

Virtual Firm Competitiveness

Zdeněk Mikoláš, Zuzana Wozniaková

Abstract—In the 21. century it comes true, that competitiveness of the firm is - to a considerable level - influenced by its participation in the chain of suppliers, customers and partners and by the way how the subject cooperates in the chain. This is valid also for new forms of enterprise such as virtual organization or virtual firm. In the first part of the paper there are determined the differences between these forms of enterprise. Another part will bring methodological framework for analysis of the factors, that influence the competitiveness of the virtual organization from spontaneity and order point of view.

Keywords—abstraction, competitiveness, order, potential, spontaneity, virtual firm, virtual organization.

I. INTRODUCTION

CONTEMPORARY enterprise environment is full of quick and profound changes. That is why there arise new requirements for the theory of enterprise and entrepreneurship.

In this turbulent enterprise environment the modern researches will have to accept new facts. Within the context of enterprise competitiveness new century will require not only the final gathering of factors that influence enterprise competitiveness (as the result of research), but the research will have to lead to a new ways that shows *how to measure* an enterprise potential. Outcomes of the researches should contain suggestions of the methods or methodological frameworks which implementation leads to the factors that influence enterprise competitiveness and are valid in a certain instant of time and in certain enterprise environment.

That is why we bring a suggestion of methodological framework that leads to a determination of factors that influence competitiveness of virtual firm in relation to the theory of spontaneous order. This broad issue has been solving under the project of Czech Science Foundation registration number 402/08/HO51.

The aim of the paper is to present new findings from the sphere of spontaneous order and potential in theoretical part and to bring a methodological framework for determining virtual firm competitiveness.

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II. THEORETICAL PART

It is necessary to determine the fundamental theoretical findings when solving the dilemma of competitiveness of virtual firm in relation to the theory of spontaneous order. There are five theoretical spheres that have to be discussed: enterprise potential, networks and clusters, enterprise competitiveness, virtual firm and theory of spontaneous order.

When speaking about entrepreneurial activity we have to mention essential word that gives entrepreneurship clear and understandable content: “potential”.

A. Enterprise potential

Entrepreneurial potential is a difference: the size of deviation of the phenomenon versus what is normal (normal or common phenomenon, etalon, ideal, etc.). In other words potential is the difference between what *is* and what *may* or *must be* the difference between the status quo (current situation or process and a necessity or possibility). Potential is divided into primary – potential as a resource (or requirement) of change and secondary – starting or limiting uncertainty or risks of primary potential (secondary potential regulates the resistance against changes started by primary potential [14]).

The potential of enterprise’s competitiveness is a category of a principal value to compete effectively during a long-time period. A totality of material and non-material resources, which condition obtaining favorable position in global markets is meant by the potential of competitiveness. Its elements (e. g. modern technology) and the way of their relations (e. g. the possibility of obtaining the lowest costs of activity as the result of proper technological solutions) decide of the possibility of competitive supremacy building (resulting from resources, skills) and configuration of available system of competition’s devices (price, quality, distribution)[3].

However there are some differences between global pilot companies and small and medium sized enterprises. How can a small or medium sized enterprise achieve a great potential?

B. Networks and clusters

Small and innovative firms are best placed to pursue global competitive advantage when they choose to operate within industrial clusters. Strategic connections, linkages and partnerships are the key factors that distinguish clusters from other forms of business collaborations [2].

The nature of related linkages – between firms, customers, suppliers, distributors, agencies and across sectoral boundaries – influence the scope and purpose of a variety of entrepreneurial activities and determine the effectiveness of

organizational competitiveness at local, national and international levels [12].

Under the conditions of the Czech Republic, we can define the clusters as groups of independent (alternately collaborating and competing) companies and associated institutions that are geographically concentrated in one or several regions, even though their cluster may have global reach. Entrepreneurial clusters specialize in particular lines of business, be it high-tech or traditional industries.

While clusters and networks are certainly distinct, it was observed that clusters, especially cluster support organizations very often carried specific network characteristics. Entrepreneurial networks are defined as formal and informal organizations that facilitate the exchange of information and technology and foster various kinds of coordination and collaboration in a cluster, for example chambers of commerce, trade associations or alumni networks of schools and companies [1].

C. Enterprise competitiveness

Many authors wrote a lot of information about enterprise competitiveness. We can separate them into three basic groups.

In the first group – group of *marketing orientated theories* there is the most widely known Michael Porter's Five Forces of Competitive Position model [20]. This model provides a simple perspective for assessing and analysis the competitive strength and position of a corporation or simply enterprise. Porter's five forces model shows that enterprise competitiveness overcomes a usual borders of the organization.

