OF GLOBAL MARKETING

Many companies have recognized the importance of conducting business activities outside their home country. Industries that were essentially national in scope only a few years ago are dominated today by a handful of global companies. In most industries, the companies that will survive and prosper in the twenty-first century will be global enterprise. Some companies that fail to formulate adequate

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responses to the challenges and opportunities of globalization will be absorbed by more dynamic, visionary enterprises. Others will undergo wrenching transformations and, if the effort succeeds, will emerge from the process greatly transformed. Some companies will simply disappear. Table 1.1 list of the top 25 of *Fortune* magazine's 2008 ranking of the 500 largest service and manufacturing companies by revenues.

Two of the companies in the top 10 are giants in the global auto industry; GM and Toyota. Measured by market capitalization, Toyota

(ranked fifth in revenue) is the world's most valuable car company. Today, Toyota sells more cars worldwide than GM; its market capitalization (roughly \$200 billion) is nearly equal to the combined valuations of the eight leading Western automakers! Clearly, Toyota is doing something right. Oil companies occupy half of the spots in the top 10 rankings by revenues; ExxonMobil also ranked first in profitability in the *Fortune* Global 500. This showing is not surprising given the recent surge in oil prices. Wal-Mart, the world's made the biggest strategy over the next few years.

Table 1.1 The Fortune Global 500: Largest Corporations by Revenues

	Company	Revenues (US\$ millions)
1	Wal-Mart Stores (USA)	378.799
2	Exxon Mobil (USA)	372.824
3	Royal Dutch/Shell Group (UK/Netherlands)	355.782
4	BP (Britain)	291.438
5	Toyota Motor (Japan)	230.201
6	Chevron (USA)	210.783
7	ING Group (Netherlands)	201.516
8	Total (France)	187.280
9	General Motors (USA)	182.347
...	...	...
24	State Grid (China)	132.885
25	China National Petroleum (China)	129.798

Source: Adopted from "The Fortune Global 500" (Fortune, 2008, p. 113) Time rights reserved.
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Table 1.2 How big is the market I? Consumer Products

Products or Service	Size of Market	Key Players and Brands
Cigarettes	\$ 295 billion	Philip Morris International (USA); British American Tobacco (UK); Japan Tobacco (Japan)
Luxury goods	\$ 230 billion	LUMH Group (France); Richmond (Switzerland); PPR (France)
Cosmetics	\$ 200 billion	L'Oreal SA (France); Estee Lauder (USA); Shiseido (Japan); Procter & Gamble (USA)
Personal Computers	\$ 175 billion	Hewlett-Packard (USA); Dell (USA); Acer (Taiwan); Lenovo (China)
Flat-screen TVs	\$ 100 billion	Samsung (South Korea); Sony (Japan); LG (South Korea)
Bottled water	\$ 100 billion	Nestle (Switzerland); Groupe Danone (France); Coca-Cola (USA), PepsiCo (USA)
White goods	\$ 85 billion	Whirlpool (USA); Electrolux (Sweden); Bosch-Siemens (Germany) (major appliances)
Cell phones	\$ 60 billion	Nokia (Finland); Motorola (USA); Eriksson (Sweden); Samsung (South Korea)
Video games	\$ 43 billion	Nintendo (Japan); Sony (Japan); Microsoft (USA)
Recorded music	\$ 32 billion	Sony BMG (Japan); Warner Music (USA); EMI (UK); Universal Group (France)

Source: Compiled by the author

Examining the size of individual product markets, measured in terms of annual sales, provides another perspective on global marketing's importance. Many of the companies identified in the Table 1.3 are key players in the global marketplace. Annual sales in select global

industry sectors markets are shown in Tables 1.2 and 1.3. Table 1.4 shows annual sales in individual countries for select categories. Table 1.5 lists annual unit sales for select product categories in various countries and world regions.

Table 1.3 How big is the market II? Industrial Products and services

Product or Service	Size of Market	Key Players and Brands
Container shipping	\$ 150 billion	Maersk (Denmark); Evergreen Marine (Taiwan)
Construction equipment	\$ 90 billion	Caterpillar (USA); Komatsu (Japan); Volvo (Sweden)
LCD display screens	\$ 70 billion	Sharp (Japan); Samsung & LG Display (South Korea)
Service outsourcing	\$ 47 billion	Tata Consultancy Services (India); Infosys Technologies (India); Wipro (India); Tech Mahindra (India)
Crop seeds	\$ 30 billion	Monsanto (USA); DuPont (USA)
DRAM chips	\$ 26 billion	Samsung (South Korea); Infineon Technologies AG (Germany); Hynix semiconductors (South Korea)
CRM services	\$ 6 billion	Oracle (USA); SAP (Germany)
Regional jet aircraft	\$ 5.9 billion	Bombardier (Canada); Embraer (Brazil)

Source: Compiled by the author

Table 1.4 How big is the market III? Individual Country/Regional Markets

Country	Category	Annual Sales
United States	Online retail	\$ 172 billion
	White goods	\$ 22,4 billion
	Wood furniture	\$ 23 billion
	Video game controllers and games	\$ 10 billion
	Toothpaste	\$ 1.5 billion
	Ringtones	\$ 600 million
Japan	Pharmaceutical	\$ 50 billion
	Luxury goods	\$ 10.5 billion
India	Total retail	\$ 370 billion
	Soft drinks	\$ 2.3 billion
	Chocolate	\$ 157 billion
Europe	Online retail	\$ 47 billion
	Cigarettes	\$ 18 billion
	Home appliance (wholesales)	\$ 25 billion
China	Consumer electronics	\$ 85 billion
	Home appliances	\$ 38 billion
	Cosmetics and toiletries	\$ 10.3 billion
	Auto parts	\$ 19 billion
	Pharmaceuticals	\$ 11.7 billion

Source: Compiled by the author

Table 1.5 How big is the market IV? Country/Regional/World Markets by Product Category and Total Annual Units Sold

Country/Region	Category	Annual Sales
Japan	Cell phone handsets	50 million
United States	Cars and light trucks	13 million vehicles
India	Cells phone subscribers	270 million
Latin America	Automobiles	4 million vehicles
European Union	Shoes	2.5 billion pairs
Worldwide	Fiat-panel TV sets	50 million units
Worldwide	Cigarettes	5.2 trillion cigarettes
Worldwide	Cell phone handsets	1.2 billion handsets
Worldwide	HDTV sets	200 million units
Worldwide	Cars and light trucks	70 million vehicles

Source: Compiled by the author

3 MANAGEMENT ORIENTATIONS

The form and substance of a company's response to global market opportunities depend greatly on management's assumptions or beliefs—both conscious and unconscious—about the nature of the world. The world view of a company's personnel can be described as ethnocentric, polycentric, and geocentric. (Adopted from (Perlmutter, 2001)) Management at a company with a prevailing ethnocentric orientation may consciously make a decision to move in the direction of geocentricism. The orientations are collectively known as the EPRG framework.

3.1 Ethnocentric orientation

A person who assumes that his or her home country is superior to the rest of the world is said to have an ethnocentric orientation. Ethnocentrism is sometimes associated with attitudes of national arrogance or assumptions of national superiority; it can also manifest itself as indifference to marketing opportunities outside the home country. Company personnel with an ethnocentric orientation see only similarities in markets, and *assume* that products and practices that succeed in the home country will be successful anywhere. At some companies, the ethnocentric orientation means that opportunities outside the home country are largely ignored. Such companies are sometimes called *domestic companies*. Ethnocentric companies that conduct

business outside the home country can be described as *international companies*; they adhere to the notion that the products that succeed in the home country are superior. This point of view leads to standardized or extension approach to marketing based on the premise that products can be sold everywhere without adaptation.

As the following examples illustrate, an ethnocentric orientation can take a variety of forms:

- Nissan's earliest exports were cars and trucks that had been designed for mild Japanese winters; the vehicles were difficult to start in many parts of the United States during the cold winter months. In northern Japan, many car owners would put blankets over the hoods of their cars. Nissan's assumption was that Americans would do the same thing. As a Nissan spokesman said: "We tried for a long time to design cars in Japan and shove them down the American consumer's throat. That didn't very well. (Shirouzu, 2001)
- Until the 1980s, Eli Lilly and Company operated as an ethnocentric company: Activity outside the United States was tightly controlled by headquarters and the focus was on selling products originally developed for U.S. market. (Malnight, 1995)
- For many years, executives at California's Robert Mondavi Corporation operated the

company as an ethnocentric international entity. As Former CEO Michael Mondavi explained, "Robert Mondavi was a local winery that thought locally, grew locally, produced locally and sold globally.....To be a truly global company, I believe it's imperative to grow and produce great wines in the world in the best wine-growing regions of the world, regardless of the country or the borders." (Mondavi & Chutkow, 1998)

- The cell phone divisions of Toshiba, Sharp, and other Japanese companies prospered by focusing on the domestic market. When handset sales in Japan slowed few years ago, the Japanese companies realized that Nokia, Motorola, and Samsung already dominated key world markets. Atsutosi Nishida, president of Toshiba, noted, "We were thinking only about Japan. We really missed chance." (Fackler, 2005)

In the ethnocentric international company, foreign operations or markets are typically viewed as being secondary or subordinate to domestic ones. (We are using the term *domestic* to mean the country in which a company is headquartered). An ethnocentric company operates under the assumption that "tried and true" headquarters knowledge and organizational capabilities can be applied in other parts of the world. Although this can sometimes work to a company's advantage, valuable managerial knowledge and experience in local markets may go unnoticed. Even if customer needs or wants differ from those in the home country, those differences are ignored at headquarters.

Six years ago, most business enterprises – and especially those located in a large country like the United States – could operate quite successfully with an ethnocentric orientation. Today, however, ethnocentrism is one of the major internal weaknesses that must be overcome if a company is to transform itself into an effective global competitor.

3.2 Polycentric Orientation

The polycentric orientation is the opposite of ethnocentrism. The term *polycentric* describes management's belief or assumption that each country in which a company does business is unique. His assumption lays the groundwork for

each subsidiary to develop its own unique business and marketing strategies in order to succeed; the term *multinational company* is often used to describe such a structure. This point of view leads to a localized or adaptation approach that assumes products must be adapted in response to different market conditions. Examples of companies with a polycentric orientation include the following:

- Until the mid-1990s, Citicorp operated on a polycentric basis. James Bailey, a former Citicorp executive, explains: "We were like a medieval state. There was the king and his court and they were in charge, right? No. There were the land barons who were in charge. The king and his court might declare this or that, but the land barons went and did their thing." (Hansell, 1994) Realizing that the financial services industry was globalizing, then-CEO John Reed attempted to achieve a higher degree of integration between Citicorp's operating units.
- Unilever, the Anglo-Dutch consumer-products company, once exhibited a polycentric orientation. For example, its Rexona deodorant brand had 30 different package designs and 48 different formulations. Advertising was also executed on a local basis. Top management has spent the last decade changing Unilever's strategic orientation by implementing a reorganization plan that centralizes authority and reduces the power of local country managers. (Ball, 2005)

3.3 Regiocentric Orientation

In a company with a regiocentric orientation, a region becomes the relevant geographic unit; management's goal is to develop an integrated regional strategy. What does "regional" mean in this context? A U.S. company that focuses on the countries included in the North American Free Trade Agreement (NAFTA) – namely, the United States, Canada, and Mexico – has a regiocentric orientation. Similarly, a European company that focuses its attention on Europe is regiocentric. "What unites us through our brands, markets, and business is the group's identity, which we refer to as 'a worldwide business with local presence'. Everywhere we operate, our priority is

to create or develop a strong brand that reflects consumer needs in that market as closely as possible.” (Riboud, 2003) Some companies serve markets throughout the world, but do so on a regional basis. Such a company could be viewed as a variant of the multinational model discussed previously. For decades, a regiocentric orientation prevailed at General Motors: Executives in different parts of the world – Asia – Pacific and Europe, for example – were given considerable autonomy when designing vehicles for their respective regions. Company engineers in Australia, for example, developed models for sale in the local market. One result of this approach: A total of 270 different types of radios were being installed in GM vehicles around the world. As GM Vice Chairman Robert Lutz told an interviewer in 2004, “GM’s global product plan used to be four regional plans stapled together.” (Hawkins, 2004)

3.4 Geocentric Orientation

A company with a geocentric orientation views the entire world as a potential market and strives to develop integrated strategies. A company whose management has adopted a geocentric orientation is sometimes known as a *global transnational company*.¹ During the past several years, longstanding regiocentric policies at GM such as those previously discussed have been

replaced by a geocentric approach. Among other changes, the new policy calls for engineering jobs to be assigned on a worldwide basis: a global council based in Detroit determines the allocation of the company’s \$ 7 billion annual product development budget. One goal of the geocentric approach: Save 40 percent in radio costs using a total of 50 different radios.

It is a positive sign that, at many companies, management realizes the need to adopt a geocentric orientation. However, the transition to new structures and organizational forms can take time to bear fruit. As new global competitors emerge on the scene, management at long-established industry giants, such as GM, must face up to the challenge of organizational transformation. A decade ago, Louis R. Hughes, a GM executive, said, “We are on our way to becoming a transnational corporation.” Basil Drossos, former president of GM de Argentina, echoed his colleague’s words, noting, “We are talking about becoming global corporations as opposed to a multinational company; that implies that the centers of expertise may reside anywhere they best reside.” (Blumenstein, 1997) For the moment, GM is still the world’s number one automaker in terms of revenue. Table 1.6 compares the two companies just prior to the onset of the global economic crisis; even then, Toyota surpassed GM in terms of profitability and market value. In 2008, Toyota sold more vehicles worldwide than GM. As GM teetered on the brink of bankruptcy in 2009, it was clear that it would have to be remade as a smaller, leaner company.

A global company can be further described as one that pursues either a strategy of serving world markets from a single country, or one that sources globally for the purposes of focusing on select country markets. In addition, global companies tend to retain their association with a particular headquarters country. Harley-Davidson and Waterford serve world markets from the United States and Ireland, respectively. By contrast, Gap sources its apparel from low-wage countries in all parts of the world; a sophisticated supply chain ensures timely delivery to its network of stores. Although Gap is a global brand, it focuses on the key U.S. market. Harley-Davidson, Waterford, and Gap all may be thought of as global companies.

¹ Although the definitions provided here are important, to avoid confusion we will use the term *global marketing* when describing the general activities of global companies. Another note of caution is in order: Usage of the terms *international*, *multinational*, and *global* varies widely. Alert readers of the business press are likely to recognize inconsistencies; usage does not always reflect the definitions provided here. In particular, companies that are (in the view of the authors as well as numerous other academics) global are often described as multinational enterprises (abbreviated MNE) or multinational corporations (abbreviated MNC). The United Nations prefers the term transnational company rather than global company. When we refer to an “international company” or a “multinational”, we will do so in a way that maintains the distinctions described in the text.

Transnational companies both serve global markets and utilize global supply chains; in addition, there is often a blurring of national identity. A true transnational would be characterized as “stateless”. Toyota and Honda are two examples of companies that exhibit key characteristics of transnationality (see exhibit 1.4). At global and transnational companies, management uses a combination of standardized (extension) and localized (adaption) elements in the marketing program. A key factor that distinguishes global and transnational companies from international or multinational companies is *mind-set*. At global and transnational companies, decisions regarding extension and adaption are not based on assumptions. Rather, such decisions are made on the basis of ongoing research into market needs and wants.

“These days everyone in the Midwest is begging Honda to come into their hometown. It is no longer viewed as a “Japanese” company, but a “pro-American-worker corporation” flushes with jobs, jobs.” (Brinkley, 2006)

One way to access a company’s “degree of transnationality” is to compute an average of three figures: sales outside the home country to

total sales; assets outside the home country to total assets; and employees outside the home country to total employees. Viewed in terms of these metrics, Nestle, Unilever, Royal Philips Electronics, GlaxoSmithKline, and the News Corporation are all transnational companies. Each is headquartered in a relatively small home country market, a fact of life that has compelled management to adopt regiocentric or geocentric orientations to achieve revenue and profit growth.

