ENTERRPRENERSHIP IN NETWORK MARKETS

Irina Strelets

Moscow State Institute of International Relations (MGIMO-University),
Moscow, Russia
E-mail: i_strelets@hotmail.ru

Abstract: Network analysis is one of the most popular methods of scientific research at present. The aim of the topic is to examine the specific features of entrepreneurship in network markets. Network goods are those goods which meet the following characteristics: complementarities; high economy of scale; network externalities; lock-in effects. These characteristics of network goods and network markets give some advantages and form some new problems for enterprises: prices, legislation problems, etc. Advantages: information and information exchange; flexibility; development of non-commercial organisations; social contacts. Problems: contradictions in the information; complexity of economic life; protection of information; price-decisions; legislation. It is important to construct the most effective business model, which is capable to be competitive and cooperative in the network markets.

Keywords: network analysis, network markets, network externalities, lock-in effects, path dependency, spillover effects.

1. Introduction

Network goods have become a very often-researched subject of scientific works recently. We would like to pay attention to the specific features of network goods and to their principle difference from traditional goods as well as to those advantages and disadvantages they give to SMEs.

The object of the research: a firm in the network economy.

The goal of the research: to show some new advantages and disadvantages of the network space for SMEs.

The methods applied: institutional analysis.

In our article we apply to sociological works on network analysis by D.Knoke, P. Marsden, S.Wasserman, B.Wellman, etc. We also apply to the works on network economic analysis by M.Castells, O.Shy. In the analysis of information and information rationality we pay attention to some works by H.Simon and K.Arrow. While examining lock-ins and switching costs as well as some special characteristics of network markets works by J.Farrell, P. Klemperer, Shapiro C.and Varian H. are of particular interest. We use Information Economy Report 2007-2008, United Nations as a data basis for the research.

2. Network researches and network economy

Network analysis origins from sociology works written in the end of XXth century (1). Methodological potential of network analysis is very high since it gives the possibility to describe the relationship between households and firms in the most rational way, to operate data as on the micro, as on the macro level. That's the reason why network analysis in sociology has created the basis for developing socio-economic and economic network researches. Network methodology gives the opportunity to conduct interdiscipline analysis.

Mr. M.Castells calls our modern global society "the society of network structures", emphasising on the one hand their universal character, and on the other hand their determining character, when the power of a structure proves to be stronger, than the structure of a power, and the fact of one's belonging to a certain structure becomes the most important origin of power and changes in a society (2). Networks are considered as structures, contributing to the development of a number of spheres, and leading to the globalisation of the world economy in the end.

A network as a decentralized controlling system becomes more and more important.

While discussing the globalization of the world economy, one may very often come across the statement that the globalisation itself is not a new phenomenon, since the world has been global all the time. Sometimes there are references even to the Ancient Rome, under the aegis of which there was the most part of the antique world; to the medieval Hanseatic League, and to different global ideas, occupying the human society from time to time.

But the main specific feature of the modern globalisation is its global, in fact universal, nature; involvement of the world society into the open system of political, social, financial, economic and cultural connections based on the up-to-date communication and information technologies. The world has been always global in the physical sense, since it has represented a single whole - a physical foundation of the world civilisation. But in information and communication terms at the present stage of its development the world is just approaching the genuine globalization. During the century's connections between different parts of the world used to be occasional and chaotic. Regular relations between Europe and non-European civilisations began to form only after the greatest geographical discoveries. But nevertheless the world was still a totality of nation-states till the XXth century, when the Westfalen System with its principal of national sovereignty climaxed in its development. Today the Westfalen System is at last being overcome with a truly globalised world being formed. Communication possibilities emerging thanks to the development of the communication facilities and Internet technology became the precondition of this process and diminished the costs of the information transmission at personal, production and international levels.

Networks are playing an important role in this process.

Firms built their internal and external connections on a network principle, and these processes take place in different cultural and national contexts. Network economy is of great importance at present.

Network goods should be determined through their characteristics:

- Complementarity
- High economy of scale
- Network externalities
- Lock-in effects

Complementarity means that consumers in network markets buy the goods which may be used with other goods of the network. In this way consumers buy not separate goods, but parts of a system, of a network. It is of great importance that the goods work on the same standard.

The cost structure of network goods differs from the one of traditional goods: the biggest part of the costs applies to the initial stage of the production process, but the further copy process costs very little in comparison with the initial costs. That means that a firm may have a very high economy of scale in network markets.