Author J. Jirásek brings the model of forces, that effect on competitive strategy and divides these forces onto two groups: external forces and internal forces [5]. The main progress in this theory is connecting enterprise competitiveness with potential. According to this author enterprise competitiveness is composed not only of internal capabilities, weaknesses and strengths, but also of following factors: growth and restrictive factors, potential of external rivalry, influence of the state, local autonomy, banks, customers, subscribers, potential of new products, potential of new competitors, suppliers, stakeholders and employees.

When speaking about enterprise competitiveness, we have to mention Porter's Generic Strategies. Firm's strengths ultimately fall into one of two headings: cost advantage, differentiation and focus [19].

Philip Kotler defines four competitive positions and strategy for each of them [9]. But there exist another group (spheres) of theories of the company competitiveness such as *theories focused on output*. Many technical papers bring methods and techniques that should lead to an increasing competitiveness of the organization for example SWOT analysis, financial analysis, EVA theory, Benchmarking, the Boston Matrix, the GE matrix etc.

The third group of theories of competitiveness contains methods that overcome usual economical thinking. The Balanced Scorecard method of Kaplan and Norton [6] is a

strategic approach that provokes a lot of attention. This method is fundamental for forming modern strategy of competitive potential and dynamic enterprise development. But there are another interesting approaches.

Zdeněk Mikoláš (Department of Business Administration, Technical University of Ostrava) brings Model IDINMOSU that overcomes a usual economical thinking.

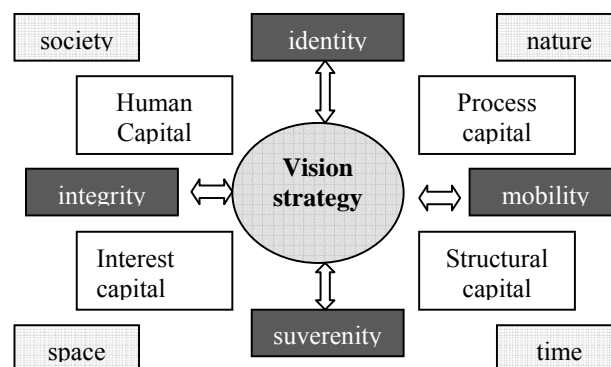


Fig. 1 Scheme of model IDINMOSU

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Fig. 1 shows a group M that includes the basic inside attributes of a firm competitiveness (L – human potential, F – financial potential, P – process potential, O – trade potential). These attributes results from transformation of external sources (Z1 – space, Z2 – time, Z3 – nature, Z4 – society) in the context of vision and strategy (VS), then $M(L, F, P, O) = f(VS, Z1, Z2, Z3, Z4)$. It means transformation of the initial (primary) objective potential (L, F, P, O) and primary subjective potential of enterprise (human ingenuity expressed as VS). Globalization, new scientist findings, digitalization etc. causes the development of an enterprise leading to higher orders, that means “the second negation” mentioned competitiveness potentials. A set D includes a new dimension of competitiveness (Y1 – identity, Y2 – integrity, Y3 – mobility, Y4 – sovereignty). Formally written:

$$D(Y1, Y2, Y3, Y4) = g(VS, Z1, Z2, Z3, Z4, M(Z1, Z2, Z3, Z4)) \quad (1)$$

Refer to “(1)” we can see that the process of forming the firm potential begins by complicated multiple transformations of the primary potentials and a human craft. On the basis of particular entrepreneurial vision and strategy the process of forming the potential continues by transformation of external potentials (sources) of the firm. Subsequently the potential is developed into other followed levels of competitiveness potential. For the firm being able to compete it has to be *identifiable* by the competitors, it has to be strong and resistible in its compactness it means *integrity* is has to be flexible in its reactions it means *mobility*, it has to be *sovereign* it means independent in its existence [15].

Prime subjective enterprise potential (vision and strategy) is fundamental for each organization no less for modern form of enterprise such as virtual organization.

D. Virtual Organization and virtual firm

The word “virtual” became in the last years very frequented expression. It is used in many contexts and applied in many situations where we can see many interpretations. It can lead to a situation, when meaning of this word is lost and finally the word “virtual” become an empty word. That’s why we bring a short analysis of the merits of this word.

On the basis of the dictionary and word-book study we see at least three dimensions of this word. The *first dimension* is speciousness. Virtual means speciousness, existing only as the fictive picture of reality. Virtual picture is unreal image. [8].