The geocentric orientation represents a synthesis of ethnocentrism and polycentrism; it is a “world view” that sees similarities and differences in markets and countries and seeks to create a global strategy that is fully responsive to local needs and wants. A regiocentric manager might be said to have a world view on a regional scale; the world outside the region of interest will be viewed with an ethnocentric or a polycentric orientation, or a combination of the two. However, recent research suggests that many companies are seeking to strengthen their regional competitiveness rather than moving directly to develop global responses to changes in the competitive environment. (Morison, Ricks, & Roth, 1991)

Table 1.6 GM and Toyota Compared

	General Motors	Toyota
Revenue	\$ 205 billion	\$ 185 billion
Profit or – Loss	- \$ 11.3 billion	\$ 12.6 billion
Market value	+\$ 17.5 billion	\$ 197 billion
Worldwide car production	9.2 million	8.3 million
Percentage of the worldwide workforce in the US	45	11
Percentage of the US light-vehicle sales	24.8	15

The ethnocentric company is centralized in its marketing management, the polycentric company is decentralized, and the regiocentric and geocentric companies are integrated on a regional and global scale, respectively. A crucial difference between the orientations is the underlying assumption for each. The ethnocentric orientation is based on a belief in home-country superiority. The underlying assumption of the polycentric approach is that there are so many differences in cultural, economic, and marketing conditions in the world that is futile to attempt to

transfer experience across national boundaries. A key challenge facing organizational leaders today is managing a company’s evolution beyond an ethnocentric, polycentric, or regiocentric orientation to a geocentric one. As noted in one highly regarded book on global business, “the multinational solution encounters problems by ignoring a number of organizational impediments to the implementation of a global strategy and underestimating the impact of global competition”. (Yoshino & Rangan, 1995)

4 CONCLUSIONS

Marketing is an organizational function and a set of processes for creating, communicating, and delivering value and for managing consumer relationships in ways that benefit the organization and its stakeholders. A company that engages in global marketing focuses its resources on global market opportunities and threats. Successful global marketers such as Nestle, Coca-Cola, and Honda use familiar marketing mix elements – the four Ps – to create global marketing programs. Marketing, R&D, manufacturing, and other activities comprise a firm's value chain; firms configure these activities to create superior value on a global basis. The value equation (V-B/P) expresses the relationship between value and the marketing mix.

Global companies also maintain strategic focus while relentlessly pursuing competitive advantage. The marketing mix, value chain,

competitive advantage, and focus are universal in their applicability, irrespective of whether a company does business only in the home country or has a presence in many markets around the world. However, in a global industry, companies that fail to pursue global opportunities risk being pushed aside by stronger global competitors.

A firm's global marketing strategy (GMS) can enhance its worldwide performance. The GMS addresses several issues. First is the nature of the marketing program in terms of the balance between a standardized (extension) approach to the marketing mix and a localized (adaptation) approach that is responsive to country or regional differences. Second is the concentration of marketing activities in a few countries or the dispersal of such activities across many countries. Companies that engage in global marketing can also engage in coordination of marketing activities. Finally, a firm's GMS addresses the issue of global market participation.

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RELATIONSHIP MARKETING AS AN EFFECTIVE STRATEGY GUIDELINES AND A GUARANTEE OF SUCCESS IN THE BUSINESS OF A MODERN COMPANY

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Abstract:

Starting from the limited management and marketing mix as a dominant previous practice, the emergence of relationship marketing presents distinctive paradigm of marketing evolution, moving towards development of integrated relationship management, with more or less well-known customers. Relationship marketing actually comprises all the marketing activities that are directed towards the establishment, development and maintenance of successful relations of trade. Indeed, traditional concept of marketing (4P + 3P) is becoming less efficient with new conditions of global economy and new competition conditions of cross-linked economy and markets. Therefore, the new concept of relationship marketing between companies, their customers and other stakeholders that are important for the overall marketing efficiency was born. That is a new approach not only to marketing, but also to management generally. Relationship marketing can be considered as an effective strategy leading company in the new millennium. There are two key innovations. The first one only touches the new approach to management and marketing, while the second one significantly goes into the detail about the organizational innovation and new structure of company, which is now not limited only to the marketing function, but affects all the other functions in the company.

Relationship marketing presents the activity of harmonization of business strategies, organizational structure and company culture, information about clients and information technologies, with the objective of continuous satisfaction of client's needs and achievement of business benefits and profits. The new marketing concept is concentrated on understanding of customers in all aspects. Here marketing focus moves from classical instruments and business orientation to customer orientation, value and service dimension, with strong backbone in long term customer relationships. The cycle of the marketing value of products and customers is reflected in the fact that the product value drops over time, while the customer value grows over time.

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marketing, long term customer relations, marketing concept, modern marketing approach



1. INTRODUCTION

At the end of the 20th century, a series of new marketing concepts arises giving a new long-term dimension to the role and importance of consumers, and their interests are not only the loyalty of consumers but having long-term relations of cooperation and partnership with the key customers and consumers, with significant form of personalization of these relations.

Strong correlation between satisfaction, loyalty and profitability has been proven in practice. Main prerequisite to loyalty of consumers is satisfaction. Namely, despite great achievements that are related to the study of consumers, they still haven't, at least not completely, answered the question why consumers behave the way they do in the purchase and consumption of products and services. Scientists of different profiles find human brain mostly incomprehensible. Consumer behaviour as a discipline, aimed at broader range of issues related to the development and characteristics of man as a consumer is not concerned with defining strategies of establishing and maintaining relationships with customers.

These new trends in marketing have a completely new approach to relations with customers and other key stakeholders in the business. Their creation is a result of new information and understanding and so convergence of science and practical problems in the economy and society. Development of technology also had significant role, especially IT, which was a major precondition for the development of these concepts.

Modern tendencies of development of IT technologies besides marketing possibilities bring business innovations in way of communication with customers. These technologies do not concern only services and products offered to customers, but also the ways and communication techniques to them. In that sense, different tools called web 2.0 are used. The main idea of web 2.0 technology refers to the shift from classical web pages as relatively isolated information storages to computer platform with an architecture open to active user involvement. This technology provides additional features, such as: openness and freedom of users' participation (possibility both for upload and

download), dynamic content, scalability. By that, these technologies create possibility of not only listening customers' opinions, but also of making customers cooperate with each other, as well as with the company. Nowadays, there are many wonderful examples of companies using the appropriate web 2.0 tools. By that companies have succeeded in attracting many customers to comment, give suggestions, vote about products etc.

Recently, there has been developed a number of concepts that essentially more or less differ, but they all focus on developing long-term relations with customers as: Relationship marketing (marketing of relations), database marketing (marketing supported by databases), Customer Relationship marketing CRM (customer relationship management). In addition to the above mentioned, one can find the following expressions in the literature: Retention marketing, Interdependent Marketing, Loyalty Marketing, 1:1 (one-to-one), Partnership Marketing, Marketing with Permission, Frequency Marketing, Real-Time Marketing.

The most prevalent direction of analysing the development of long-term relationships with customers and other partners, is relationship – marketing. There is no generally accepted definition of this term. Usually, Gronroos's definition is taken as most complete, and it states the following: "Relationship marketing represents establishment, development and maintenance (and break if needed) of relationships with customers and other stakeholders, with gaining profits, and in the way that enables reaching the goals of all parties, which is achieved by common sharing and fulfilling of expectations." (Source: Michael John Harker, Relationship defined, Marketing Intelligence and Planning, 17/1, 1999, p. 13-20).

2. THE ESSENCE OF RELATIONSHIP MARKETING IN COMPARISON TO THE TRADITIONAL MARKETING

The essence of the relationship marketing stands in making difference to the classical transactional marketing. That difference can be made on several grounds, as shown in the comparative review (Table 1).

Table 1. *Transactional vs. Relationship marketing*

TRANSACTIONAL MARKETING	RELATIONSHIP MARKETING
Focus on transaction and single sale	Focus on orientation towards customers and partnership
Company as a limit	No limits
Independence	Dependence guided by established network
Value for customer	Value for partnership
Competition	Cooperation
Passive customers	Active customers
Strong impression in the sales process is basis	Basis in sale and in gaining trust
Orientation on product characteristics	Orientation on benefits from product
Focus on services related to the product	Focus on the expectations and perception of people
"Pushing" prices	Promoting value
Searching for new customers	Keeping current customers
Short-term thinking and actions	Long-term thinking and actions
Building business on bargaining	Building business on relationships
Small market on client's service	Large market on client's service
Post-sales services as an additional expense	Post-sales services as an investment in relationships
Limited commitments to customers	Large commitments to customers
Moderately intensive contact with the customer	Highly intensive contact with the customer
Quality is important for production	Quality is important for everyone
Mass communication	Personal communication
Isolated market research	Improved dialog with customer
Mass markets or market segments	Markets narrowed to an individual
Market participation	Participation in consciousness (participation at buyers' etc.)
No structure for further business	Creating structure for supporting relationships
Awarding system for job performance	Awarding system for maintenance and development of relationships and revenues
Finished work is the end	Sales are only the start

There are many sources that define the differences between traditional and relationship marketing, which do not differ importantly in their fundamental elements. This comparative review was prepared by combining several sources.

The time dimension is one of the key differences between transactional marketing and relationship marketing. Relations cannot be built in a short period of time. Key determinants of marketing relationships: trust, promise, obligation, community and long-term common interests.

Intense changes in the environment of developed market economies that are getting more and more intensive encourage changes in transformation of traditional approach to management and marketing theory and practice. Changes in business mostly affect the changes in marketing, rigid and overly segregation between physical products and services is lost. In order to achieve a high degree of flexibility and innovation in product development and overall marketing, companies are forced to establish strong relationships with their customers, which caused the emergence of a new paradigm of marketing based on even stronger relationships with customers and other stakeholders. Market relations fully reflect all events in business and overall social environment.

Relationship marketing is used in all economic fields, and it is gaining more importance in the consumer goods and services. It is usually analysed on three basic levels:

- Tactical level (similar to the activities of sales promotion);
- Strategic level (emphasis on development of partner relations with customers);
- Philosophical level (it reflects the essence of the philosophy of marketing – the whole organization is focused on delivering total satisfaction to customers and maintenance and development of their business) Source: Veljkovic S, page 174.

It may be concluded, in general, that there has been a change in the overall logic of consideration at companies from different sectors of the economy. Modern age requires companies from various industries to behave in a way so that they fully respect their partners and develop long-term relationships with their major customers, which is the highest stage in the evolutionary development of business logic.

3. BUILDING LONG-TERM RELATIONS

Correlation between satisfaction, loyalty, and profitability of customers has been empirically proven. (Source: International Journal of Service Industry Management, Vol.7 No. 4, 1996, p.27-42).

Satisfaction is the main prerequisite for consumer loyalty, but not the only one. One should, in this context, look for a deeper approach, which involves the intensity of satisfaction and the intensity (positive or negative) of the reaction of consumers to company's offer. For example, if you have two competing companies which came to same results of measuring satisfaction that 85% of consumers are satisfied with the products or services of the company, it is quite different position than of the company which has 55% extremely satisfied, 20% very satisfied and 10% satisfied, from another company in which the ratio is 10% extremely satisfied, 25 % very satisfied and 50% satisfied. The experience shows that it is 42% more likely that the loyal consumer will be the one who is "extremely satisfied" than that one who stated to be "satisfied". Consumer may be satisfied with a product/service until such time as he/she sees a brand that better meets his/her needs and expectations. Satisfaction may decrease in time, either because of the higher expectations or for the reasons of lower performances.

Extremely loyal and enthusiastic consumer is not only satisfied, but this is the person that buys the products and services of the company and expands positive oral propaganda and obtains new customers for the company.

Trust and commitment have major role in forming of loyalty of consumer to the brand and company.

We conclude that the loyal consumer is a precondition to a successful business.

The question is how to define loyalty. There are two approaches. One starts with consumer attitudes, that is their preferences, based primarily on satisfaction they had in the previous shopping. Alternative approach is behavioural approach, based on the actual situation and the actual purchase. This type of measuring satisfaction, having in mind the modern scanning systems and other types of sales that can

accurately determine the buying behaviour became more appealing to managers. Applying the two known methods of measurement, all consumers can be divided into four categories, depending on the degree of loyalty measured by purchases/visits to service companies:

- Absolute loyalty;
- Unsteady loyalty;
- Relative loyalty;
- Disloyalty.

Consideration of this matter is much more subtle, because loyalty of customers is different at particular segments of the market. This approach does not answer the question why a consumer buys certain brand. That is why one-dimensional observation of loyalty cannot give complete and accurate answers. Consumer's attitudes and preferences to some service companies must be monitored, as well as their real buying behaviour. It provides a framework that defines loyalty as the favoured attitude towards a particular brand, which results in constant purchases over time. (Source: Asael Henry, 1992).

It is possible to identify four types of loyalty, depending on the frequency of re-buying and intensity of attitudes towards a particular brand, such as: false loyalty, latent loyalty, stable loyalty, no loyalty. There are common cases and situations where loyalty does not exist. Customer simply does not see the difference between alternatives and does not prefer any of them, and the purchase is done mostly on a random choice. In practice, it is often assumed that profit is a measure of the importance of customers. The results show that each form of loyalty is not profitable for the company, i.e. a good part of the loyal customers is not profitable, and therefore there is a need for a strategic approach to loyalty. According to this principle, one should take into account not only profitability, but also estimation of the relationship between profitability and long term cooperation with some clients.

For the company to recognize the true benefits, it must accept the concept of value, which means that profitability is essential, but there are other benefits that can indirectly affect the business results of the company, but also the loyalty of the employees, competitive companies, etc.

4. STRATEGY OF DEVELOPING LONG-TERM RELATIONSHIP WITH CONSUMERS

Basis for the development of long-term relationship is strategic focus. The main goal is to, by delivering a quality product/service (by the standards set up by consumers), influence the long-term satisfaction of consumers, which is a prerequisite for full loyalty. When a company has motivated and satisfied employees, from the first line of serving to the managerial position, with the corporate culture, success is guaranteed. Loyalty of RELATIONSHIP to business practice is placed in a square: Satisfaction of consumers – quality of product/service – customers' loyalty and increased profit - satisfaction and loyalty of employees.

The basic elements of the long-term relationship derive from elements necessary for the proper functioning of marketing. Therefore we can say these elements are the following:

- Knowledge of consumers' needs and desires, characteristics, and effects of some factors on their behaviour;
- Real marketing i.e. marketing way of thinking;
- Achievement of modern concepts that address the development of long-term relationships with customers;
- Options and needs of companies;
- Understanding the role and importance of all those involved in the process of creating and delivery of products/services (value);
- Long-term way of thinking and behaviour; and
- Company working as a whole.

The very process of long-term relationships can be separated into the following steps:

- Interaction with consumers;
- Recognition (personification) of consumers - treating each customer as an individual through personal contact or automated process;
- Creating a loyalty program - rewards and added value;
- Continuous improvement of concepts (control, measurement and feedback of information);
- Corrective actions - management of consumer dissatisfaction.

By creating a dialogue with customers one can come up with valuable information, which is converted into knowledge, and knowledge is the basis for the adjustment of supply and taking

action on establishing long term relationships. Further, efficient and effective action leads to satisfaction of consumer, creating confidence and familiarity. Satisfaction, trust and commitment lead consumers to loyalty and loyalty leads to profit. Profitability of the company and satisfaction of consumers is initiated and supported by interaction with consumers (Source: 34 Nova Trgovina, year 54, no. 9-10.2001, p. 53-60).

Personalization and customization are different in the fact that the personalization often involves automatic adjustment until the adjustment is done automatically, but at the request of user. It usually refers to adjustment of: products, services, price and payment terms, distribution channels and adjustment of communications.

5. CREATION OF SENSE OF CONFIDENCE – AN EXAMPLE OF BANKING SECTOR

Priority of the management for customer relations (Customer Relationship Management-CRM) is creation of loyal customers. The key to creation of loyal customers is in creation of sense of confidence. Certain number of authors in the field of management (Rousseau, Sitkin, Cramerer, 1988) developed the model of confidence. This model has been successfully applied in corporate banking (Saparito, Chen, Sapinzena, 2004) and is applicable to other areas.

The next model makes the distinction between three modes of trust: calculated trust (calculus based trust), trust based on relations (relational trust) and trust based on identification (identification based trust).

Calculated trust is the basic form of establishing a relationship between the users of a company. The cooperation with the company is reduced to the exchange without creating social and emotional basis of relations. Calculated trust is established on the principle of mutual interest.

The key to achieving successful relationship of transactional trust is consistent behaviour. Fulfilling given promises motivates users to continue the cooperation with the company. The largest number of users base their relations with the company just on the feeling of calculated trust.

Developing a sense of mutual trust culminates by establishing feelings of trust based on identification. It is no longer enough to show a consistent behaviour and fulfil the promises. The trust based on identification is characterized by the existence of common goals, respect of the same system of values, and mutual ability to predict the reactions of the other party (Pearson, 2006).