Network externalities cause the rising utility for consumers: every additional user enlarges the utility of a network for other consumers. The demand curve looks differently. The readiness to pay rises with the rise of the number of consumers. But after a certain moment the readiness to pay goes down, since all those who were ready to pay more for joining the network have already done it. That fact means that the network has reached its optimal size.

The main problem is – what size of a network may be looked upon as an optimal one? What size of a network should be considered a critical mass – a size of a network when joining it gives advantages to consumers? And if there is no critical mass yet, can we create or imitate it ourselves thus producing network externalities?

If we speak about network goods we should take into consideration lock-in effects. These effects mean forming of some behavioral stereotypes making it difficult for consumers to change producers. There is a possibility of forming institutional lock-ins, path dependency effects, etc (3).

Network markets are everywhere. Internet services, banking services, transport services, etc. Network effects are used in Christmas effects, network marketing, network advertising.

The number of Internet users is growing, and we notice the most rapid dynamics of this growth in transition economies.

Table1. Internet users by level of development and region

	2005	% Change 2005-2006	2006
World	**1 006 429 544**	**12.4**	**1 131 078 697**
Developed economies	**529 869 769**	**6.8**	**566 077 247**
Asia	86 975 900	2.8	89 439 100
Europe	205 089 269	10.7	227 077 547
North America	220 860 600	4.6	231 060 600
Oceania	16 944 000	9.2	18 500 000
Developing countries	**433 560 239**	**17.9**	**511 035 250**
Africa	33 032 605	31.4	43 397 500
Asia	311 164 987	16.1	361 391 800
Latin America and the Caribbean	89 022 947	18.9	105 864 150
Oceania	339 700	12.4	381 800
Transition economies	**42 999 536**	**25.5**	**53 966 200**

Information Economy Report 2007-2008, United Nations, New York and Geneva, 2007. P.26.

The resembling situation is with mobile subscribers.

Table2. Mobile subscribers per 100 populations worldwide in 2002 and 2006

	Subscribers per 100 pop.		**%** change
	2002	2006	2002-2006
Developing economies	11	29	179
Africa	4	21	356
Asia	11	28	162
Latin America and the Caribbean	19	53	183
Transition economies	12	69	479
Developed economies	64	91	42
World	19	41	116

Information Economy Report 2007-2008, United Nations, New York and Geneva, 2007. P.245.

Table3. Growth in the number of mobile telephone subscribers worldwide, 2001-2005

	Subscriptions 2001	**Subscriptions 2005**	**% change**
Developing countries	388 674 941	1 167 050 600	200.26
Africa	26 091 686	134 296 038	414.71
Asia and Oceania	278 511 819	793 375 236	184.86
Latin America and the Caribbean	84 071 436	239 379 326	184.73
Transition economies	22 325 131	185 068 576	728.97
Developed countries	553 610 317	804 830 507	45.38
World total	964 612 390	2 156 951 688	123.61

Information Economy Report 2007-2008, United Nations, New York and Geneva, 2007. P.244.

Modern SMEs work under the conditions of great flows of different sorts of information and they should operate this information in a proper way.

In the modern economy sometimes it is necessary to create a network or to become a member of a network for getting profits.

Specific features of network markets produce some special advantages and problems for the firms working in such markets.

3. Advantages and Disadvantages of network markets

First of all, we should say a few words about the transformation of the political system under the influence of the information processes. At a certain time the appearance of effective mass media played an important role in the formation of democratic states; we mean periodicals, books, and radio and TV a little bit later. Mass media diminish transaction costs of collecting the information and provide the deliberate participation of wider circles of the population in the political life of a society. During the past period a democratic nation state was created.

But a habitual model of democracy has been being gradually changed. The appearance and the development of Internet give the possibility to an unlimited number of persons to have an efficient access to a grate volume of information. Every citizen receives a possibility to turn to an unlimited auditorium, bearing almost zero costs. Some supporters of "teledemocracy" and "cyberdemocracy" appear. These conceptions mean, that more and more problems are solved on the basis of referendums, minimising the populist effects of the "plebiscite democracy". So the ideas of creation of an effective civil society meet a necessary material basis thanks to the modern technologies. And the process of "electronic democratisation" overcomes national borders and becomes universal.