The second dimension of the word “*virtual*” is relating to virtual reality (virtual adventure, virtual travelling). Virtual reality is reality simulated by using a computer technology. It is concerned with simulated interactive background. For reaching the best realistic participant perception it is usually used a special input and output equipment (e. g. stereoscopic glasses)[13, 21].

The third dimension of the word “*virtual*” is potential. In Latin this word means possibility, ability, internal force etc. [10].

On the basis of the dictionary and word-book analysis we can make own definition of the virtual firm: *virtual firm uses computer technology; create a virtual (speciousness) image in virtual reality. On the ground of these and other facts virtual firm potential can quickly reach exponentiation.*

Virtual organization according to available literal resources

The notion “*virtual organization*” originates from Abbe Mowshowitz. He defined a model of virtual organization and emphasized that this type of organization is established in order to achieve an objective and after that it ends. Virtual organization is founded on the separation of requirements, for example, inputs such as components, from the ways in which requirements are met, or satisfiers, for example, suppliers and distribution networks.

Separating these elements allows managers to switch easily from one way of meeting a requirement to another, by, for example, laying off higher-paid workers in the United States and hiring cheaper labor overseas or south of the border. Used systematically, switching brings huge increases in productivity, provided that transaction costs are held in check. The price of this increased inefficiency is that, practiced regularly, switching weakens personal, political, and business loyalties. Absent a sense of loyalty to persons or places, virtual organizations distance themselves: both geographically and psychologically: from the regions and countries in which they operate. This process is undermining the nation-state, which cannot continue indefinitely to control virtual organizations. A new feudal system is in the making, in which power and authority are vested in private hands but which is based on globally distributed resources rather than on possession of land [17].

According to another authors a virtual organization can be both: short time or permanent group of geographically dispersed individuals, groups, organizational units that do not have to belong to one firm or organization or it can be one organization that depend upon electronic interconnection [18].

Some authors emphasis too much an importance of computer technology at virtual organizations. This technology is important, but it can not be considered as principle (fundamental). If the firm is based on holding the informational technology and in the firm we have knowledge workers, but we will not find market opportunity, the base will be unused.

According to Štefan Kassay a virtual firm has analogy in virtual memory in computers: it is memory which starts right in time when it is necessary and when it is possible to use it efficiently [7].

Virtual organization vs. virtual firm

Value chain is a set of all firm activities that leads to a value that is provided to a customer. In the sphere of information technology it leads to a virtual organization, because communicating, self-controlling adapting and learning system can be inside its environment considered as entity. It is system that qualitatively overcomes separates component parts of value chain and it is determined against its environment. This type of organization can be usually found in production sphere and mostly it is a part of final production. It is not necessary to be under one firm.

On the other hand virtual companies can be established top-down – purposely as one firm using maximally outsourcing and its specific organizational knowledge on the basis of informational technology. These companies can be seen in the sphere of e-commerce, B2C, IT, entertainment industry, media and communication.

These virtual firms are often established to make the best of only one opportunity (one project). Virtual firm structure is centralized and the project realization is based on suppliers [11].

In this context we have to mention Kevin Kelly. He considers virtual firm as shell of appropriate processes. If we go and want to find it, we do not find anybody, because nearly all activities are managed by suppliers [4].

According to Zdeněk Mikoláš there exist several points of view. One of them is a level of abstraction (reality – abstraction). *The first level of virtualization* means that above real (materialized) enterprise there is virtual firm displayed. Practically the first level of abstraction can be considered as creation of a firm website. *The second level of virtualization* means that real enterprise is complemented by nonmaterial virtual part. According to a type of activities realized in virtual part we can distinguish virtual activities such as: selling by using a virtual catalog, services provided by using a virtual background (e. g. reservation of a chosen hotel, payments by using internet etc.) and last but not least administration activity such as virtual office. Not only a world depression but another reasons leads entrepreneurs to use virtual office. *The third level of virtualization* means fully nonmaterial virtual entrepreneurship. It is usually realized by transnational

corporations or firms working in the sphere of information technology. Not only level of IT development influences this fully nonmaterial entrepreneurship, but also offshoring [16].

In these enterprises there is necessary to keep order, because the most parts of this firm do not physically meet each other. So that control is difficult and there can appear a great amount of spontaneity.

E. Spontaneity and order

Not only a virtual organization, but each enterprise can be seen as a spontaneous order, because we can not say that enterprise is result of order (negentropy) and at the same time we can not see enterprise as a result of entropy.

F. A Hayek concerned with the theory of spontaneous order. He divided phenomena into three groups. The first type of order is natural and is connected with the natural laws. The second order results from human planning and action whereas the third order arises from human action but is not specifically planned by men.