Only a small number of users develop a sense of confidence based on the identification with the corporation. They are willing to continue to cooperate with the company even in the case they suffer discomfort, i.e. develop a sense of loyalty.

Establishing a relationship of relation trust or trust based on identification provides the following advantages (Saparito et al, 2004):

- Likelihood to switch users to a firm that offers more favourable conditions is smaller. Users are making no effort to finding companies that offer more favourable terms.
- Users are motivated to continue cooperation with the company, although suffering embarrassment, because they cannot easily transfer relations that are created to another company.
- Relational trust and trust through identification leads to the creation of loyal customers.

Intangible assets are among the most important sources of competitive advantage in the banking industry, for example. In order for it to be a source of competitive advantage, intangible property must offer (a) a unique value that is (b) relevant to users. Then, intangible assets enrich the offer because it points to the uniqueness of the company in comparison to the competition.

Marketing has a key role in the creation of elements of intangible assets as: corporate reputation (corporate reputation), the corporate ethos (corporate values), the intangible value of the brand (brand equity) and so on.

Example: Merging of Bank Intesa and Sanpaolo IMI Group, first one from Milan and the other one from Turin. Merging entered into force in January 2007 by which the Intesa Sanpaolo Group emerged as the largest banking group in Italy and the third one in Europe on the basis of total assets.

This merging represented a consolidation of several marketing challenges: (a) positioning the brand Intesa Sanpaolo in the same way in a larger number of markets, and (b) the creation of a common vision and corporate culture, which will be able to create a sense of belonging and commitment to the new group (Intesa Sanpaolo, 2008, October).

Positioning of brand Intesa Sanpaolo Group and the creation of a common vision and a corporate culture is based on corporate system of value as one of the most important elements of intangible assets. This system takes central position in all internal and external communications and makes a basis of all marketing activities.

In order to define the corporate value system, qualitative research by method of brainstorming was conducted with representatives of all local banks.

Brainstorming defined key insights of the users at the local level, after which they were crossed with the profile of brand Intesa Sanpaolo, which "leads to large values that transcend borders and unite people; they are close to people from all countries and at the same time belong to the group" (Intesa Sanpaolo, 2008, October).

Corporate system of values of Intesa Sanpaolo Group communicates: imagination, humanity, stability and hope. For example, for the practical application of this system of value, one of several of these, is the slogan: We think ahead with you. (Source: Intesa Sanpaolo. (2008, October). How to define global identity: Case history of Intesa Sanpaolo subsidiary international banks).

6. MULTIDIMENSIONAL RELATIONSHIP MARKETING

Without neglecting the emotional effects, the company must come up with what consumer wants and expects, in what way consumers want a company to treat them as well as products close to them: In order to incorporate demands in the corresponding profile of the product or service, marketing companies must understand the demands of consumers. Using and achieving mutual lasting business relationships with individual customers is priority and the pledge of successful business. That is why it can be argued that the value of the product declines over time, and customer value grows over time, in which the

consumer life cycle (CLC) is of utmost importance. CRM is a strategic framework for the rational marketing. CRM can be expressed as an umbrella that covers: Winning over → Taking over and expansion of the customer base → Retention.

CRM is a widely established approach that is primarily oriented to individual consumers and their individual demands. As company develops individual relationships with each of customers ETFS stage - Engage, Transact, Fulfil, Service – they imply that such a cycle refers to the stages through which a consumer passes with each purchase, and that such a cycle is repeated over again (their relationship is made up of a series of such cycles). Concept of customers' lifecycle is usually used by companies for CBM activities which include modelling of consumer behaviour (Customer behaviour modelling). Nowadays it is widely accepted the understanding that among the main indicators of modern marketing metrics are: 1) the total number of consumers, 2) revenue per customer, 3) customer satisfaction, 4) customer retention rate, 5) an increase in sales and 6) the cost of acquiring customers, 7) cost of sales, 8) costs of servicing customers and 9) the cost of retaining customers.

Therefore, there are two groups of specific indicators – one on the revenue and the other on the cost side – overlapping to certain extent with the information offered by traditionalists.

Experience shows that majority of companies is focused on the first five categories, while less to the others. CRM indicators are in direct connection with the profitability of consumers and the greatest attention should be given to them.

CONCLUSIONS

Customer relationship management represents the activity of complying business strategies, organization structure and culture of the company, information on customers and IT with the aim in continuous satisfaction of customers' needs and, at the same time, gaining business benefit and profit. Stages of implementation of the strategy are as follows: operational

management that implies automation and optimization of sale – so called operational CRM, automation of marketing, measurement of marketing performance, monitoring contacts with customers, as well as automation of support to the users through call centres.

Segmentation represents the second stage of implementation of CRM which principles imply creation of the market map, where target segments may be distinguished according to the similar behaviour of customers.

The principle of targeting directs marketing towards efficient allocation of business resources. The principle implies adequate determination of the target group for certain package of the offer.

This is followed by the model of trust: calculated trust, relational trust, development of mutual trust that achieves its maximum by establishment of trust based on identification.

Today, competitive advantage may be provided only by user-oriented strategies (Customer-centric), which means that companies build their positions based on how well they serve their customers. The user-oriented strategy is not the aim that may be achieved or proclaimed, but it is a "moving target" and constant orientation and manner in which the company must operate. This is enabled by CRM, which secret lies in the fact that it is different to every company, that does not exclude to possibility that it may be learned from the experience of others. There are three key reasons due to which CRM is getting increasingly more important: competition is growing day by day, it is more profitable to keep the existing customers than to obtain the new one, and technology that enables this has reached the satisfying level.

It is clear, today, that the CRM is a business philosophy and related strategy of advanced management of relations with customers according to the principle of respect of individual importance of every consumer and this is where it's true perspective for development of marketing in the future at the global level.

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THE ROLE OF THE STATE IN THE RENEWABLE ENERGY MARKET DEVELOPMENT IN UKRAINE

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Abstract:

Renewable energy development is one of the possible solutions to avoid dangerous climate changes and energy dependence. That is why many countries introduce a variety of incentives to attract investments in this sector. The aim of this article is to analyze impact of the Ukrainian state policy on the national renewable energy market. We questioned whether Ukrainians governmental interventions into this market have been successful. We also outline the influence of such incentives on the volume of investments, renewable energy capacity building, as well as on the competition at the market. The research has shown that Ukrainian government has implemented a number of tax and tariff incentives, which gave an impulse for rapid development of the sector. On the other hand, the rules for obtaining subsidies currently contain some risks for competition in the renewable energy sector. We came to the conclusion that despite some significant technical and administrative barriers, governmental incentives for renewable energy represent a rare case of successful subsidies in Ukraine.

Keywords: *renewable energy market, feed-in tariff, tax incentives, local content requirement*

1 INTRODUCTION

Renewable energy is developing fast in many countries in the world. This energy uses inexhaustible resources available at any country in the world. Meanwhile, almost no hazardous emissions to atmosphere arise from renewable energy producing facilities. Moreover, renewable energy could be characterized as energy of the future, as it is deeply linked to development of innovative technologies. That is why many governments support renewable energy development with different types of subsidies, to

achieve ambitious goals of gradual replacement of energy produced from traditional sources with energy produced from renewable sources.

Meanwhile, Ukrainian industry is still based on outdated technologies, what has made the national economy one of the most energy inefficient in the world. In Ukraine, the major part of electricity is produced at cogeneration plants which are primary using coal. This is one of the most environmentally unfriendly ways of electricity production. Moreover, currently Ukraine imports more than 50% of all energy resources required for satisfying its needs. Thus, renewable energy development is one of the possible solutions to deal with energy dependence and ecological issues. However, Ukraine's energy production from renewable sources currently is far below its potential.

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Successful good practice of different countries shows significant role of the state in the development of renewable energy sector. Twenty of 27 EU countries already use feed-in tariff as renewable energy support instrument. And in these countries the majority of newly installed wind onshore and photovoltaics capacity in Europe has come into operation (Ragwitz M., Winkler J., Klessmann C., Gephart M., Resch G., 2012).

This article represents an attempt for theoretical and empirical analysis of the governmental role in the renewable energy market development in Ukraine. It's intended to give an overview of state policy in this sector. The aim of the paper is to define whether governmental interventions were significant and sufficient for the sector development.

2 MARKET FAILURES OR THE REASONS, WHY GOVERNMENT SHOULD INTERVENE INTO RENEWABLE ENERGY MARKET

Economic theory provides different motivations for renewable energy stimulating policy. Gillingham K. and Sweeney J. describe 12 types of market failures existing at renewable energy market (Gillingham K., Sweeney J., 2010). Market failure is a situation where optimal choices deviate from economically efficient choices. Government interventions can eliminate existing market failures and in such way improve net social welfare.

Below we outline the most common market failures for Ukrainian renewable energy market.

Environmental externalities are the main motivation to support renewable energy. Traditional energy emits a variety of pollutants. These pollutants have a strong negative impact on the economy. They are harmful to the environment and public health. Due to the environmental contamination, the costs related to medical services, environmental protection and for cleansing the environment would increase for society. These external costs of the traditional energy sources usually are not priced until the government intervenes (for example, in the form of excise duty or environmental tax). If the emissions are not priced, there will be no incentive for businesses to introduce new

technologies or processes in order to reduce the emissions or mitigate the external costs resulting thereof. The main advantage of renewable energy is low level of emission. Thus, this type of energy is less costly for society even if the price is higher.

Ecological tax rate in Ukraine is lower than the rates applied in the EU countries (Shkarlet S., Petrakov I., 2013). Ukrainian excise duty for gasoline is one of the lowest in Europe as well. Thus renewable energy stimulation policy is the main tool to eliminate negative environmental externalities. Ukrainian government expects that renewable energy will gradually replace traditional energy sources in energy consumption structure and emissions would decrease.

National security externalities. Oil and gas production is highly concentrated in few countries, such as Middle East, Nigeria, Russia and so on. The main supplier of gas and oil to Ukraine is Russia. Therefore, there are high risks for Ukraine related to import of energy sources. Ukrainian dependency from Russian gas is very dangerous for national security. Series of gas disputes between Ukraine and Russia in 2005-2009 concerning natural gas supplies, prices, and debts have proved this. Thus, renewable energy promotion is a way to decrease imported natural gas consumption that is extremely important for national security.

Economies of scale, particularly increasing returns to scale, refers to a situation where average cost of producing a unit decreases as the rate of output at any given time increases, resulting from a non-convexity in the production function due to any number of reasons, including fixed costs (Gillingham K., Sweeney J., 2010). Economy of scale is a main reason of so called "feed-in tariff degression", a mechanism according to which the price (or tariff) ratchets down over time. Many countries introducing feed-in tariff expect that increase in the volume of renewable energy equipment production and technological progress will decrease renewable energy production costs. But at the initial stage where the volume of production is low, renewable energy sector needs support from the government to reach economy of scale.

R&D. Where businesses invest in R&D, they are usually not able to capture all of the knowledge gained from their investment. For example, successful R&D by a particular firm (e.g., R&D that created a new class of solar photovoltaic cells) would likely result in a portion of new knowledge being broadly shared, through trade magazines, reverse engineering by its competitors, or technical knowledge employees bring with them as they change employment among competitive firms (Gillingham K., Sweeney J., 2010). R&D provides a big gain for society as it has significant effect of technological progress, human capital development and economical growth. Thus the gain for society from particular R&D is sometimes bigger than for the firm that has actually carried it out. Empirical work suggests that additional R&D investment in renewable energy will at least partly displace R&D in other sectors (Gillingham K., Sweeney J., 2010). That is why the state is interested in stimulation of R&D investments. However, as the level of R&D subsidies in Ukraine are very low (not only for renewable energy sector, but for other sectors too) this argument is rather theoretical.

3 DEMAND AND SUPPLY FOR RENEWABLE ENERGY IN UKRAINE

Ukrainian economy still remains one of the most energy-consuming in the European region. According to the International Energy Association, the ratio of energy consumption to GDP is ten times more than the average ratio in OECD countries. Thus, there is a strong demand for energy while the energy consumption is very high (IEA, 2012). The main sources of energy production in Ukraine are as follows: natural gas 40%, coal – 31% and nuclear power – 17%. Meanwhile, the share of renewable energy in 2011 was only 0,5%. Despite the strong demand for energy from the industry producers, they actually consume energy mainly from other sources (substitute goods) such as oil and gas.

There are many constraints in the supply development of renewable energy in Ukraine:

- The production costs of renewable energy are higher than from traditional sources;
- There are a lot of technical issues for building renewable energy capacities on Ukraine:

difficulties with connection of generating facilities to the general electricity grid; burdensome procedures for obtaining various type of permits and renting the land for building renewable energy facilities etc;

- High level of interest rates for bank loans.

Nevertheless, Ukraine holds a significant potential for renewable energy development, especially nature potential. Ernst & Young estimates that Ukraine has 2.3 GW of small-scale hydroelectric potential, compared to its current installed capacity of 150 MWh. Wind power potential is estimated to be 19-24 GW with only 87MW installed at the end of 2009. Ukraine also has strong solar energy potential, with irradiation of around 800-1450kWh/m² per year, but the current installed capacity was negligible at the end of 2010 (Ernst&Young, 2013). Furthermore, Ukraine's renewable energy sector currently produces power at a much lower cost than in the other countries. For instance, producing of 1 MWh of wind energy in Ukraine costs approximately 33 USD, compared with 145 USD in Czech Republic and 50 USD in China (OECD, 2012).

Thus Ukrainian supply and demand model of renewable energy sector without government intervention looked like in such way, that the quantity of energy proposed from suppliers was not enough to meet the market potential. The sector stagnated and had almost no development. The main reason for this was considerable market barriers envisaged above and other specifics of doing business in Ukraine (e.g., high level of corruption).

4 GOVERNMENT INTERVENTIONS

4.1 Feed-in tariff

In 2008 in Ukraine has introduced a price floor for the energy from renewable sources (implemented by means of feed-in-tariff). According to Ukrainian legislation, the Wholesale electricity market (being a fully state-owned company) has to purchase all the energy produced from renewable sources for the price equal the level of feed-in-tariff. This price floor did not result in decrease of quantity demanded on the market as the Wholesale electricity market, energy-distributing companies and consumers

are anyway obliged to buy this energy at the level of feed-in-tariff, even if this price is not economically substantiated.

Naturally, green electricity turns out to be more expensive, so there is no economic point for final consumers in purchasing it. Yet, there is no mechanism for cost-cutting in order to make green electricity cheaper for end-use consumers. Thus, the only actual buyer of green electricity is the Wholesale electricity market (Trypolska, 2012). Actually the main influence of feed-in tariff on the market is increasing costs of Wholesale electricity market for purchasing such electricity from producers.

The level of feed-in tariff in Ukraine is high enough to compensate the the production costs to the energy generating facilities. According to Trypolska research, the average costs of electricity production from biomass is 0,057 euro/kWh, but the current level of feed-in-tariff is 0,127 euro/kWh for solar energy average cost are 0,112 euro/kWh and feed-in tariff level – 0,143 euro/kWh, for wind energy average costs are 0,027 euro/kWh and feed-in tariff 0,066 euro/kWh (Trypolska, 2012).

Table 1. The level of procurement prices for electricity produced from different types of energy sources on November 2013 (Wholesale electricity market of Ukraine, 2013)

Type of energy source	Procurement price hryvna/kWh,	Price equivalent in euro* (euro/kWh)
Nuclear energy	0,22	0,02
heat power plant	0,58	0,05
Hydro	0,22	0,02
Small hydro	1,28	0,12
Wind power	1,25	0,12
Solar energy	5,05	0,47

*At the exchange rate for 19th November 2013

As for November 2013, the level of feed-in tariff for solar energy was about 50 euro cents/kWh (the actual level of tariff is established in hryvna, hence the price in euro depends on the exchange rate), what is the highest in Europe and more than twice as in Germany in 2012 (Zhang, 2013). The main source of compensation for such high level of feed-in tariff is the low level of prices for

energy produces from the other energy sources. Table 1 shows procurement prices of Ukrainian Wholesale electricity market for electricity produced from different types of energy sources. National Electricity Regulatory Commission of Ukraine (a governmental authority) establishes all the tariffs for electricity produced from all the types of the energy sources in Ukraine. The energy produced from nuclear and hydro energy is “the cheapest”. As there is no competitive energy market in Ukraine, high difference in regulated tariffs results in a situation where nuclear and hydro energy producers actually subsidize the high level of feed-in tariffs in Ukraine.