Political shifts determine further economic development, and we should pay attention to those main features connected with the spreading of economic and financial information as the next important sphere of the influence of information processes on the globalisation of the world economy

Internet network and co-systems and technologies make information on markets and prices worldwide increasingly more available for potential market players. The world market -

being to some extent an abstract category - turns into a reality. A vivid example is mail-order trade via television or Internet, successfully operating in many countries.

New economic forms have been being built around global network structures, and access through such networks to knowledge and technological skills becomes considerably easier. The world economic system is becoming still more "transparent". Capital is either global from the very beginning, or becomes global in the economy, forming around electronic networks.

The share of financial data is increasing. The development of Internet-technologies facilitates this process and creates a basis for the more efficient transmission of financial information. The information potential may be realised with maximum efficiency under the condition that the communication structures, mostly corresponding with new communication systems, have been worked out. These communication structures could lead to the possibility of distributing information flows at the optimum level.

In this case it is very important that the information exchange systems are formed beyond national and regional borders. Other more traditional forms of international cooperation (joint ventures, strategic alliances) carry limited possibilities for information exchange, while virtual networks allow it to be overcome. At present we witness international networks, which rapidly and successfully develop under the conditions of globalisation and the new information space. A total information space is being created. This space gives a number of positive externalities to those with access to it, and there are a lot of potential possibilities for its replenishment and quality improvement. Thus there is a possibility that the renovation of the information bank of a network may lead to the multiplication of positive externalities. MPS in thos case is probably a percentage of closed information.

Besides financial and economic tasks, modern conditions of the economic space promote the development of international non-commercial organisations. The development of new means of communications has led to the possibility of creating and increasing the influence of different transnational non-commercial institutions. In future such organisations may undertake to solve a number of global problems and will be a serious, workable alternative to government mechanisms for solving similar problems.

One of the most significant effects of the influence of information over the process of globalisation is the enlargement of cultural connections between people from different regions and of different national traditions. Modern communication means (Internet, satellite television) provide every person with potential links to every other person, regardless of location or the distance separating them. Such possibilities create the basis for the formation of common cultural values and destroy widespread stereotypes. A modern person has an access to a large pool of information concerning behaviour models, culture and life styles, different from those, which are peculiar to his native environment. A modern person has better opportunities to evaluate these questions on his own, obtaining information more directly. So there is an interaction and an interconditionality of different cultures and this process is becoming still easier and more available as more means of communication emerge.

Thus, we can establish a general positive tendency of the influence of the information process over the globalisation of the world economy, permeated by all the aforementioned factors. This tendency means the overcoming or the softening of the asymmetry of information, the increasing of the volume of information available to a large number of people. Against this background, tariffs for communication services are being reduced worldwide. This tendency is supposed to continue in the near future and, according to some predictions, this reduction may even take the form of a dramatic drop in prices.

Now we shall turn our attention to some problems, arising in the process of globalisation of the world economy in connection with the broadening of the information space.

It is well known that very often a positive phenomenon gives rise to its reverse, resulting in some negative consequences. This is totally applicable to the informatisation of the society. We have already considered the fact that the information has become wider and more available for many people. But this great volume of information creates certain difficulties as well. Information volume continues to grow, and the inevitable contradiction arising at its origins creates contradictions in the information itself. Sometimes it is difficult even for specialists to deal with such information, not to mention ordinary people. Mr. Herbert Simon, in his article "Rationality as Process and as Product of Thought", points out that information is of clear benefit only in a world, where there is a lack of information. However, he argues, where there is an information surplus it begins to play a negative role, drawing us away from something significant; in such circumstances, the real good is not the information, but attention (4).

All this is accompanied by the considerable complexity of economic life, and again on a global scale. Multinational corporations and banks evolve, the financial sphere broadens, exchange mechanisms become more complicated, etc. Today, the difficulty is not in receiving information, in treating it in a qualified way.

There are some difficulties in creation and further development of a network structure. It's forming demands a formation of information flows between participants of that economic process for which it is being created. In this connection it is necessary to provide a rapid access of new participants to the existing information resources, a rapid setup of all participants to new information materials, a rapid construction of direct multilateral, mainly horizontal connections between participants. All this may be achieved with many difficulties.

There is a problem of protection in network markets. On the one hand it is necessary to provide an effective protection of the goods, but on the other hand if we exclude non-legal users we may loose a part of the network's utility, since the number of users enlarge the utility of the network (5).

Another important problem is price-decisions. Modern technologies drastically modify market relationship. Some economists say that the situation looks like a perfect competition: minimal transaction costs, free access to information, low prices. But the rising utility of a network makes us think over a possibility to raise prices for network goods. High economy of scale diminishes the role of costs in price decisions. That means that the importance of supply in price decisions will fall, but the importance of demand in the process will rise.