But Z. Mikoláš develops theory of spontaneous order by changing some important facts on the basis of his own empirical findings [15].

		ORDER (negentropy)	
		OBJECTIVE	SUBJECTIVE
SPONTANEITY (entropy)	OBJECTIVE	3	4
	SUBJECTIVE	2	1

Fig. 2 Types of order and spontaneity in entrepreneurship

According to this author there exist three groups of phenomenon:

- Controlled (number 1 in fig. 2),
- Controllable, but not controlled (number 2 and 4 in fig. 2) and
- Uncontrollable (number 3 in fig. 2).

Fig. 2 shows the relation among the phenomena and types of orders. Subjective spontaneity and subjective order are connected with a human being, with a human factor. Objective order and objective spontaneity are hardly influence able. Spontaneous order can be seen as number 2 in fig. 2 and means that exists a particular level of spontaneity and this coexists with a particular level of order so that entropy and negentropy together aggregate a complex.

We can not say that enterprise results only from order, but at the same time we can not say enterprise results only from entropy (chaos). But there exist certain percentage of spontaneity and order.

III. FACTORS INFLUENCING VIRTUAL FIRM COMPETITIVENESS

Within the scope of solving the project under the Czech Science Foundation called *Optimization of Multidisciplinary Designing and Modeling of the Virtual Firm Production System* we had to suggest the process of finding the factors that affect the virtual firm competitiveness. Our suggestion is following.

Methodological framework for selecting the competitiveness factors will result from model IDINMOSU. In the first period there is necessary to define the competitiveness factors for the real firm on the basis of:

- desk research type A: define the competitive factors for real firm by using results of the done researches (authors Pollak, Kislingerová, Bobák),
- desk research type B: define competitive factors specific for virtual firm by using the findings presented in literature resources.

In the second period there is necessary to realize evaluation of gained competitiveness factors in the view to virtual firm relevancy. We used followed scale:

- AAA - very important factor for virtual firm
- AA - important factor for virtual firm
- A - factor of small account (for virtual firm)
- 0 - irrelevant factor for virtual firm

The first evaluation was suggested by the authors of this paper and then the verification was done at three levels:

1. level verification: selected group of inceptors (Technical University of Ostrava),
2. level verification: group of associate professors from two other universities (Tomas Bata University in Zlín – Czech Republic, University of West Bohemia in Pilsen).
3. level verification: group of managers working in virtual firms.

In the third period we suggest to realize synthesis of the results with the aim getting the final list of competitiveness factors for the virtual firm.

Then in the fourth part these factors will be inscribed into square matrix. Here we can realize analysis of cause and ratio analysis by using the 0 – 1 number system. After that we work out mathematical – economical model of the system of virtual firm. We use interlacing model especially input – output analysis. This matrix is defined by 200 factors and that's is why we have to realize decomposition of the system. The aim is to focus on the production system. This contains 13 factors of the virtual firm competitiveness. Now we have square matrix. We suppose, inputs equate outputs but the world of enterprise is full of spontaneity and that is why we have to involve spontaneity.

Another phase of the research is simulating the entropy (or spontaneity) in such defined system. Interlacing model uses technical coefficient to solve this problem. In another phases we experimented with real data and found out these results. This interlacing model is useful for academic and theoretical cases, but in practice unusable.

At this time we are at the fourth phase of the research and are still continuing according to the mentioned suggestion. But at this level of knowledge, we can make another result.

There exists a particular order in spontaneous process of firm (system) morphology. Units that are closer to the merit share a great amount of order coming from the merit. On the other hand units situated farther from the merit underlie spontaneity. Each organization (not only virtual organization) is structured on the basis of spontaneity order. The merit is formed from technological fundament of organization (enterprise), which defines its existence with the relation to profile and field of production (or services). Closed to the merit, there are situated essential system elements focused on coordination, controlling and system reproduction whereupon there start process of forming the structure connecting merit with inputs and outputs. It is clear that elements formed at the edge pulsate (oscillate) between the system structure and environment as we know it from the enterprise networking or outsourcing.

However new century requires a new results coming from recent researches, we have to accept the fact that not only particular outcomes are required, but what more: a new methodological frameworks are still more useful. Each outcome is valid for certain time in certain space. But methodological frameworks can be used nearly anywhere and anytime.