On the other hand, high level of feed-in tariff in Ukraine is justified by a number of economic and administrative barriers.

- The regulatory environment is unstable in Ukraine. Any new legislative rules concerning doing business may change in every moment (for instance concerning local content requirement, which will be discussed below).
- General conditions for doing business are poor because of high level of corruption and complicated system of tax administration.
- Uncertainties concerning Ukrainian public finance sustainability and weak banking sector make it difficult to obtain financing for building of renewable energy capacities.
- There are some technical issues concerning limited technical capabilities of electricity grid.

All of these factors make investments in Ukrainian renewable energy sector risky. And therefore high level of feed-in tariff compensates high risks of investments.

4.2 Tax incentives

Almost simultaneously with feed-in tariff, different types of tax incentives have been introduced to support renewable energy production. These incentives include various combinations of exemption from corporate income tax, VAT, customs duty and land tax.

Corporate income tax exemption applicable to production of renewable energy *inter alia* includes:

- Until 1 January 2021, any profits arising from the main activity of an electricity generating

company which generates electricity only from renewable energy sources (hereinafter - RES) is exempt from corporate income tax (CIT);

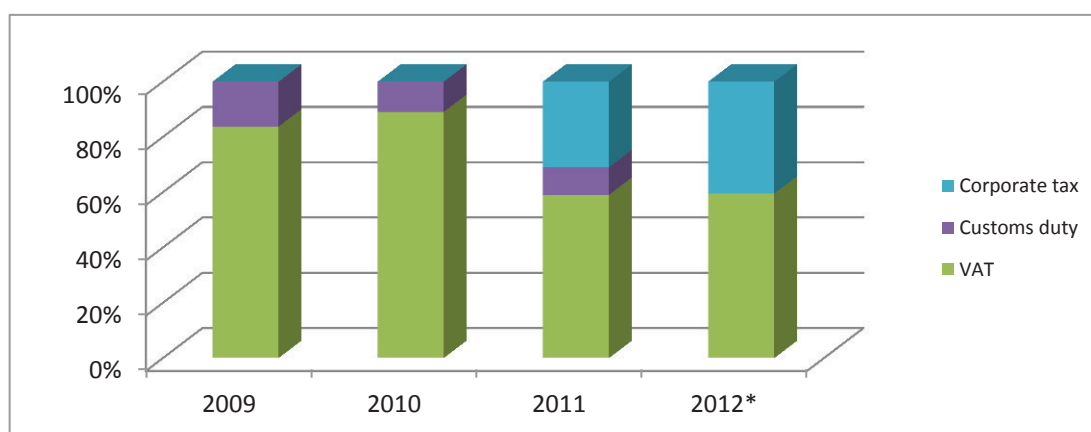
- 80% of the profit derived from transactions involving RES producing equipment and components, is exempt from CIT. To qualify for an exemption, the funds in question should be used by the company to increase its production;
- VAT/Customs Duties Exemption
- Importation into Ukraine of the raw materials, equipment and components used in the production of electricity from RES (analogs of which are not produced locally) is exempt from Ukrainian customs duty and import VAT.
- Temporarily until 1 January 2019, supply of RES equipment and facilities within the territory of Ukraine are exempt from VAT.

Land Taxes

RES producers pay only 25% of the normal payable amount of land tax.

Thus, the government interventions in the form of feed-in tariff and tax incentives have a strong impact on the renewable energy market. By introduction of feed-in tariff, the suppliers are able to ensure that all the energy produced will be demanded on the market at the distinct price. Tax incentives decrease production costs and make the production of renewable energy cheaper. Consequently, the level of the renewable energy produced in Ukraine increases and the investments in the sectors are growing.

The level of tax exemptions for renewable energy is really large as for tax relives just for one sector. In 2010 it was 0,15% of GDP, in 2011 – 0,27% of GDP and in 2012 – 0,18% of GDP. The most part of thee tax exemption was given for VAT exemption (fig. 1).



*customs duty tax exemption data in 2012 is not available

Fig. 1 The structure of renewable energy tax exemptions in Ukrain
(Ministry of Revenue and Duties of Ukraine)

Tax exemption from VAT for renewable energy equipment produced in Ukraine amounted of 39 million hryvnas in 2011. Tax exemption from VAT for importation of equipment was more than 2 billion hryvnas. Thus, foreign producers of equipment benefit from tax exemptions more than Ukrainian producers. Ministry of Revenue and Duties of Ukraine reported about wide use of tax exemptions for importation in different schemes for tax evasion. Nontransparent procedure for obtaining the tax exemption allows unfair firms to pay fewer taxes.

Anyway, the introduction of feed-in tariff and tax exemption has had a sustainable effect on the market, increasing the quantity of supplied energy. State Agency on Energy Efficiency and Energy Saving of Ukraine reported about the total power produced from renewable sources this year reached 600 MWh. At the moment 120 renewable energy plants were put into operation in Ukraine. Still, this is not enough to realise the potential of the market. In 2011, the share of renewable energy in energy consumption was less than 1%. Meanwhile in EU this indice has reached 13%. Nevertheless, the level of

investments into the sector is much more optimistic. According to Frankfurt School-UNEP Centre, asset finance of renewable energy in Ukraine gained 2,8 \$BN in 2012, what is 205% more than in 2011. Ukraine shows one of the highest growths of assets investments into renewable energy in the world in 2012 (Frankfurt School-UNEP Centre/BNEF, 2013). Such growth has been caused by financing of a series of hydro projects with the total capacity of 980MW and worth \$2.1 billion on the Dnister River.

5 IMPACT OF THE GOVERNMENTAL POLICY ON THE COMPETITION IN THE SECTOR

As mentioned above, governmental policy was a strong stimulus for development of the renewable energy sector in Ukraine. Nowadays, such type of business still cannot survive without governmental aid (i.e. costs and risks are too high). Thus, the main restriction for competition in this sector is eligibility for feed-in tariff and tax incentives.

In November 2012 Ukrainian Parliament has significantly changed the requirements to qualify for feed-in tariff. The main change was the introduction of local (Ukrainian) content requirement of ratio of works, materials and services, which must be met when establishing a new energy generation facility. According to the law, starting January 1, 2012 the share of raw materials, plant and equipment, works and services of Ukrainian origin in the construction cost of the renewable energy generation facility has to be at least 15% - starting from January 1, 2013, 30% - starting from January 1, 2013, and 50% - starting from January 1, 2014.

"Local content" may become an issue for further sector development, as there are just a few renewable energy equipment manufacturers in Ukraine (European - Ukrainian Energy Agency, 2011). The other issue is whether the quality of locally manufactured components would be comparable with quality of the analogical imported goods (European - Ukrainian Energy Agency, 2011).

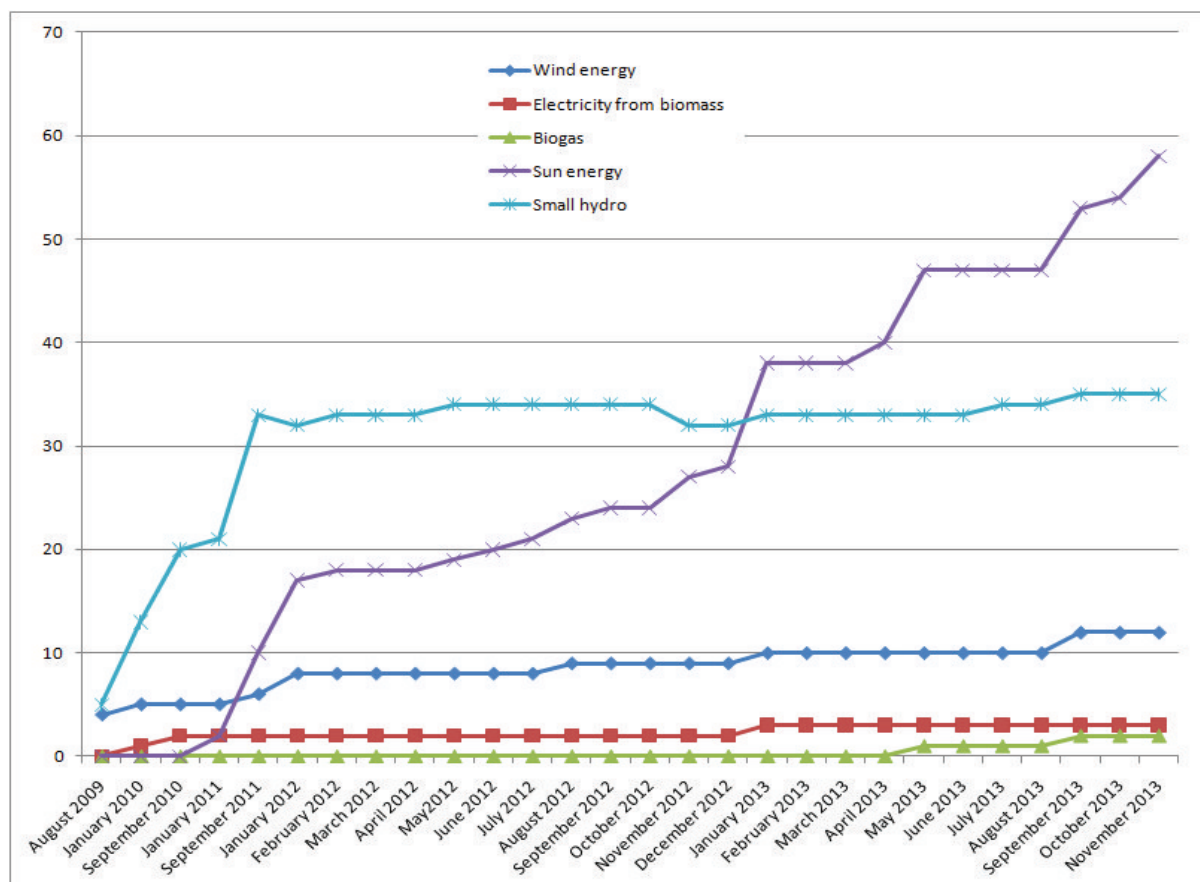


Fig. 2. Number of electricity producers who have obtained a feed-in tariff permit
(National Electricity Regulatory Commission of Ukraine)

Prior to the introduction of local content requirement, the number of entities allowed to use a feed-in tariff was growing very quickly. But as it may be seen from the fig.2, after November 2012 the tendencies in qualification for feed-in tariff remain almost unchanged. This could be explained by obtaining of the tariff by the entities that put into operation their generation facilities before the local content introduction, but for some reason did not get the tariff for that moment. Anyway, there is too little time to estimate the real effect of the local content requirement on the renewable energy market in Ukraine.

Another restriction for renewable energy market competition is comprehensive availability of tax incentives provided by state. As for 2012 only 59 entities used CIT Exemption, but more than 70 have put their production facilities into operation at that moment. As it has been mentioned before, the procedure for obtaining the feed-in tariff and tax incentives is complicated. Thus, for example in order to qualify for exemption from customs duty and import VAT, the equipment has to obtain a positive conclusion from the Ministry of Economic Development and Trade of Ukraine, and afterwards get registered with the Cabinet of Ministers of Ukraine (i.e. each item of the exempt goods has to be included in the special list approved by the Government) (Trypolska, 2012). Given the general level of corruption in Ukraine (according to Transparency International Corruption Indices Ukraine have got 144th rank from 176) there are some concerns whether this procedure could be easier and faster for some entities, than for other.

Before the “local content requirement” introduction the market could be characterised as monopolistic competition, as the market entrance required some access to financial recourses, specific technologies and knowledge, which can be regarded as entrance barriers. There are some concerns that local content requirement can transform this market in oligopolistic, due to the limited supply of Ukrainian renewable energy equipment and limited access to them. For example, PJSC “Semiconductor Plant”, the biggest Ukrainian producer of polysilicone (supplier materials for sun energy plants) is

wholly owned by ACTIV SOLAR, the biggest developer of large-scale photovoltaic installations in Ukraine (producer of sun energy and thus polysilicone consumer). Thus, such group companies will certainly have an advantage on the Ukrainian renewable energy market.

It is possible to conclude that certain conditions for obtaining feed-in tariff and tax incentives in Ukraine may have restrictive effect on the renewable energy market in Ukraine, however it is too early to test this hypothesis in practice.

CONCLUSIONS

Renewable energy subsidies represent a rare case of successful subsidies in Ukraine. For the past few years, the new innovative and environmentally friendly sector started rapid development in Ukraine. It may be opined that the benefits for the whole society resulting from renewable energy development will exceed just simple economic profit of a limited number of businesses.

This research has shown renewable energy industry made a success due to the feed-in tariff and a number of tax incentives. As in the middle of 2000-s, the development of the sector was weak, but after 2009 begins the rapid emergence of firms producing renewable energy.

Notwithstanding with the above, the rules for obtaining subsidies still contain some major risks for sector development. First of all, due to the difficult procedure for obtaining tax exemption, some entities cannot take advantage of these benefits. Moreover, the local content requirement limits the range of businesses which can enjoy feed-in tariff in Ukraine. These restrictive rules may limit the competition in the sector. In the moment the price for renewable energy is regulated by the government. In few years after achieving the point where the economy of scale starts to work, the sector will be competitive without any subsidies. Thus, it is very important to maintain maximum possible competition in the sector so that consumers can get the most favorable price.

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BOOK REVIEW OF STEVEN PINKER'S: "THE BETTER ANGELS OF OUR NATURE: WHY VIOLENCE HAS DECLINED"

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Category: **Book review**

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Editor's note: *This article is too large to fit into any one of our issues. But, due to its importance, we have decided to run it as a three part series. The first of these featured the introduction, the beginnings of Block's critique of Pinker (2011) and the appendix. Part II, presented here, contains most of the main body of this work. And the last appearance of this essay in three parts, in our fourth issue, will contain the author's conclusion and his voluminous bibliography. The third part of this essay you can read in the form of preview on our webpage "In the next issue" up to the July 15th, 2014.*

Part II

Here is another problem I have with our author. He states (236):

"But during the military revolution of the 16th and 17th centuries, states began to form professional standing armies. They conscripted large numbers of men from a cross section of society rather than just from the dregs at the bottom. They used a combination of drill, indoctrination, and brutal punishment to train them for organized combat. And they instilled in them a code of discipline, stoicism, and valor. The result was that when two of these armies clashed, they could rack up high body counts in a hurry. "

Note he admits that it was *states* that perpetrated

all of these evils. Does this give pause for thought to Pinker? It does not. However according to my scorecard: it is anarchists, 1; government, 0.

According to Pinker (242):

"Among liberals and conservatives alike, the notion took hold that war called forth spiritual qualities of heroism, self-sacrifice, and manliness and was needed as a cleansing and invigorating therapy for effeminacy and materialism of bourgeois society. Nowadays the ideas that there could be something inherently admirable about an enterprise that is designed to kill people and destroy things seems barking mad."

Would that this were true! However, Pinker seems a bit too naïve. He reckons without taking into account that as of this writing, the U.S. has

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some 1,000 military bases stationed in about 160 countries (Department of Defense, 2007; Vance, 2010). He reckons without taking into account the fact that Ron Paul was widely booed at the 2011 Republican presidential debate in South Carolina for urging that we treat others the same way we would wish to be treated.⁶⁰ He reckons without taking into account Krugman (and other Keynesians) who sort of favor war. These economists are indeed “barking mad.”⁶¹

However, our author goes too far in his anti-war sentiment when he writes (245):

“... war (is) ... economically futile. Plunder may have been profitable in primitive economies, when wealth lay in finite resources like gold or land or in the handiwork of self-sufficient craftsmen. But in a world in which wealth grows out of exchange, credit, and a division of labor, conquest cannot make a conqueror richer. Minerals don't just jump out of the ground, nor does grain harvest itself, so the conqueror would still have to pay the miners to mine and the farmers to farm. In fact, he would make himself poorer, since the conquest would cost money and lives and would damage the networks of trust and cooperation that allow everyone to enjoy gains in trade. Germany would have nothing to gain by conquering Canada any more than Manitoba would have something to gain by conquering Saskatchewan.”

Surely, war mongering can sometimes, at least theoretically, pay off, if the victory is easy. Does Pinker seriously suggest that if I attack Manhattan, seize all its assets, its real estate, etc., merely based on my threat to do so, with no loss of life or property at all, I would not gain economically? Suppose I declare “war” on Pinker himself, and come to own his far more

modest assets, his home, car, etc. I would not gain?⁶²

“Zero is the number of times that nuclear weapons have been used in conflict (since 1945)” writes pinker (249). Yes, yes. But thanks to governments many innocents have died at the hands of this exalted institution, just as assuredly as if they were directly murdered by the state as opposed to indirectly, via socialist roads, drug policies, etc.

