CREATING KNOWLEDGE IN THE STRUCTURES INTERDISCIPLINARY TEAMS

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Summary: Scientific and technical progress and which are the product of innovation in terms of corporate social responsibility is an important factor of economic growth and competitiveness. New technologies are emerging in cooperation of scientific institutions and enterprises are disseminated in the process of technology implementation and diffusion of innovation. This paper discusses briefly the main elements of knowledge creation and innovation in the structures created ad hoc interdisciplinary research teams. Knowledge of the process of innovation in terms of business needs are the basis of interdisciplinary research teams in universities Ad-hoc, face several difficulties. Laborious and self-sacrificing work of research teams, supported by modern techniques virtual, it often seems surprising results.

Keywords: knowledge, innovation, knowledge and technology transfer, research funding.

1. Introduction

The dominant contemporary challenges in practice amount to a daily response to signals from the turbulent environment and the continuous search for innovative and entrepreneurial solutions to address these problems. This applies to whole societies, companies, institutions and individuals [12,15]. Innovation enterprise is defined as an incentive for exploration and commercial exploitation of research results, new concepts, ideas and inventions, leading to an increase in the level of modernity and strengthen the company's competitive position, and technical ambitions entrepreneur.

The essence of innovation transfer is seeking new uses of known (ie, already invented, existing) manufacturing techniques while the diffusion of innovation is related to the gradual dissemination of new technologies, and thus further its applications (implementations) are usually in other companies. Creating new technologies and improving their implementation and diffusion is a complex process carried out by many actors including academic institutions (universities, research institutes, research and development), business (including small and medium-sized), support institutions and intermediaries (banks, technology transfer centers, consulting firms, and others).

Transfer of technology is generally the dissemination and transfer of technical knowledge from the field (institutions) science to practical applications (business). Technology transfer includes all forms and channels of diffusion of innovation and the use of various media innovation: explicit knowledge (publications), protected knowledge (patents and licenses), formalized channels of dissemination of technology (courses, workshops, studios, trade fairs, exhibitions) and informal contacts (including with customers, suppliers, consulting firms but also from competing companies), mergers and acquisitions, external investment, the purchase of machinery and equipment but also materials and components for manufacturing and others.

The creation of knowledge, the creativity is a process that occurs at different levels of social organization. This is the process: individual, psychological and neurological, social and psychological, involving mainly on the interaction between the participants and the wider research teams of scientific, organizational and macrosocial. From an economic point of view, knowledge is part of the economic infrastructure and market forces. Knowledge is a public good and can be materialized in artefacts and implement the education of the people. The materialisation of the artefacts made in the innovation process. During diffusion, the sales network and other networks, dissemination, comes back into the public sphere where knowledge through education is carried out in the education of the people. Education usually requires the use of knowledge materialized in stills and other artefacts [2,12,15,17,23].

Well-trained specialists in different fields get into the labor market (for companies to universities) to be drafted where interdisciplinary structures often built ad hoc research teams. This is expected to have the knowledge, creativity and thinking, and the synergy of a well-configured accomplishments of the entire team gives positive, often quite original and thrilling in its scope of action results.

2. Typology of knowledge

Knowledge will remain divided into four categories, which dates back to its roots to ancient times [11,12,18]: know-what; know-why; know-how; know-who.

Know-what - refers to the knowledge of the "facts" and is as synonymous information - can be transmitted using data and bits. Know-why - refers to the knowledge of the principles and laws in nature, in the human mind and society. Know-how - refers to the ability and skills of the employees concerned, new products, recruitment or deployment of new information technology. This kind of knowledge can be a factor in competitive advantage and leads the organization to its purchase or acquisition through the implementation of research and development.

Knowledge has been the subject of interest and analysis since the dawn of our civilization. Aristotle distinguished between the following types of knowledge:

- Episteme: knowledge that is universal and theoretical (know-why),
- Techne: instrumental knowledge, contextual and practical (know-how),
- Phronesis: normative knowledge based on experience, context and common sense (know what).

Most of know-how is the domain of one company or research team, however, cooperation between different organizations gives rise to networks, and these, in turn, the issue of sharing of knowledge and its co-creation. This type of network can be created by research teams and laboratories. This kind of knowledge and ways of its transmission and distribution is closely related to internet technology. This is an example of application of new technologies to create utilitarian knowledge, associated with an increased rate of information exchange between the partners operating in the network structure of relationships.

New products are increasingly produced based on the achievements in many fields and disciplines, which gives meaning access to different sources of knowledge. Know-who determines the holders of knowledge and describes the knowledge I have, also applies to the ability of social cooperation and communication with external experts. They are often components of tacit knowledge, which comes from direct contact workers or research units. None of this category of knowledge in Aristotle's taxonomy due to the fact that we all know

today creates knowledge in person. This feature is closest to the source system development perception scientific and technical information, which is carried out continuously, as a derivative of personal contacts made to the classification of domain (index) rankings publications and direct exchange of information realized through Internet technology.

Know-how is a kind of knowledge to which public access is most limited, and the transfer of the most complex. This means that the know-how, can never be fully public good, and companies have access to this knowledge by hiring experts or entering into strategic alliances with other companies.