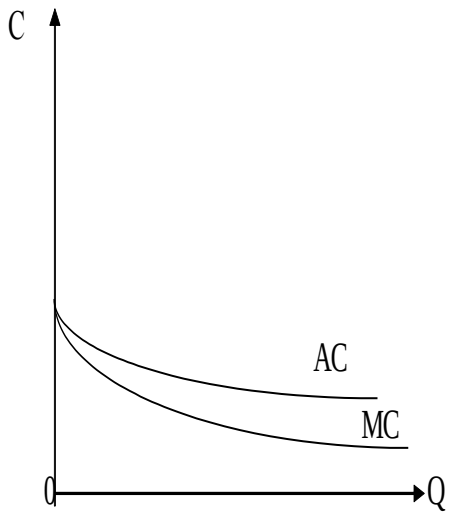

Fig.1. Structure of costs of network goods

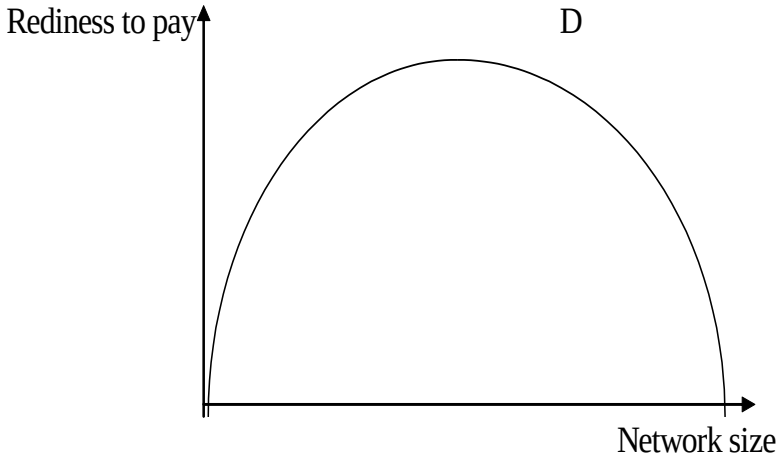

Fig.2. Demand for network goods

The above-mentioned lock-in effects may also influence price decisions. For example great switching costs may make consumers stay in the system in spite of the fact that prices in the system are at high level. In his turn a producer may difersify goods and services inside the system creating a chain of short-term contracts, supporting high prices for certain goods. J.Farrel and P.Klemperer examine a special kind of equilibrium with switching costs, which differs from a classical equilibrium (6).

So standard demand-supply models may turn out not effective in network markets.

Another difficult problem is legislation. It often does not meet the demands of network markets.

A question concerning the influence of network markets is of great interest. This influence is very provocative.

On the one hand some spillover effects may promote the development of other industries. To some extent spillover effects may be looked upon as characteristics of network goods.

On the other hand network markets produce many problems for other industries. Network structures may cause negative selection, competing with qualified but weak non-network goods. Lock-in effects may promote old and not effective decisions. On a social level there is a possibility that we begin to choose not information but an origin of information.

The development of information and communication technologies influence social aspects, and this influence is not always positive. Mass media bring down an avalanche of information over people, and this information is very difficult for processing. It is appropriate to remind of Mr. A.Toffler's ideas. Within a constant movement from one working place to another, from one domicile to another people loose the capability to think on their own, they have no time to "settle down". At present, in the conditions of the enforcement of the globalization process, these tendencies become stronger.

Emphasising positive aspects of informatization, we have already mentioned that it expands the connections between people of different cultures. But there is an opposite side of the process, when traditional group connections are excluded by functional information connections, which will entail mutual alienation between people. Strange as it may seem, in the epoch of global changes and intercommunication of cultures centrifugal forces may be stronger than centripetal forces.

Factors of formation of a human personality change, as well as motivation and vision of world. Potential cognitive abilities together with mental outlook make people socially withdrawn. All these processes are not inoffensive while their influence on the human psychology.

It is necessary to pay particular attention to the asymmetry in the access to the information for different countries. The differences in material and educational level don't give equal opportunities to all members of the international economic space. But the process of the information development goes on with increased speed, that's why the gap in the provision with information is getting wider.