Pinker (278) counters the claim that Nazi Germany was a democracy by characterizing it as a “dictatorship.” True enough. But that is not to deny its democratic roots. Hitler did *not* come to power through an anti-democratic coup de etat. Rather, his rise to the fuehrership came about *strictly* through the democratic process. Our author has a truncated notion of democracy. He claims (280) it is suspect to describe a given country in that manner if slavery is present, if women are not given the franchise. But prisoners are not typically access to the ballot box either. Are all nations with jails non-democratic? If so, there are precious few democracies on earth. Is the tyranny of the majority incompatible with democracy? My point here is that Pinker is guilty of a circular argument. He arbitrarily defines democracies as non-democratic if they do things he does not like. Germany when Hitler took over was indeed a democracy. Hitler came to power completely under a democratic process. If Pinker does not much like what Hitler did after he was accorded power under a democratic process (no man of good will does) he must not deny the democracy of Nazi Germany. He is logically obliged to acquiesce in the notion that sometimes the ballot box vote leads to bad things. Similarly, the U.S. was a democracy before 1865. Slavery existed before 1865. Therefore democracy is compatible with yet another evil, slavery. QED. Or would Pinker deny that slavery existed in the U.S. before 1865? Or that the U.S. was not a democracy before then?

⁶⁰ <http://abcnews.go.com/blogs/politics/2012/01/ron-paul-addresses-boos-from-south-carolina-gop-debate/>

⁶¹ Krugman, 2011; Watson, 2011; but also see Jones, 2011; Murphy, 2011; Gordon, 2012; Catalan, 2010. To be fair to Krugman, he is not calling for actual war (although Krugman 2011 calls World War II “lovely.”) However, where was the anti-war left during the Obama war years? Nowhere, that is where.

⁶² Famous bank robber Willie Sutton was once asked why he robs (makes war on) banks. His reply: “That's where they keep the money.” Sutton in this instance proves himself to be a better economist than Pinker.

Pinker (281) does adopt the moderate position that democracies go to war with each other “less often” than others. However, he also buys into (283) a biased view of democracy which is “based on how competitive its political process is.” But a polity is as much a democracy as any other despite how “competitive” it is. In Alberta, Canada, from 1935 to 1982, the ruling right wing party’s share of the votes (first Social Credit and then the Progressive Conservatives) approached levels only seen in such “democracies” as the USSR and Egypt, under Mubarak.⁶³ Does this mean that democracy did not function in this province, since the vote totals were not “competitive”? Not a bit of it. Also, it is entirely irrelevant “how many constraints are placed upon the leader’s power” (283). As long as these powers, whatever they are, emanate from the democratic process (e.g., voting), that is immaterial. These powers are democratic, no matter for what evil purposes they are used.

Pinker’s (289) treatment of world government is highly unsatisfactory. He does a good workmanlike job in rejecting this institutional arrangement: “a world government would have no alternatives from which it could learn better governance, or to which its disgruntled citizens could emigrate, and hence it would have no natural checks against stagnation and arrogance.” Pinker rejects the necessity, from his point of view, of supporting world government. But he contradicts himself with his support of the “international Leviathan (fn. 55, supra).” If this is not a precursor to world government, then nothing is. Pinker fails to realize that he is *logically compelled* to promote world government, based upon his rejection of anarchism. For if this international institution can become “stagnant

and arrogant” due to the fact that no one can vote with his feet against it (emigrate), it also applies, albeit to a lesser degree, to a large national state. It applies, too, to a smaller one, unless, of course, secession is allowed. The states of the U.S. fought a war over this issue in the mid-19th century;⁶⁴ the right of secession lost. Nor would a victory of the south have been sufficient. Nothing less than secession down not to the state, county, city, borough, neighborhood level would suffice. No, what is required is secession down to the individual level, if the lack of emigration problem is to be fully addressed.

Let us approach this issue from the other direction. It is said that individuals A and B (or state, county, city, borough, neighborhood) A and B will be at each other’s throats unless there is a sovereign above them, to impose peace on them. But *precisely* the same relationship applies to nations. Without world government, there is a state of anarchy between Belgium and Botswana, between Chile and Canada, between Denmark and Dubai, between Argentina and Algeria. Etc. the *only* way to end this chaos, this Hobbesian war of all against all, is to impose, you guessed it, world government. Let me put this in algebraic format, so that there can be no mistake about this:

$$\frac{\text{National Government}}{\text{Individuals}} = \frac{\text{World Government}}{\text{National Governments}}$$

Verbally, this means that national government is to individuals as is world government to national governments. QED.

The choice before us is twofold: anarchy or world government. Pinker has rejected the former on numerous occasions. He must then accept the latter, whether he likes it or not. But is this line of reasoning not “barking mad?”⁶⁵ After all, do we not now have some 190 nations on the face of

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http://en.wikipedia.org/wiki/List_of_Alberta_general_elections; this is also true, albeit to a lesser extent, in the U.S. As of January 2013, there will be one party control of the legislatures of 46 states; and further, “Half of all state legislatures will have one-party control strong enough to override their governor’s veto.” Source: <http://www.usatoday.com/story/news/politics/2012/12/13/states-supermajority-legislatures/1758567/>. Still, the U.S. is a democracy, it that word is to have any coherent meaning at all.

64 For the view that this war was fought over secession, not slavery, see DiLorenzo (2002, 2006); for the general case in favor of secession, see Adams, 2000; Block, 2002A, 2002B, 2002C, 2007A; Denson, 1997; DiLorenzo, 2002, 2006; Gordon, 1998; Hulsmann, 2003; Hummel, 1996; Kreptul, 2003; McGee, 1994A, 1994B; Rosenberg, 1972; Rothbard, 1967; Stromberg, 1979; Thies, 2009; Thornton, 1994; Thornton and Ekelund, 2004.

65 I confess, I like that term

the earth, which is neither anarchy nor world government? No, we do not. Or, rather, yes we do, but without world government, this is *anarchy* between all these countries. If anarchy is as terrible as Pinker warns us ("chaos," "barbarism") how can we tolerate any such situation? It might be argued that this present state of affairs is not that awful at all. After all, the long peace since World War II has radically reduced the danger threatened by this situation of anarchy between nations. If so, then how can Pinker argue with a straight face that we need national governments? If the forces of our better natures are so powerful as to keep nations from butchering each other, why does this not also apply to *intra* national relations? If we do not any more need a world government to keep international peace, by the same logic we no longer require national governments to do so within each country. Pinker seeks to have it both ways. The laws of logic will not allow him to do so.

However, it cannot be said that Pinker does not have a not unreasonable response to this criticism. He writes (299-300, footnotes omitted):

"(The most reliable) datasets tally direct or *battle-related deaths* – the people who are shot, stabbed, clubbed, gassed, blown up, drowned, or deliberately starve as part of a contest in which the perpetrators themselves have to worry about getting hurt. The victims may be soldiers, or they may be civilians who were caught in the crossfire or killed in "collateral damage." The battle-related death statistics exclude *indirect deaths* arising from disease, starvation, stress, and the breaking down of infrastructure. When indirect deaths are added to direct deaths to yield the entire toll attributable to the war, the sum may be called *excess deaths*.

"Why do the datasets exclude indirect deaths? It's not to write these kinds of suffering out of the history books, but because direct deaths are the only ones that can be counted with confidence. Direct deaths also conform to our basic intuition of what it means for an agent to be responsible for an effect that it causes, namely that the agent foresees the effect, intends for it to happen, and makes it happen via a chain of events that does not have too

many uncontrollable intervening links." The problem with estimating indirect deaths is that it requires us to undertake the philosophical exercise of simulating in our imagination the possible world in which the war didn't occur and estimating the number of deaths that took place in that world, which then is used as a baseline. And that requires something close to omniscience. Would a postwar famine have taken place even if the war had not broken out because of the ineptitude of the overthrown government? What if there was a drought that year – should the famine deaths be blamed on the war or on the weather? If the rate of death from hunger was going down in the years before a war, should we assume that it would have declined even further if the war hadn't occurred, or should we freeze it at its level in the last year before the war? If Saddam Hussein had not been deposed, would he have gone on to kill more political enemies than the number of people who died in the intercommunal violence following his defeat? Should we add the 40 to 50 million victims of the 1918 influenza pandemic to the 15 million who were killed in World War I, because the flu virus would not have evolved its virulence if the war hadn't packed so many troops into trenches?¹⁹ Estimating indirect deaths requires answering these sorts of questions in a consistent way for hundreds of conflicts, an impossible undertaking."

Yes, it cannot be denied that these contrary to fact conditionals (if private enterprise ran the roads, x lives would be thereby saved) are "an impossible undertaking" to pin down *exactly*. By definition, there can be no such thing as contrary to fact conditional statistic. But this gives Pinker no warrant, no warrant whatsoever, to ignore this phenomenon entirely, as he does. If he were a bit more modest, he would have at least mentioned these many other ways in which governments kill innocent people. There is no doubt that Pinker is wise to confine his statistics to direct deaths rather than focus on excess deaths (direct plus indirect ones) at least as a first approximation. But matters are not so dire statistically speaking regarding "an individual's risk of dying" (300), due to the FDA, highways, socialized medicine, drug war, prohibition of markets in used body parts.

There is no excuse at all for Pinker to consign to the memory hole the work of Peltzman (1973, 1974, 1987A, 1987B, 2005), who does offer specific data on deaths caused by the state in these ways. To ignore these, as does our Harvard psychologist, is to underestimate the harmful effects of his favorite institution. Better to at least keep them in mind, if nothing else, even if in no other way than as contrary to fact conditionals, than to completely lose sight of them.

The best explanation for our author's ignoring these phenomena is either oversight or outright bias, or both. If the latter I am unsure as to which predominates. On the one hand he is voracious in his coverage of data. That hints of bias. On the other hand, he is almost totally ignorant of the libertarian literature, which bespeaks oversight. In any case, he must not be allowed to hide behind the excuse of "an impossible undertaking." Yes, this does indeed apply to the "100s of conflicts" he mentions, but not to people dying before their time due to unwise government prohibitions of free enterprise.

Our author writes in this regard (320) "... there is a moral imperative in getting the facts right, and not just to maintain credibility." Further, he doubles down on this sentiment (321, footnotes omitted):

"Genocide also shocks the imagination by the sheer number of its victims. Rummel, who was among the first historians to try to count them all, famously estimated that during the 20th century 169 million people were killed by their governments. The number is, to be sure, a highball estimate, but most atrocitologists agree that in the 20th century more people were killed by democides than by wars. Matthew White, in a comprehensive overview of the published estimates, reckons that 81 million people were killed by democide and another 40 million by man-made famines (mostly by Stalin and Mao), for a total of 121 million. Wars, in comparison, killed 37 million soldiers and 27 million civilians in battle, and another 18 million in the resulting famines, for a total of 82 million deaths. (White adds, though, that about half of the democide deaths took place during wars and may not have been possible without them.)"

Yes. But if there is a "moral imperative" to count famines, why, then, not, also, deaths due to socialized medicine, drug wars, centrally planned highways, etc?

Pinker (317) appreciates the deleterious effects of foreign welfare (foreign aid). He acknowledges that it "can be another poisoned chalice." But domestic welfare, too, can ruin lives (Murray, 1984).

Pinker (328) launches into an unjustified attack on "Utopian ideologies (who) invite genocide for two reasons. One is that they set up a pernicious utilitarian calculus. In a utopia, everyone is happy forever, so its moral value is infinite. Most of us agree that it is ethically permissible to divert a runaway trolley that threatens to kill five people onto a side track where it would kill only one. But suppose it were a hundred million lives one could save by diverting the trolley, or a billion, or — projecting into the indefinite future — infinitely many. How many people would it be permissible to sacrifice to attain that infinite good? A few million can seem like a pretty good bargain."

He continues (329):

"The second genocidal hazard of a utopia is that it has to conform to a tidy blue print. In a utopia, everything is there for a reason. What about the people? Well, groups of people are diverse. Some of them stubbornly, perhaps essentially, cling to values that are out of place in a perfect world. They may be entrepreneurial in a world that works by communal sharing, or bookish in a world that works by labor, or brash in a world that works by piety, or clannish in a world that works by unity, or urban and commercial in a world that has returned to its roots in nature. If you are designing the perfect society on a clean sheet of paper, why not write these eyesores out of the plans from the start?"

But libertarianism too is an ideology. It is based on the NAP and property rights which stem from homesteading⁶⁶ and legitimate title transfer (Nozick, 1974). It is utopian in the sense that

⁶⁶ Block, 1990, 2002D, 2002E; Block and Edelstein, 2012; Block and Yeatts, 1999-2000; Block vs Epstein, 2005; Bylund, 2005, 2012; Hoppe, 1993, 2011; Kinsella, 2003, 2006; Locke, 1948; Paul, 1987; Rothbard, 1973, 32; Rozeff, 2005

socio-biological considerations⁶⁷ make it unlikely we shall ever attain any such a state of affairs. It is unlikely, with human beings as we know them, to ever entirely end the scourge of murder, rape, theft, etc. But it is a worthwhile utopian ideology for all that: *if* it could but be attained, it would be marvelous. Nor is it vulnerable to the “utilitarian calculus” of which our author quite properly warns us. This libertarian philosophy of Rothbard’s (1973, 1982) does not allow for the murder of *anyone* let alone “a few millions.”⁶⁸ Nor is libertarian utopianism subject to the objection that (331) “finally, there are the job requirements. Would you want the stress and responsibility of running a perfect world? Utopian leadership selects for monumental narcissism and ruthlessness.” It is not at all “ruthless”⁶⁹ to insist that we all keep our mitts off the person and property of others.⁷⁰ It is indeed true of libertarians that (331): “Its leaders are possessed of a certainty about the rectitude of their cause and an impatience for incremental reforms.” But as long as they strictly adhere to the tenets of this

philosophy there is little danger of any untoward results. Mao, Stalin and Hitler were ideological utopians from whom the world suffered greatly. This does not at all apply to libertarians such as Murray Rothbard, Ron Paul or William Lloyd Garrison.⁷¹

Pinker is enough of a libertarian himself (329) to defend middlemen, money lenders, but he is a poor enough economist to think that trade is rooted in the transfer of “equivalent value.” If that is what a person receives in trade, barter, purchase, sale, any other commercial interaction, why would he bestir himself to do so, for no net gain? Obviously, all economic actors expect that their situation will be *improved* not remain the same.

Our author is not unaware of a strain of thought to which libertarians subscribe (336, footnotes omitted):

“Partly because the phrase ‘death by government’ figured in Rummel’s definition of democide and in the title of his book, his conclusion that almost 170 million people were killed by their governments during the 20th century has become a popular meme among anarchists and radical libertarians. But for several reasons, ‘governments are the main cause of preventable deaths’ is not the correct lesson to draw from Rummel’s data. For one thing, his definition of ‘government’ is loose,

⁶⁷ Axelrod, 1984; Axelrod and Hamilton, 1981; Baillargeon, 1986; Barkow, Cosmides and Tooby, 1992; Baron-Cohen, 1995; Boyd, 1988; Buss, 1994, 1995; Cheng, Holyoak, Nisbett & Oliver, 1986; Cosmides, 1985, 1989; Cosmides & Tooby, 1987, 1989, 1992, 1997; Daly and Wilson, 1988; Dawkins, 1976, 1986, 1995; Fiddick, Cosmides & Tooby, 1995; Fodor, 1983; Frank, 1988; Garcia, 1990; Gigerenzer & Hug, 1992; Hirschfeld & Gelman, 1994; Johnson & Morton, J. 1991; Leslie, 1988, 1994; Maljkovic, 1987; Manktelow, & Evans, 1979; Markman, 1989; Mineka and Cook 1988; Moir and Jessel. 1989; Ohman, Dimberg and Ost, 1985; Pinker, 1994, 1997, 1999, 2002, 2008, 2011; Platt and Griggs, 1993; Ridley, 1986, 1993; Smith, 1976, 1978, 1988; Spelke, 1990; Sugiyama, Tooby & Cosmides, 1995; Symons, 1979, 1987, 1990, 1992; Tooby and Cosmides, 1990a, 1990b, 1990c, 1992; Trivers, R. 1971, 1972, 1985; Wason, P. 1966, 1983; Wason and Johnson-Laird, 1972; Williams, 1966; Wilson, 1975; Wright, 1994A, 1994B

⁶⁸ Libertarianism is at its root a theory of punishment for crime. It may be “ethically permissible to divert a runaway trolley” so that it kills one person instead of five, but anyone who did so would be guilty of murder in this view. So much for Pinker’s utilitarian calculations.