REFERENCES

- [1] *Business clusters: Promoting Enterprise in Central and Eastern Europe*. OECD Publication, Paris (France): OECD Publishing, 2005. Part II: Cluster Country Case Studies: MIKOLÁŠ, Zdeněk. Czech Republic. ISBN 92-64-00710-5.
- [2] CAMAGNI, Roberto. *Introduction: from the local milieu to innovation through cooperation network*, in R. Camagni (ed.), *Innovation Networks: Spatial Perspectives*, London: Bedhaven Press, 1991.
- [3] FUDALIŃSKI, Janusz, MARKIEWICZ, Piotr. *Intangible Assets as a Part of the Competitive Potential of an Organization*. Ostrava (Czech Republic): Repronis, 2003. ISBN 80-7329-036-7.
- [4] GIBSON, Rowan. *Rethinking the future: rethinking business, principles, competition, control, leadership, markets and world*. London: Nicholas Brealey Publishing Ltd, 1999, Edited by Rowan Gibson Paperback, 288 pp. ISBN: 1857881087
- [5] JIRÁSEK, Jaroslav. *Konkurenčnost : vítězství a porážky na kolbišti trhu*. Praha (Czech Republic): Professional Publishing, 2001. ISBN 80-86419-11-8.
- [6] KAPLAN, S. Robert, NORTON P. David. *The BSC: Translating Strategy into Action*. Harvard: Harvard Business School Press, 1996. ISBN 0875846513.
- [7] KASSAY, Štefan. *Organizační rozvoj korporací*. 1. Vyd. Nové Zámky: Strateg, 1999. pg. 164. ISBN 80-967919-5-8.
- [8] Kolektiv odborníků z předních vědeckých a pedagogických pracovišť. *Všeobecná encyklopedie ve čtyřech svazcích. Díl 4, Ř – Ž. 1. Vyd. Praha (Czech Republic): Nakladatelský dům OP, 1998. S. 717. ISBN 80-85841-17-7 (soubor). 80-85841-37-1 (sv. 4).*
- [9] KOTLER, Philip – KELLER, L. Kevin. *Marketing management*. Prentice Hall, 2005. ISBN 9780131457577.
- [10] KRAUS, Jiří a kol. *Nový akademický slovník cizích slov A – Ž. 1. vyd. Praha: Academia, 2005. ISBN 80-200-1351-2.*
- [11] KUŘITKA, Ivo – FOTIJEV, Pavel. *Stabilita virtuálních organizací rozvoj managementu. In Festive Scientific Conference on the Occasion of 15th Anniversary of the Establishment of Faculty of Business and Management, Brno University of Technology, Czech Republic. Brno: University of Technology, 2007. ISBN 978-80-214-3482-0. S. 230 – 237*
- [12] LÉO-PAUL DANA *Handbook of Research on International Entrepreneurship* Cheltenham: Edward Elgar Publishing Limited, United Kingdom, 2004. ISBN 1-84542-655-X.
- [13] MARTINCOVÁ, Olga a kol. *Nová slova v češtině: slovník neologismů*. 1. Vyd. Praha: Academia, 1998. ISBN 80-200-0640-0.
- [14] MIKOLÁŠ, Zdeněk. *Entrepreneurship, Theses and Questions at the Beginning of the Third Millennium*. Kraków (Poland): Victoria, 2002. ISBN 83-918127-4-X.
- [15] MIKOLÁŠ, Zdeněk. *Jak zvýšit konkurenceschopnost podniku: konkurenční potenciál a dynamika podnikání*. Praha: Grada, 2005. ISBN 80-247-1277-6.
- [16] MIKOLÁŠ, Zdeněk. *Podnikání a podnik B*. Studijní opora. Ostrava, Czech Republic, VŠP, 2006. ISBN 80-86764-54-0. pg. 131 – 135
- [17] MOWSHOWITZ, Abbe. *Virtual organization: Toward a Theory of Societal Transformation Simulated by Information Technology*. New York: Greenwood Pub Group, 2002 ISBN: 1567205011.
- [18] PAPAZOGLU, Michael – RIBBERS, Piet – TSALGATIDOU, Aphrodite. *Integrated value chain and their implications from a business and technology standpoint. Decision Support Systems*. Holland: Elsevier, 2000. Vol. 29, number 4, ISSN 0167-9236. Pg. 323 – 342.
- [19] PORTER, E., Michael. *Competitive Advantage: Creating and Sustaining Superior Performance*. New York (USA): Free Press, 1985. ISBN 0-684841460.
- [20] PORTER, E., Michael. *Competitive Strategy: Techniques for Analyzing Industries and Competitors*. New York (USA): Free Press, 1998. ISBN 0-684-84-148-7.
- [21] VITOVSKÝ, Antonín: *Moderní slovník softwaru: výkladový anglicko-český a česko-anglický*. 1. vyd. Praha: AV Software, 2006. ISBN 80-901428-8-5.



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