The instability in the intercommunication world becomes stronger; the tendency to the growth of social contradictions in connection with the difficulties of adaptation to new technologies is actual even for most developed countries. All these problems have arisen inevitably and are the consequence of the strong process of globalisation of the world economy. We should use some global mechanisms (international organisations, international talks), corresponding with the scale of the problems, to solve the problems.

It is time to take serious decisions on restructuring enterprises, public institutions, and administrative organisations. Applied researches are getting more urgent in the process of controlling network structures, the investigation in the motivation and psychological peculiarities of their participants, the foundation of a new corporate culture.

4. Modified Firm's Behavior

IT has drastically changed the process of decision taking by economic subjects. Consumers' behavior is changing, so is the one of firms. Maximized utility evidently remains its basis (from the point of view of orthodox-edge neoclassic principles), but the aim is realized otherwise: microsubject turns into active IT-user. We suppose to consider the ongoing changes at the firm's level highlighting specific features of its activity against IT background.

Many years ago Ronald Coase, a prominent American economist, put the following question 'Why do firms exist?'(7) The answer is that the firm allows decreasing transactional costs of the market coordination. If 'spontaneous order' saves transactional costs in volume of big groups, than hierarchy achieves the same outcome in volume of small groups that is within the firm's structure. Modern IT allows decreasing transactional costs in many fields of the economy nearly to zero. It implies transactional costs connected with search for suppliers and buyers, selection of specific and interspecific resources and settlement of many other problems, which earlier required much more time and money.

Internet wields today so great influence on the firm's activities that network possibilities are considered not as a competitive advantage, but as an essential prerequisite for doing business at the modern level, which is compliance with the world concept of the firm's qualified activities. K.Kelly illustrates this idea as follows: 'In the network economy the main objective of the firm is not maximized value of the firm, but maximized value of the firm's network' (8).

In the firm's activities the Internet is still playing more important role as a network of networks. First, a company uses it only as one more marketing channel, than the Internet is beginning to be used to bring together all economic subjects, eventually transformation of the company is taking place, when many business processes are totally automated.

The new term 'information proficiency' of the company has been coined. It implies the ability of the company and the one of other institutions efficiently and systematically uses information to attain strategic objectives, a method to combine skills of the company with those advantages provided by electronic ways of exchange [9]. To become electronically profitable the company has to pursue a well-thought-out information policy, clear-cut information priorities, corporate culture covering information aspects, and finally highly qualified personnel able to perform tasks connected with information.

Modern studies show that the most competitive firms are those that are able to constantly improve themselves on the basis of technological innovations and introduce them. The idea of

learning-by-doing aimed at getting a competitive edge is widely being spread. K.J.Arrow, an American economist, was the first who set out the concept of learning in the course of production (10). It is a well-known microeconomic phenomenon at the level of a single firm. Its gist is that with production or investment process being performed in some particular field, a kind of skills that Arrow calls 'lessons' based on the aggregated experience are formed. They form competitive advantages for firms. So far such skills are substantially confined to accumulating organizational experience enabling to make use of more flexible management forms and thus to rapidly solve production problems at less transactional cost.

I.Nonaka, a Japanese economist, calls attention to the necessity to form the so-called 'knowledge-creating company', i.e. a company which can fast produce new and up-to-date methods of control and management by introducing cutting-edge technologies that provide tight communication links between different company units and 'common cognitive base' for interaction of the company's employees (11).

In his other work co-authored with H.Takeuchi, I. Nonaka maintains this argument and underlines that vertical hierarchy, considered to be the most efficient management system in the industrialized society, is losing its importance in today's circumstances. The problems are getting diversified and many-dimensional with communication with inferior layers getting less flexible. The bureaucratic structure operates well in a stable environment as being highly formalized, centralized, intended to standardize the working process, it perfectly conforms to tasks of a wide-scale production and, thus, it successfully operates in stable and mature sectors characterized by mainly rational and repeating types of activities. But bureaucratic control may suppress initiative and burden the company in periods of rapid change (12).

The organizational culture changes, in particular ethics of the firm. With horizontal relations and links narrow operational tasks, which employees face, are difficult to carry out. Occasionally administrative control is impossible to exercise. The remuneration system is modified to meet to a greater extent inner motivation of employees. The instructional forms are replaced with ethics of obligation to strengthen the positions the qualified and skilled workers take. With distinctions between managers and employees being eliminated, eradication of the system of formal control develops a kind of quasi-independent employment. An employee, being 'an owner' of some part of intangible means of production – particularized knowledge – and greatly controlling their own production is very much like self-employed.