⁶⁹ Hayek (1944, ch. 10) explains why the “worst get on top.”

⁷⁰ Unless we obtain their permission.

⁷¹ Here is a quote from a libertarian utopian ideologue (Garrison, 1831), one who is “possessed of a certainty about the rectitude of (his) cause and an impatience for incremental reforms,” one with whom, presumably, Pinker would strongly disagree: “I am aware that many object to the severity of my language; but is there not cause for severity? I will be as harsh as truth, and as uncompromising as justice. On this subject, I do not wish to think, or to speak, or write, with moderation. No! No! Tell a man whose house is on fire to give a moderate alarm; tell him to moderately rescue his wife from the hands of the ravisher; tell the mother to gradually extricate her babe from the fire into which it has fallen; – but urge me not to use moderation in a cause like the present. I am in earnest – I will not equivocate – I will not excuse – I will not retreat a single inch – AND I WILL BE HEARD. The apathy of the people is enough to make every statue leap from its pedestal, and to hasten the resurrection of the dead.”

embracing militias, paramilitaries, and warlords, all of which could reasonably be seen as a sign of too little government rather than too much. White examined Rummel's raw data and calculated that the median democide toll by the twenty-four pseudo-governments on his list was around 100,000, whereas the median death toll caused by recognized governments of sovereign states was 33,000. So one could, with more justification, conclude that governments, on average cause three times *fewer* deaths than alternatives to government. Also, most governments in recent periods do not commit democides at all, and they prevent a far greater number of deaths than the democidal ones cause, by promoting vaccination, sanitation, traffic safety, and policing.

I have two problems with this very important passage. First, Pinker is playing fast and loose with the concept of "government." As we have established, the prefix "an" in front of "archy," or "anarchy" implies opposition to unjust rule. So the "militias, paramilitary and warlords" mentioned therein, and also the Blood, the Crips and the Mafia and any other tinhorn gangster, rapist or murderer, strictly speaking, are *also* governments. This holds insofar as any of these worthies engage in initiatory aggression against innocent people, just as do Pinker's "legitimate" governments. What Pinker really means by his distinction is not government versus non-government, but democratic government in contrast to all other political schemes. If so, let him say so, and stop bashing libertarian anarchism, or anarcho-capitalism. Democratic governments may have "cause(d) three times fewer deaths than non-democratic governments," but those are not by any means the only alternatives. Our author conveniently ignores free market anarchist institutions (Benson, 1990; Clay, 1997; Davies, 2002; Friedman, 1979, 2006; Leeson, 2007; Long, 1994; Peden, 1977; Powell, Ford, Nowrasteh, 2008; Stringham, 2003; Solvason, T. 1992; Thompson, 2006). Second, I have several times criticized Pinker on the ground that he avoids domestic government caused deaths due to drug laws, socialistic highways, medical care, etc. Until the above quoted passage from his book Pinker had a

plausible refutation of this claim of mine: he was only discussing deaths due to outright explicit murder (shooting, bombing, etc.). But here he has had the audacity to mention "traffic safety" and "policing." That possible refutation of his, then, is no longer open to him. He must now be forced to acknowledge government (democratic government) depredations in these and other such related fields, and can no longer hide behind, only, explicit government deaths due to shooting, bombing, torture, imprisonment.

We then read (337): "... the power of a democratic government is restricted by a tangle of institutional restraints, so a leader can't just mobilize armies and militias on a whim to fan out over the country and start killing massive numbers of citizens."

This may well have been true at least in the U.S. until World War II, at which time it was exceedingly rare for this nation to engage in imperialist wars without congressional approval. But since that time, the "leader," the president, most certainly *can* "mobilize armies and militias on a whim to fan out over the country and start killing massive numbers of citizens." Ron and Rand Paul have called for a return to this U.S. constitutional practice, but as of the time of this writing they have been spurned. Has Pinker been Rip Van Winkling it since 1941?⁷²

It is more than passing curious that Pinker (345) should admit that "Every year more than 40,000 Americans are killed in traffic accidents..." It is surprising that a facile mind such as his should not even think of this as a difficulty for his thesis. Any atrocitologist worthy of his salt would be brought up short by this horrendous figure. Pinker's otherwise excellent accomplishments in this arena are marred by this oversight. He continues down this erroneous path (346) by mentioning "measures that demonstrably save lives, such as enforcing lower highway speeds..." This is indeed possible. However, matters are a bit more complicated. If the maximum speed on

⁷² In Pinker's defense, these remarks are written on the understanding that "citizens" includes foreigners. If not, then the only explicit mass killing of U.S. citizens has been at the Waco massacre, where about 200 Branch Davidians were murdered. But this ignores the other usual suspects, highway fatalities, drug laws, etc.

the nation's highways was reduced to, say, 15 miles per hour, presumably, very few people, maybe none at all, would die of motor vehicle accidents. But thousands would perish as a result of the ensuing grinding to practically zero of transportation. What about 55 miles per hour? The double nickel was actually tried, not so much to save lives as to reduce oil consumption. Highway fatalities did indeed decrease. But what of the rise in deaths due to this emasculation of transportation? This is the "unseen" of Hazlitt (2008) and Bastiat (1845). The point is, without a competitive private enterprise highway industry (Block, 2009), we will never know whether this reduction in speed was worthwhile or not.⁷³ Perhaps it is not the average speed that kills, but rather the very significant variance in this variable that is responsible.

Pinker (382) supports the so called Civil Rights act of 1964. It cannot be denied that large parts of this legislation were entirely justified. But this law also weakened private property rights, surely the bedrock of a civilized order. It compelled owners to open their premises and serve people against their will. Here, our author contradicts his earlier (329) support for middlemen; owners of lunch counters who could no longer legally pick and choose their customers play precisely this role: they are intermediaries between customers and farmers. Unhappily, our author seems unaware of this logical contradiction of his; otherwise, I suspect, he would have at least attempted to justify it. He does no such thing.

It would appear that Pinker (398) is not totally adverse to the libertarian philosophy of anarcho capitalism. He supports "... the principle of *autonomy*: that people have an absolute right to their bodies, which may not be treated as a common resource to be negotiated among other interested parties." However, we must take this with a grain of salt, a large one, in view of the fact that he explicitly rejects anarchism all throughout his book, equating it with terrorism, chaos, murder, etc. But this philosophy is the only one fully compatible with "the principle of *autonomy*." He (398) does correctly assert that "Our current moral understanding does not seek to balance

the interests of a woman not to be raped, the interests of the men who may wish to rape her, and interests of the husbands and fathers who want to monopolize her sexuality. In an upending of the traditional valuation, the woman's ownership of her body counts for everything and the interests of all other claimants count for nothing." But he seems unaware that there is a widely respected and very prestigious school of thought (the University of Chicago Law and Economics tradition of Coase, Posner and Demsetz) that would quarrel with this.⁷⁴

We are informed (404) that "We are all feminists now." Maybe, well, this applies to most of us. But there are still a few holdouts.⁷⁵ Pinker (407) decries "segregation by sex." Curves is a woman only gymnasium franchise. Presumably, the "progressive" philosophy welcomed by this author allows "segregation by sex" for one gender but not the other. However, upholding the rights of free association is also the province of a few hold-out men's-only golf clubs, thank goodness, although there is extensive gnashing of teeth on the part of feminists at this outrage.

Pinker (407) comes out against "segregation by sex". This, presumably, implies opposition to male only golf clubs. But I wonder what he would think of gay bars, that limit themselves to serving only homosexual *men*. To say nothing of women-only gyms, such as the Curves franchise. Then, too, amongst Orthodox Jews, there are separate sections of the synagogue for men and women. To be consistent, he would have to reject them as well.⁷⁶ But logical consistency is not his strong suit. Am I being unfair to Pinker? Should I interpret his support or condemnation of the various practices he addresses under this rubric, solely in terms of whether or not they enhance or reduce violence? This would be a good defense of his analysis. Unfortunately, he never specifically limits the coverage of his commentary in this way. He speaks, instead, universally, as if

⁷³ We would be in the same position as the central planners of the USSR.

⁷⁴ Were Pinker but aware of this literature, I am sure he would join me in this critique: Block (1996A).

⁷⁵ Block, 2012A; Goldberg, 1973; Levin, 1984, 1987; McElroy, 1991; Mercer, 2003, 2005, 2006; Sommers, 1994; Taylor, 1992.

⁷⁶ That is, call for laws prohibiting them.

these institutions such as sexual segregation are to be rejected per se.

I cannot let pass Pinker's remark (415) about "the exploitation of children to clean chimneys and crawl through tunnels in coal mines." This is a Dickensian attack on the industrial revolution. To what is our author comparing this "exploitation?" To forced child prostitution in the modern era? To that plus, often, death in the 17th century? This is part and parcel of his lack of appreciation for the role of the industrial revolution in moving us in the direction of modern standards of living. We learn (417) that "The fateful tipping point between keeping and sacrificing a newborn is set both by internal emotions and by cultural norms. In a culture such as ours that reveres birth and takes every step to allow babies to thrive, we tend to think that joyful bonding between mother and newborn is close to reflexive."

No. The tipping point is far more likely to be increasing wealth, which enabled improvements in medical technology, more food for babies, less need for the triage on the basis of which babies were killed in earlier epochs. And a big boost to this happy state of affairs was the free market philosophy which allowed the industrial revolution to take place. Pinker (422-426) offers three other explanations: infanticide was criminalized, it became a taboo, and it was "a gift of affluence." And from whence did this affluence spring? From the economic system so denigrated by Pinker and his intellectual forebear, Dickens.

Our author deals with an objection to his Panglossian thesis (426): "According to an alternative history, the major long-term trend in the West is that people have switched from killing children shortly after they are born to killing them shortly after they are conceived." Pinker (427) rejects this on the ground that

"Modern sensibilities have increasingly conceived moral worth in terms of *consciousness*, particularly the ability to suffer and flourish, and have identified consciousness with the activity of the brain... The vast majority of abortions are carried out well before the milestone of having a functioning brain, and thus are safely conceptualized, according to this understanding of the worth of human life, as fundamentally

different from infanticide and other forms of violence."

But this rationalization will not do. Sleeping persons, unconscious people, do not have "functioning brains" either.⁷⁷ We would hardly contemplate killing them for this reason. Both of course, have this *potential*. But the same can be said for the fetus, even as a mere fertilized egg, the earliest stage of development.⁷⁸

Our author is a bit more sensible on the industrial revolution when he writes (433):

"Though the Industrial Revolution originally moved children from backbreaking labor on farms to backbreaking labor in mills and factories, legal reforms increasingly restricted child labor. At the same time, the affluence that flowed from the maturing Industrial Revolution drove rates of infant mortality downward, reduced the need for child labor, and provided a tax stream that could support social services. More children went to school, which soon became compulsory and free."

However, this is not really good enough. People "voted with their feet" from farm to mill. We are entitled to deduce from this fact alone, *ceteris paribus*, that this constituted an *improvement* not merely a sideways movement from one kind of "backbreaking labor" to another. "Legal reforms" did not at all "restrict ... child labor." Rather, 'twas the increasing *wealth* emanating from the industrial revolution that enabled this, although, certainly, legislation tried to *take credit* for this beneficial course of events. A simple mental experiment ought to convince anyone of this. If the law went too fast in legally limiting child labor, went ahead of the reduction that could be justified on the basis of increasing productivity, then children would have *died*, and only would

⁷⁷ That is, there is no consciousness there. The brains are "functioning" in the sense of "telling" the organs of the body what to do, but machines can enable comatose people to do that as well, and their brain function is certainly compromised.

⁷⁸ For the libertarian theory of abortion, which does not fit into either category of "pro-life and pro-choice" (428), the only options Pinker appears to recognize, see Block, 1977, 1978, 2001, 2004, Block and Whitehead, 2005

have been released from onerous work in that manner.⁷⁹

Pinker's views on spanking children are also problematic. He (435) writes: "But perhaps the most compelling reason to avoid spanking is symbolic... Spanking contradicts the ideal of nonviolence⁸⁰ in the family and society." But this author appears to support (431, 435) the practice of "time-outs." However, a "time-out" is equivalent to kidnapping, surely a violent offense. Suppose I were to give Pinker a time out for writing this in many ways brilliant, but also execrable book. I would then have to force, compel, him to stop whatever he would otherwise be doing, and instead go stand in the corner or some such place. When one adult treats another in this way surely it is incompatible with the "nonviolence" Pinker supports. And suppose the child refuses to take a time out. Is it a NAP violation to twist his arm to make him do so? The point is, if children are to be treated as adults, then *no* compulsion may properly be used against them. This will strike anyone who has ever brought up children as highly problematic.

We learn (437) that "Children are people and like adults they have a right to life and limb (and genitalia) that is secured by the social contract that empowers the state. The fact that other individuals – their parents – stake a claim of ownership over them cannot negate that right." There are problems here. In the libertarian

society, children cannot be "owned." All that can be the subject to a "claim of ownership" is the right to be the guardian of the child. This is earned by giving birth to the child, or claiming it through a surrogacy contract. It can be maintained by guarding the child, taking care of it, etc.⁸¹ And, sometimes, rarely, this can best be accomplished with a loving spanking.⁸² Our author does not seem to realize that children are *different* than adults. They are uncivilized. Although, given man's inhumanity to man, I may well be overstating matters here. Our author (441) seems to be cognizant of this fact: "Bullying has probably been around for as long as children have been around, because children like many juvenile primates, strive for dominance in their social circle by demonstrating their mettle and strength."⁸³ Perhaps bullies should be spanked, to show them how it feels to be on the receiving end of violence? Pinker does not say.

Second, from whence arises this "social contract?" Does Pinker, who presumably lives and dies by empirical evidence, have anything of the sort to supply in support of the existence of this "social contract?" Of course not. It is a total fabrication. He makes these things up as he goes along. I don't remember signing any such document. And without it, everything the government does, everything, constitutes the very violence that Pinker is so intent upon demonstrating the reduction thereof.⁸⁴

We read an interesting passage here (465, footnote deleted):

"For Singer, these analogies are far more than rhetorical techniques. In another book, *The*

⁷⁹ Much the same phenomenon occurred with regard to hours legislation. Reduce it by too much, more than increasing productivity would allow, and, again, needless deaths are the result. The law *followed* the reduction in hours of work; it did not lead it. If we could by a magical stroke of the legislative pen accomplish these tasks, why has not the law prohibited people from working more than, oh, 5 hours a week? Why have our politicians been so niggardly with regard to child labor? Why do they not prohibit labor from anyone aged less than 35 (55) years? Now, *that* would be generous. From where I stand, I am 71 years old, 35 and even 55 year olds are mere children. Surely, the government should come to their rescue.

⁸⁰ Nonviolence is not an ideal in the free society. Boxing is violent. Football is violent. Video games are violent. Movies are violent. Even novels depict violence. The act that should be prohibited is not "violence", but rather *initiatory* violence. Namely, the NAP should be respected; e.g., libertarianism.

⁸¹ When Terri Schaivo's husband (Block, 2011D) wanted to pull the plug on her, he was no longer guarding her life. This guardianship having come to an end, his control over her fate should have been immediately taken from him.

⁸² For an elaboration of the libertarian perspective on children's rights, see Block, 1976, 2003A, 2004B, 2011D; Block and Fleischer, 2010; Evers, 1978A, 1978B; Feser, 2004; Rothbard, 1982B, chapter 14.

⁸³ The movie "Lord of the Flies" seems to be an apt illustration of this phenomenon.

⁸⁴ See this material for a stern rebuke of the "social contract" fallacy: DeJasay, 1989; Evers, 1977; Machan, 1983; Outlaw, 2008; Spooner, 1870, which, of course, Pinker does not condescend to address.

Expanding Circle, he advanced a theory of moral progress in which human beings were endowed by natural selection with a kernel of empathy toward kin and allies, and have gradually extended it to wider and wider circles of living things, from family and village to clan, tribe, nation, species, and all of sentient life.²⁷⁴ The book you are reading owes much to this insight.”

This however is undercut by the statolatry which permeates “the book (I am) reading.” Pinker opposes spanking children. But the government “spansks” its residents through taxation, regulation, inflation, public ownership, etc.⁸⁵ Even purely democratic governments foist the “tyranny of the majority” on those subject to its rule. If our Harvard professor is so interested in “expanding” or “extending” rights, why does he not do so for the long-suffering denizens of modern states? Even assuming, arguendo he is correct in his claim that they are an improvement over what went on before, he could still acknowledge their murderousness and leave off defending them via entirely fabricated “social contracts” which relieve these institutions of the charges against them. If we have agreed to be governed by them, due to this “social contract,” we cannot in good conscience object to their depredations. In like manner, the professional boxer who is punched (above the belt) cannot complain of assault and battery.

In Pinker’s view (477): “The hidden hand of an information economy may have made institutions more receptive to women, minorities, and gays, but it still took government muscle in the form of antidiscrimination laws to integrate them fully.”⁸⁶

Does he favor compulsory bisexuality? It is politically correct to say that male heterosexuals are discriminatory and prejudicial⁸⁷: they exclude

half the human race as potential love – bed partners. But female heterosexuals are guilty of the same identical crime; they, too, exclude half the human race as potential love – bed partners. It is not politically correct to assert this, but I will say it anyway,⁸⁸ homosexuals, both male and female, are also discriminatory and prejudicial; they, too, exclude half the human race as potential love – bed partners. It is only bisexuals who are free of this egregious behavior. But wait: even these saints discriminate on the basis of beauty (lookism), sense of humor (laughism), intelligence (IQism), age (ageism), odor (olfactoryism), and hundreds of other criteria.⁸⁹ Curious minds want to know: does Pinker himself, forsooth, engage in any of these “poisonous beliefs”?

Females, minorities ... are still not “fully integrated.” Presumably, this means they are not paid equally. This is because compensation in the free market is based on productivity, and these groups do not boast of this characteristic as much as white males.⁹⁰ I expect that belief in this true explanation is also “poisonous.”

Our author blatantly contradicts himself, once again, when he (479) both supports Martin Luther King’s referral to a “taboo on violence,” but also notes that his civil “rights” movement made “a nuisance of itself with sit-ins, strikes.” But what does Pinker think that sit-ins and strikes *are*, if not violent violations of property rights? They constitute trespass! Initiatory aggression. It is more than passing curious that the writer of a book on violence fails utterly to recognize these acts as such. Suppose I were to engage in a “sit-in” in Pinker’s living room, and refused to vacate his premises when he asked me to do so. Posit that I organize a “strike” at chez Pinker. I and my colleagues surround his house and refuse to allow him and his family, and delivery-men too, to ingress or egress. Would Pinker consider this a violent violation of his rights? Would he even consider it violent? If not, he has a strange understanding of this concept. But this is *precisely* what Martin Luther King and his

⁸⁵ At least the spanked child, presumably, assuming no child abuse, did something wrong, on the basis of which he is penalized in this manner. In sharp contrast, the victims of statism are innocent of any crime, and are “spanked” regardless.

⁸⁶ On p. 389 he defends affirmative action, opposes discrimination.

⁸⁷ It is politically correct to criticize male heterosexuals for just about anything, so uncivilized we have become, from allowing feminism and “progressives” into the intellectual and moral parlor.

⁸⁸ It is not politically correct to criticize homosexuals of either gender for anything.

⁸⁹ Don’t get me started.

⁹⁰ Lukas, 2011.

minions did. Pinker and the “civil rights” movement may not consider it violent but the owners of the lunch counters surely did, as would Pinker, too, if this occurred in his living room or around his house. If Pinker tossed me out of his domicile on my rear end it would be *me* who was the violent one, and not him. Yes, this is no great stakes compared to the lethal violence employed all too often on our planet. But violence is violence is violence, and in a book dedicated to charting this phenomenon it is not too much to ask that the scholar studying it be clear on what it means, when it takes place and to cease and desist from *supporting* it, as in this case.

Let us further probe our Harvard professor's understanding of violence, a core concept of his book. In the view of Pinker (510): “Psychopaths ... perpetrate nonviolent crimes like bilking elderly couples out of their life savings⁹¹ and running a business with ruthless disregard for the welfare of the workforce or stakeholders.⁹²” It cannot be denied that fraud is a non-violent crime. But what about maximizing profit? If the latter consists of buying low and selling high, or price gouging, of monopolizing, engaging in cutthroat competition, it is not violent, and not a crime. On the other hand if the employer is cheating employees out of their salary, paying them less than the agreed upon wage, it is nonviolent, but is as much of a crime as any other instance of fraud. But if the firm pollutes,⁹³ it constitutes a violent criminal act under libertarian law, in much the same way as do sit-ins or strikes.⁹⁴

Pinker appears to be on the side of our devils, not our angels, in his support of the market failure doctrine of public goods. He (522) avers:

“Our fitness depends not just on our own fortunes but on the fortunes of the bands, villages, and tribes we find ourselves in, which are bound together by real or fictive kinship, networks of reciprocity, and a commitment to public goods, including group defense. Within the group, some people help to police the provision of public goods by punishing any parasite who doesn't contribute a fair share, and they are rewarded by the group's esteem.”

But does not calling someone a “parasite” constitute a “hate crime” against which our author inveighs? Here is a man, call him Joe, minding his own business, a pacifist. He sees no danger, no need for any “group defense.” His principles forbid him to contribute to any such project in any case. He is deemed a “parasite” and “punished,” while the likes of Pinker stand on the sidelines, applauding. This is our better nature?⁹⁵

Pinker (523, footnote deleted) offers the following for our consideration:

“...people, to varying degrees, harbor a motive they call social dominance, though a more intuitive term is tribalism: the desire that social groups be organized into a hierarchy, generally with one's own group dominant over the others. A social dominance orientation, they show, inclines people to a sweeping array of opinions and values, including patriotism, racism, fate, karma, caste, national destiny, militarism, toughness on crime, and defensiveness of existing arrangements of authority and inequality. An orientation away from social dominance, in contrast, inclines people to humanism, socialism, feminism, universal rights, political progressivism, and the egalitarian and pacifist themes in the Christian Bible.”

I note that while he does not include capitalism in the former bad category, “inequality,” one of the

⁹¹ Does he mean social security? Surely not. Yet, the appellation fits. Ferrara, 1982, 1985; Gruber and Wise, 1999; Juurikkala, 2007a, 2007b; MacKenzie, 2007; Murphy, 2005B; Reisman, 2005; Rockwell, 2004; Rothbard, 1990; Rounds, 2005; Sennholz, 2004; Steinreich, 1996.

⁹² For the view that so-called “stakeholders” have no rights at all, see Block, 1993, 2000; Klein, 2001; Marcoux, 2002; O'Neill, 2008; Scott, 1998

⁹³ Trespasses dust particles onto other people's property (Rothbard, 1982A).

⁹⁴ A mass quit must be sharply distinguished from a strike (Block, 2010).

⁹⁵ For a critique of the public goods argument, see Barnett and Block, 2007, 2009; Block, 1983, 2003; Bibliography, undated; Cowen, 1988; De Jasay, 1989; Holcombe, 1997; Hoppe, 1989; Hummel, 1990; Osterfeld, 1989; Pasour, 1981; Rothbard, 1985, 1997; Schmidt, 1991; Sechrest, 2003, 2004A, 2004B, 2007; Tinsley, 1999.

attributes of this system does appear there.⁹⁶ And "socialism"⁹⁷ makes its way into the good file. Yet capitalism⁹⁸ has rarely been responsible for any deaths; the same cannot be said for socialism, on the other hand.⁹⁹ This is more than passing curious, coming from someone who favors our better angels.

Our author claims (524) that "in the arena of interstate relations" Canada (does not) make trouble. But this war-mongering nation stationed troops in Afghanistan, even though the latter never posed any threat to the former. Pinker (536) erroneously buys into the light-house-as-public-good market failure argument. He also misconstrues the tragedy of the commons as yet another market failure, when he says: "One can imagine ...¹⁰⁰ real-life examples."

"One can imagine a group of fishermen chipping in for harbor improvements such as a lighthouse, or merchants in a block of stores pooling contributions for a security guard.) The best outcome for the group is for everyone to contribute the maximum amount. But, the best outcome for an *individual* is to stint on his own contribution and to be a free rider on the profits from everyone else's. The tragedy is that contributions will dwindle to zero and everyone ends up worse off. (The biologist Garrett Hardin proposed an identical scenario called the Tragedy of the Commons. Each farmer cannot resist grazing his own cow on the town commons, stripping it bare to everyone's loss. Pollution, overfishing, and carbon emissions are equivalent real-life examples."

⁹⁶ Inequality rears its head in all real world examples of socialism, too. It is a human condition. For its defense, see Rothbard, 1971.

⁹⁷ We are now talking about coercive socialism, or state socialism, not the voluntary socialism that exists in the commune, the kibbutz, the monastery.

⁹⁸ Laissez faire, not crony

⁹⁹ Think Mao, Pol Pot, Hitler, Stalin, socialists all.

¹⁰⁰ Fishermen? I am shocked, shocked at this violent anti-feminist outburst. Surely, "fishers," or "fisherpersons" would be better. But I'm not sure of the latter, given its violent last syllable. Perhaps "fisherdaughters?"

The reason for difficulties with overfishing¹⁰¹ and light-houses¹⁰² is that private property in the oceans is not allowed by law. Likewise, the tragedy of the commons arises not when people voluntarily own things in common, as in partnerships, but when they are *compelled* by law to do so, or are legally prohibited from dividing up the "commons." Pollution, carbon emissions, etc., are a trespass, yet another violation of private property rights (Rothbard, 1982) and again not a market failure of the public goods variety. I do not deny that the overwhelming majority of economists would subscribe to Pinker's viewpoint on this matter. As a non economist, he can perhaps be forgiven for adopting their perspective. But a thorough researcher would not have contented himself with blindly following majority opinion. He would not have done anything like this in his own field of specialty. He should have at least mentioned, if not attempted to refute, alternative views, such as those mentioned in footnote 95, supra.

Opines Pinker (539): "... an embezzler who used his ill-gotten gains to support a lavish lifestyle would seem to deserve a harsher punishment than one who redirected them to the company's underpaid workers in the developing world." This is yet another unwarranted attack on the free enterprise system in general, and on "sweat shops" in particular, indicative of economic illiteracy. Even Krugman (1997), as ignorant of the dismal science as any Keynesian, had this to say about that institution: "It is the indirect and unintended result of the actions of soulless multinationals and rapacious local entrepreneurs, whose only concern was to take advantage of the profit opportunities offered by cheap labor. It is not an edifying spectacle; but no matter how base the motives of those involved, the result has been to move hundreds of millions of people from abject poverty to something still awful but nonetheless significantly better."¹⁰³

¹⁰¹ Block, 1999C, 2011C; Cordato, 2004; Hardin, 1968; Rothbard, 1982A; Smith, 1981

¹⁰² Barnett and Block. 2007, 2009.

¹⁰³ For more defenses of sweat shops, see Block, 2008, 2011B; Greene, Henry, Nathanson and Block, 2007; Krugman, 1997, 2001; Myerson, 1997; Powell, 2006, 2008, undated; Powell and Skarbek, 2006;

Pinker (556) launches a blanket condemnation of "ideology":

"... it's ideology that drove many of the worst things that people have ever done to each other. They include the Crusades, the Euro-Russian and the Chinese civil wars, the Vietnam War, the Holocaust, and the genocides of Stalin, Mao and Pol Pot. And ideology can be dangerous for several reasons. The infinite good it promises prevents its true believers from cutting a deal. It allows any number of eggs to be broken to make the utopian omelet. And it renders opponents of the ideology infinitely evil and hence deserving of infinite punishment."

But these are not *good* ideologies. For his part, our author certainly espouses a few of them all throughout his book: peace, civility, violence reduction, an "open society,"¹⁰⁴ etc. Further, if there can be "virulent ideologies," and certainly we have plenty of those, then there must be good ideologies, also. Thus, the blanket condemnation of "ideology" is unjustified. I hereby nominate anarcho-capitalism as a good ideology; it certainly allows for and indeed includes the "open society" where no one is (legally) punished for airing *any* viewpoint.¹⁰⁵ The suffix "ology" means, merely, the systematic *study* of something. For example, biology is the study of life. In like manner ideology would be the study of ideas, surely a neutral or even beneficial undertaking. Perhaps Pinker is confusing ideology and demagoguery?

Our author next buys into the "libertarian paternalism" fallacy foisted upon us by Sunstein

and Thaler (2003, 2007).¹⁰⁶ Does Pinker even mention, let alone attempt to refute, the utter evisceration these ideas have received from Austro libertarians such as Whitman and Rizzo (2003, 2007)? To ask this is to answer it. He follows this up with the view that "gun control laws" (607) reduce violence, while again ignoring evidence to the contrary.¹⁰⁷

Pinker (622) mentions "dangerous territory such as wars of conquest, the use of chemical and nuclear weapons, dehumanizing racial stereotypes, casual allusions to rape and the taking of identifiable human lives."

Notice any strange juxtapositions here? Surely, articulating "dehumanizing racial stereotypes," and offering "casual allusions to rape" do not deserve to be placed in the same sentence as "wars of conquest, the use of chemical and nuclear weapons, ... and the taking of identifiable human lives." As it happens, Pinker is himself guilty of utilizing "dehumanizing racial stereotypes." He (94) takes note of the fact that the black murder rate is much higher than that of whites:

"Louisiana's homicide rate is higher than those of the other southern states, and the District of Columbia (a barely visible black speck) is off the scale at 30.8, in the range of the most dangerous Central American and southern African countries. These jurisdictions are outliers mainly because they have a high proportion of African Americans. The current black-white difference in homicide rates within the United States is stark. Between

Powell and Zwolinski, 2012; Williams, 2004; Zwolinski, 2007

¹⁰⁴ He himself (569) writes: "Though nothing can guarantee that virulent ideologies will not infect a country, one vaccine is an open society in which people and ideas move freely and no one is punished for airing dissenting views, including those that seem heretical to polite consensus." But this "vaccine" is itself an ideology. George Jonas makes a similar error. For a refutation, see Block, 2013.

¹⁰⁵ People may be privately and non-violently "punished," and properly so, for saying just about anything. For example, I hereby condemn Nazism, Socialism and Communism, and will boycott advocates of these pernicious doctrines whenever possible (well, convenient).

¹⁰⁶ He claims (607) that "We authorize our employers to invest a part of every paycheck for our retirement." Evidently, Pinker thinks that this is a voluntary choice, not compelled by the social security laws, under threat of, of course, *violence*. Au contraire, we do not "authorize" any such thing. This results from paternalist compulsion. If we are so stupid, and have such high time preferences that we will not save for our old age, or for the proverbial "rainy day," how can we untermenschen be smart enough to be allowed to vote? And, if we mundanes are intelligent enough to be entrusted with access to the ballot, why does this not apply to our savings rates?

¹⁰⁷ Footnote 38, *supra*. Pinker does list Lott, one of the key theoreticians and statisticians of this issue in his reference section, but not on his specialty, gun control laws.

1976 and 2005 the average homicide rate for white Americans was 4.8, while the average rate for black Americans was 36.9. It's not just that blacks get arrested and convicted more often, which would suggest that the race gap might be an artifact of racial profiling. The same gap appears in anonymous surveys in which victims identify the race of their attackers, and in survey in which people of both races recount their own history of violent offences."

These are stereotypes, and would undoubtedly be considered "dehumanizing" by the politically correct. Pinker is to be congratulated for courageously mentioning these politically incorrect facts. They are merely empirical generalizations, inductions, as are *all* stereotypes. But he is not at all to be congratulated for contradictorily¹⁰⁸ rejecting the use of "dehumanizing racial stereotypes."

Pinker seems never to have heard of the concept "immoral." He writes (622): "The world has far too much morality. If you added up all the homicides committed in pursuit of self-help justice, the casualties of religious and revolutionary wars, the people executed for victimless crimes and misdemeanors, and the targets of ideological genocides they would surely outnumber the fatalities from amoral predation and conquest."

But why call this *morality*? Surely, it is *immoral* to do these things.

Our author engages in a common error regarding "harm." In his view (624-625): "The intuitions that we in the modern West tend to think of as the core of morality – fairness, justice, the protection of individuals, and the prevention of harm – are just one of several spheres of concern..." No. It is entirely licit to harm other people in a myriad of ways. If I open up a grocery right next door to the Pinker emporium, I have indubitably "harmed" him in some real sense, as I compete away from him half his customers. But I have every *right* to do just that. Pinker has himself "harmed" at least one scholar by taking on a professorship at Harvard, which would have gone to someone else had he not done so.