Changes in communication between the company and its clients take place. The latter are also getting more flexible, selective and able to efficiently and successfully get adapted to the changeable conditions.

Thus, the company using the Internet for organizing its own operation faces a number of specific features not peculiar to companies in their traditional form.

First, the limits of the firm and its activities are changing. Intercompany interaction and cooperation with other firms become faster and less expensive. This statement is true for both structural and geographical aspects, as the company's regional units can be involved in the communication mentioned. The company as a whole can make contracts and deals with far-away or remote contractors.

Second, firms succeed in greater transparency of their operations. The work of their employees gets more evident. There are fewer possibilities to conceal their own blunders and mistakes than before. Opportunistic behavior is getting less spread.

Pricing gets more transparent as information on prices are easily available in information space with possibilities to be compared. Clients can follow the process of execution of their orders. Suppliers can get in touch with their clients in case of disputes or uncertainty in decision taking. Production is being adapted to the requirements of the particular client – the process called 'mass customization'.

Third, the time for inter-company transactions decreases. New flexible forms of organization and management, rapid capital flows, inter-institutional connections and increasing intensification of labor, all together lead to speeding up production process. The firm's reaction time is also its competitive criterion, the extent of its adaptability to the ongoing economic processes influenced by new technologies and information shifts.

And, at last, fourth, the Internet promotes standardization in both software and Net behavior. It helps decrease costs connected with consumer behavior appraisal and operating costs.

A new organization form – a network company emerged in the globalized economy. The first company applied the module-structure was Nike, that enabled the firm to perform efficiently. Among the major advantages of module-structure we can name flexibility, ability to adjust and to meet changing demands of the market. It also has a number of drawbacks such as: lax control, great distance between employees, decreasing purely psychologically incentives and may result in lower productivity. That's why new companies employed in virtual business tend to realize the set tasks.

5. Conclusions

We have to take into consideration these provocative advantages and disadvantages. All countries face many similar problems. The complexity of the situation in the globalisation of the world economy is also caused by a number of specific factors. But the integration to the modern global economy is not only desirable, but necessary for every country, and one of the first steps in this direction is the involving in the world information space, which creates preconditions for a successful participation in the world globalisation process.

In spite of all these contradictions the process of spreading of network structures is global, and modern SMEs should understand and use the possibilities of network markets.

References

1. KNOKE, D. Political Networks: The Structural Perspective. New York: Cambridge University Press, 1990, p. 290.
2. MARSDEN. P. Linear Models in Social Research. Beverly Hills: Sage Publications, 1981, p. 336
3. WASSERMAN, S. Social Network Analysis: Methods and Applications. Cambridge: Cambridge University Press, 1994, p.825.
4. WELLMAN, B. Networks in the Global Village: Life in Contemporary Communities. Boulder, Colo.: Westview Press, 1999, p. 377.
5. WELLMAN, B. Social Structures: a Network Approach. Greenwich, CT: JAI Press, 1997, p. 508.
6. CASTELLS, M. The Rise of the Network Society. Oxford: Blackwell Publishers, 1996, p.123.
7. SHAPIRO, C.; VARIAN, H.. Information Rules: A Strategic Guide to the Network Economy. Boston: Harvard Business School Press, 1999, p. 107.
8. SIMON, H. Rationality as Process and as Product of Thought. American Economic Review, May 1978, v.68, no.2, p.1-16.
9. SHY, O. The Economics of Network Industries. Cambridge: Cambridge University Press , 2001. p.75.
10. FARREL, J; KLEMPERER P.Coordination and Lock-In: Competition with Switching Costs and Network Effects. Oxford, 2004, p. 245
11. COASE R. The Nature of the Firm. Economica. 1937, vol.4, p. 386-405.
12. KELLY K. New Rules for the New Economy. Ten Radical Strategies for a Connected World. N.Y.: Penguin Books, 1998, p. 67.
13. DEARSTYNE B. E-Business, E-Government & Information Proficiensy. Information Management Journal, 2001, v. 35, № 4, October, p. 20.
14. ARROW K. The Economic Implications of Learning by Doing. Review of Economic Studies. 1962, № 2, p. 155-173.
15. NONAKA I. The Knowledge-Creating Company. Woburn: Butterworth Heinemann, 1998, p. 183.
16. NONAKA I. The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation? Oxford: Oxford University Press, 1995, p. 161-162.