¹⁰⁸ The motto at Harvard must surely be: "logical consistency is the hobgoblin of small minds." Perhaps it is: "Do as I say, not as I do."

Pinker's anti market bias rises to the fore when he maintains that (630) "a good case against ... an open market for ... body organs ... (is) ... that the poor might sell their organs out of desperation." But if they were that desperate, it is necessarily so that what they can purchase with the proceeds of such a sale would be worth way more than the value they place on these body parts they are so anxious to supply. Suppose that the only way a man can save his child's life if by selling his kidney to a rich person in need of it. Pinker, presumably, would ban such a life-saving and life-affirming sale, even though the only way for him to do so would be to initiate *violence* against both the intended recipient and donor. Such prohibitions cause needless suffering and death, something we would expect Pinker's "better angel" not to countenance.

Either his worst angel has taken over his psyche at this point in his writing of the book, or, as I suspect, he heart is still in the right place, but an organ further up in his body is just not functioning on all cylinders. Nor is this likely only a typographical error on his part, for on the very next page (631) he supports the taboo opposed to "selling out ... an organ ... for barter or cash."¹⁰⁹ Further, Pinker notes (632-633): "... libertarians would allow people to negotiate virtually any resource under Market Pricing, including organs, babies,¹¹⁰ medical care,

¹⁰⁹ For the benefits of "selling out ... an organ" see footnote 18. Pinker also opposes "selling out ... oneself." For the case in favor of voluntary slavery, see Andersson, 2007; Block, 1969, 1999B, 2001, 2002, 2003C, 2004A, 2005, 2006, 2007A, 2007B; Nozick, 1974, pp. 58, 283, 331; Philmore, 1982; Steiner, 1994, pp. 232. Of course, it cannot be denied, a person might sell a kidney for a luxury automobile, or for something else that most of us would look upon as frivolous. But should not such a foolish decision be allowed by law? If people are so stupid as to agree to such deals, and they are, they are, then how can we allow them to vote? And, if we cannot do so, what happens to Pinker's favorite means of selecting governments, democracy?

¹¹⁰ Libertarians do not at all support the sale of babies. This would apply not to the babies themselves, which implies (non voluntary) slavery, but rather the right to bring up a baby, function as a guardian for it, which is quite a different matter. For more elaboration, see footnote 81, *supra*.

sexuality and education.” He does not, as per usual, condescend to instruct his readers as to why libertarians are mistaken in this view of theirs.

Pinker registers his disapproval of (635): “... the opening of foreign markets with gunboats.” I support him in this, but only provisionally. If it is government A that is doing this to government B, then our author is entirely in the right. States Rothbard (1963) of this type of act:

“All State wars, therefore, involve increased aggression against the State's own taxpayers, and almost all State wars (*all*, in modern warfare) involve the maximum aggression (murder) against the innocent civilians ruled by the enemy State. On the other hand, revolutions are generally financed voluntarily and may pinpoint their violence to the State rulers, and private conflicts may confine their violence to the actual criminals. The libertarian must, therefore, conclude that, while some revolutions and some private conflicts *may* be legitimate, State wars are *always* to be condemned.”

But suppose it is a private group that is attacking government B for not allowing free markets to operate in this manner. Do they have justice on their side? It is difficult to avoid this conclusion, since the initial closing of markets¹¹¹ was itself a prior initiatory act of violence. Libertarians are not pacifists. In countering such a depraved statist act of government B's, the forces of justice, whether they use “gun boats” or not, are clearly *defending* civilized values. They are promoting prosperity and in so doing are saving lives. Pinker might as well condemn a (hopefully private) policeman for stopping a mugger, a rapist or a murderer on the ground that this, too, constitutes violence. Pinker's pacifism appears to be a bit biased against economic liberty. Question for Pinker: suppose a “gun boat” was used to stop a rape; would you oppose this?

But wait. Pinker shifts gears once again and performs another 180 degree about face (636-637):

“The momentum of social norms in the direction of Market Pricing gives many people the willies, but it would, for better or worse, extrapolate the trend toward nonviolence. Radical libertarians, who love the Market Pricing model, would decriminalize prostitution, drug possession, and gambling, and thereby empty the world's prisons of millions of people currently kept there by force (to say nothing of sending pimps and drug lords the way of Prohibition gangsters). The progression toward personal freedom raises the question of whether it is morally *desirable* to trade a measure of socially sanctioned violence for a measure of behavior that many people deem intrinsically wrong, such as blasphemy, homosexuality, drug use, and prostitution. But that's just the point: right or wrong, retracting the moral sense from its traditional spheres of community, authority, and purity entails a reduction of violence. And that retraction is precisely the agenda of classical liberalism: a freedom of individuals from tribal and authoritarian force, and a tolerance of personal choices as long as they do not infringe on the autonomy and well-being of others.”

This is as good a ringing endorsement of anarcho-capitalism as any in the literature. Murray Rothbard himself doesn't say it much better than this.¹¹² Perhaps I was too harsh in upbraiding Pinker for lacking “foolish consistency.” I should vastly prefer that Pinker contradict himself when he says brilliant things like this, than that he be a consistent anti market statist.¹¹³

Whereupon Pinker (637) reverses field once again and delivers himself of this war-mongering statement, when he supports: “... the policy of responding to international provocations with economic sanctions and tactics of containment rather than retaliatory strikes.”

¹¹¹ Up to and including those for drugs, used body parts, guardianship of babies, any prohibition of what Nozick (1974) called “capitalist acts between consenting adults.” Hey, Nozick too was a Harvard professor.

¹¹² This is about the highest level of praise I am capable of giving.

¹¹³ It is fair to say, however, that Pinker is the Romney (weathervane) of political economy.

But sanctions kill innocent people, often more than the surgical strikes accomplished with drones.¹¹⁴ With regard to the atrocity of sanctions, then-Secretary of State Madeleine Albright was asked if the U.S. sanctions against Iraq, which were responsible for killing some half a million children, were “worth it.” She replied in the affirmative.¹¹⁵ That is more innocents than many a “retaliatory strike.” What kind of “provocation” does our author have in mind? He does not say. But if this has anything to do with U.S. depredations abroad, it almost always concerns something that is, in the vernacular, none of the business of the U.S. government; e.g., Iraq (Paul, 2008).

Switching gears once again,¹¹⁶ this author once again delivers himself of a gem of a libertarian insight that deserves praise and widespread publicity (637): “We are all one big family, and no one within it may usurp the life or freedom of anyone else.” I am not so sure of the “family” business, but the rest of this is pure libertarianism. It is interesting that a statolatrist could make such a statement, when the government is a great usurper of “the life and freedom” of most people. However, he takes back with the other hand what he gives with this one (640): “Though American political liberalism is by no means the same as classical liberalism, the two overlap in their weighting of the moral spheres.” In my view, in sharp contrast, the players in political economy are like a three legged stool: there are libertarians (classical liberals), liberals (leftists, “progressives” as they call themselves nowadays – I see them as socialists, and not of the voluntary persuasion either) and conservatives (fascists, in my view). All three are equidistant from each other. The libertarian appreciates that conservatives join us in (very slightly) favoring more economic freedom than the liberal.¹¹⁷ The libertarian appreciates

that liberals join us in (very slightly) favoring more personal freedom than the conservatives.¹¹⁸ Both are horrid on foreign policy. Where was the supposed anti war left during Obama’s wars? Nowhere, that’s where. This attempt on Pinker’s part to conflate and confuse libertarianism with left liberalism must be resisted, in the interests of accuracy if nothing else.

However, Pinker reverses field once again and utters a pox on both your houses of a libertarian gem (642):

“It was the Harvard-educated best and the brightest who dragged America into the quagmire of Vietnam. ‘Critical theorists’ and postmodernists on the left, and defenders of religion on the right, agree on one thing: that the two world wars and the Holocaust were the poisoned fruit of the West’s cultivation of science and reason since the Enlightenment.”

Magnificent. It is hard to see how any libertarian could have better expressed our meme that left and right are irrational, immoral, and perhaps equally so.

Continuing in this libertarian vein, Pinker (647-648, footnote deleted) goes so far as to channel Hoppe’s (1993B, 1995) argumentation ethics:

“... in real life people can confer, and they can bind their promises with emotional, social, or legal guarantors. And as soon as one side tries to prevail on the other not to injure him, he has no choice but to commit himself not to injure the other side either. As soon as he says, ‘It’s bad for you to hurt me,’ he’s committed to ‘It’s bad for me to hurt you,’ since logic cannot tell the difference between ‘me’ and ‘you.’ Nor can reason distinguish between Mike and Dave, or Lisa and Amy, or any other set of individuals, because as far as logic is concerned, they’re just a bunch of x’s and y’s. So as soon as you try to persuade someone to avoid harming you by appealing to *reasons* why he shouldn’t, you’re sucked into a commitment to the avoidance of harm as a general goal. And to the extent that you pride yourself on the quality of your reason, work to apply it far and wide, and use it to

¹¹⁴ For Pinker’s pro drone sentiments, see text, *supra*, at footnote 7.

¹¹⁵ <http://www.fff.org/freedom/fd0401c.asp>;
<http://www.fair.org/index.php?page=1084>

¹¹⁶ Pinker would make a formidable broken field runner, if ever his interests turned to football.

¹¹⁷ However, a standard bearer of the right such as Romney favors the minimum wage law and defends the Fed.

¹¹⁸ The feminists, however, want to prohibit prostitution and pornography, and Obama’s views on drug legalization leave much to be desired.

persuade others, you will be forced to deploy that reason in pursuit of universal interests, including an avoidance of violence.”

Would that Pinker *consistently* follow through on this keen insight. Then, we would hear no more from him, any more than ever we do from Hoppe (2001A), about the benefits of statist democracy.¹¹⁹

In the next section of his book concerning the supposed increases in our rationality, Pinker allows political correctness to once again cloud his vision (659): “There are bad Negroes and there are good Negroes, just like there are bad white people and good white people. You can’t tell whether a person is good or bad by looking at the color of his skin.”

“Just like”? Is rationality supposed to overlook differences in black and white crime rates? Are all these statistics to be overlooked, ignored, deprecated, without furnishing a scintilla of a reason to do so? And this in the name of rationality? How can we explain the reluctance of cab drivers, pizza delivery men, etc., both black and white, to enter areas such as Harlem, Bedford Stuyvesant, East St. Louis? One wonders whether or not Pinker himself ventures into these areas of an evening? Is common sense to be tossed out of the window, and under the guise of rationality?¹²⁰

Turning on the dime once again, Pinker is nothing if not courageous in the next section of his book. He (662-664) explains our present relative peacefulness on the basis of our increasing intelligence, which is not that courageous, but then avers that this phenomenon is correlated with, caused by, an association with liberalism, and not the left “progressive” variety, but rather with classical liberalism, or libertarianism. Who am I to disagree with such keen insights? I wonder, though, why this does not apply to Pinker himself, who seems

to be rather an intelligent fellow, with very little “moral stupidity” except when it comes to his fetishes for political correctness, democracy, statism, etc. Pinker further burnishes his libertarian credentials when he writes (669): “... the 1960s slogans were right about one thing: there are moments in life when one really should cut loose and do one’s thing. Reason tells us what those moments are: the time when doing your thing does not impinge on other people’s freedom to do their thing.” Does he really, honestly, truly, mean it this time? No. He is a political weathervane, not confined by the niceties of the requirement of non-contradiction felt by us lesser mortals. He merrily zig-zags all through political economy, sometimes a libertarian, at other times a statolatrist, often in between. Ah, the luxury of such intellectual freedom.

Pinker very properly bemoans “economic illiteracy” (664) but three pages later (667) claimed that NAFTA “opened ... up” free trade. Compared to what?¹²¹ But practically in his very next breath he takes an eminently sensible stance (674-675): “Economists tell us that wealth originates not from land with stuff in it but from the mobilization of ingenuity, effort, and cooperation to turn that stuff into usable products. When people divide the labor and exchange its fruits, wealth can grow and everyone wins.” Well, *some* economists say things like this. But others, statists such as Krugman, Keynes, Stiglitz, Samuelson, maintain that wealth emanates from government expenditures. One wonders why a statist such as Pinker tips his hat to free market economists in this case, instead of those, such as he himself at times (markets do not apply to used body parts, etc.) who see prosperity as a result of government interference with the free enterprise system.

Speaking of economic illiteracy, consider the following (679):

“The advantage to a conqueror in gaining a bit more land is swamped by the disadvantage to

¹¹⁹ These brilliant insights of Hoppe (1993B, 1995) are controversial even in libertarian circles (Kinsella, 2002). To see Pinker (647-648) embracing them is nothing short of delightful.

¹²⁰ And what of Pinker’s own non politically correct statements on this matter (see text at footnote 108)? This most recent statement of his comes with particular ill grace given this contradiction

¹²¹ For a critique of the view that this customs union was an example of free trade, see McGee, 1994C; Murphy, 2006; Rockwell, 1995, 1996; Rothbard, 1993A, 1993B, 1993C, 1995; Tucker, 1995, 1996; Vance, 1996.

the family he kills in stealing it, and the few moments of drive reduction experienced by a rapist are obscenely out of proportion to the suffering he causes his victims. The asymmetry is ultimately a consequence of the law of entropy: an infinitesimal fraction of the states of the universe are orderly enough to support life and happiness, so it's easier to destroy and cause misery than to cultivate and cause happiness. All of this means that even the most steely-eyed utilitarian calculus, in which a disinterested observer tots up the total happiness and unhappiness, will deem violence undesirable, because it creates more unhappiness in its victims than happiness in its perpetrators, and lowers the aggregate amount of happiness in the world."

Here Pinker embraces the fallacy of interpersonal comparisons of utility, beloved of mainstream economists.¹²² There are no units of happiness. Even if there were, a silly assumption, there is no warrant for comparing them across persons. For all we know as a matter of science, the pleasure obtained by the rapist is 100 times greater than the displeasure suffered by his victim. The point is, we can "absolutely ... certainly, definitively, entirely, forever, indisputab(ly), irrefutab(ly), undoubtedly, and unquestionably" (666) never know any such thing. Nor do we need to do so. All we need is the NAP of libertarianism to condemn such a heinous practice, no matter *how* much enjoyment the rapist derives from it.

When Pinker is good, he is awfully, awfully good. Put this in your pipe and smoke it, Marxists (684):

"I suspect that among researchers, gentle commerce is just not a sexy idea. Cultural and intellectual elites have always felt superior to business people, and it doesn't occur to them to credit mere merchants with something as noble as peace."

Putting on his foreign policy spectacles, Pinker (691) asserts that it was "appeasement that led to the Second (World War)." Does he mention alternative explanations, let alone confront them? He does not. What are some alternative accounts? Here is one: the U.S. imperialist interest theory maintains that there were more American investments with firms in Great Britain than in Germany right before World War I. Had the U.S. not intervened then, this war would have ended inconclusively, with neither side a clear winner. It would have petered out. However, the U.S. stuck its thumb on the balance, and as a result the Allies emerged victorious. Then came the "peace" with the very punitive Treaty of Versailles, which led to the German hyperinflation of 1923 (Keynes, 1920), which gave rise to eloquent demagogues, which in turn promoted the career of one Adolph Hitler,¹²³ which resulted in his attempt to seize territory lost in World War I, which ended up with the so-called "appeasement."¹²⁴

End of Part II

Proceed with the Part III on the webpage:

http://www.mest.meste.org/MEST_Najava/II_24_3_block.pdf

¹²² In box 1 of the Dilbert cartoon, his boss says: "I'd like to begin the meeting by giving Dilbert some destructive criticism." Continues his boss in box 2: "Everything you do is dumb. I don't know why I hired you." The denouement in box 3, again from the boss: "I feel much more motivated now. If you feel a little bit worse, we came out ahead as a team." January 16, 2012, Scott Adams, Inc. Read that and weep, neoclassical economists, and Pinker.

¹²³ Who might otherwise ended up as a housepainter.

¹²⁴ For more on this revisionist story, see Barnes, 1982, 2004; Fay, 1967; Keynes, 1920; Nock, 2011; Radosh and Rothbard, 1972; Rothbard, 1972, 1989

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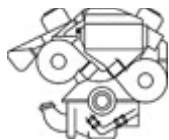
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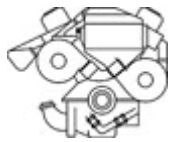
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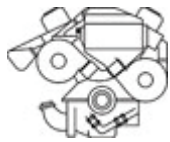
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