Know-who refers to the combination of information and social relationships. Know-who based on personal relationships that are not subject to the laws of the market, but are stimulated by certain social, cultural and technological. Experience with expansion units representing different countries and cultural circles of economic development levels indicate that unified the organizational, legal and supervisory systems accelerate the elimination of weaknesses outsiders groupings of countries in the EU, which is an opportunity Polish.

Social conditions for creation and application of knowledge is the subject of study of globalization, is called social capital that allows businesses and individuals to easily entering into relationships, sharing knowledge and conduct business. Human capital is particularly important in a knowledge society, because learning requires interaction in which mutual respect and trust are very important. If the bond will be torn disappear learning processes and the existing intellectual capital can begin to depreciate.

Human knowledge is generated and transmitted through social interaction (called knowledge conversion) between tacit knowledge and explicit. Closely related to this is another assumption - the knowledge of individuals is the basis for the creation of organizational knowledge - the company should be in a certain way to win.

The processes of creation and transfer of knowledge depends to a large extent on the move towards a common understanding of the user's knowledge. It consists of context and experience presented in a culturally conditioned structure.

2.1. Models of knowledge creation

The circumstances in which individuals, groups and organizations generate new knowledge have so far examined only to a small extent, although one can suggest steps listed below important in the formation of [1,3,7,12].

1. Verification of knowledge. After the creation of the knowledge must be verified. The industry operates a commercial element, where the market success of the product verifies the knowledge contained therein. At the same time new knowledge can be verified by science. There may be a pragmatic approach: test the new technology in practice not require scientific validation.
2. Gathering knowledge output. Before attempting to solve complex problems already known to be collected in the form of codified knowledge. In various sectors, there are different approaches to the collection of baseline knowledge and different techniques to overcome the difficulties in the acquisition.
3. Loading knowledge - there are many ways to transfer the knowledge, such as:
   - by the media (books, magazines, videos, etc.),
   - with courses taught by experts,
   - by personal contact with the holder of knowledge,
   - transmission with the use of telecommunications

- the use of Internet technologies.

Each of these forms is much scope to disruptions in the flows of knowledge.

4. Adaptation - to an individual or organization assimilated new knowledge, there must be a reason or incentive. Acquiring new knowledge often means giving up already possessed. New knowledge and new practices can be properly selected and adapted.
5. Implementation - is a necessary but not sufficient condition for the application of knowledge. It deals with the desire to change, you may receive a number of barriers, such as:
   - the lack of opportunity to apply knowledge,
   - practical problems and limitations, such as low resources, lack of time and support,
   - technological gap,
   - barrier civilization - education.
6. Institutionalization - the process is the most complex. It concerns the transformation of knowledge into a routine, "normal" practice applications. Institutionalization occurs when the knowledge to become independent of the presence of the person who brought it. An example of this type of innovation can be well programmed and implemented in the organization of information systems that create new working environment widely accepted and used without the support of artists.

Problems relating to the "production" of knowledge is well illustrated (fig. 1) linear model, which is the classical approach to the process of creation - transfer of knowledge and its application in the system.

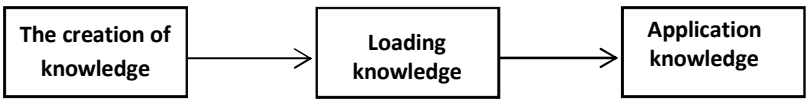

Fig.1. The linear model

As is clear from the practice of industry standard linear model of innovation, where knowledge was created in academic centers is used in plants occurs sporadically. This model does not reflect the reality for several reasons:

- scientific knowledge is largely codified, while the knowledge engineer is largely made up of practical know-how and tacit knowledge,
- creation of knowledge takes place both in industry and in universities,
- knowledge is transmitted in many ways, not only through technology transfer,
- industrial companies are diverse in terms of size, specialization (from engineering to biotechnology), location and culture, making it difficult to establishing contacts and causes sectoral differences.

What is needed is therefore a non-linear model - interactive [12], in which the relationships between elements of the system are its most important feature [14]. In these models three basic processes may affect each other, and different actors contribute to these interactions. The diagram refers to a practice phase of the cycle of knowledge creation,

which becomes more complex and creates interactions allow the formation of a new layer of knowledge.

Increasing the rate of obsolescence of knowledge and a high level of investment required for its acquisition necessitate an interactive activation and cooperation of all stakeholders in the creation, transmission and application of knowledge.

Among the factors to be taken into consideration when creating models describing the production, transmission and use of expertise include:

- "reasonable" price, while its design should take into account the costs and the opinions of those who will be prepared;
- markets and consumers should play an important role in shaping innovation and determine the commercial success of the product and the price can be one of the factors determining how to design;
- new knowledge created in universities is an important driver of innovation, it falls to interact with other forms of knowledge, such as research centers created or hidden practical knowledge engineers;
- to improve the innovativeness of the economy may be affected by increased cooperation between universities and industry, and joint research projects;
- a large part of knowledge, especially in hidden forms is transmitted during direct contact, and new knowledge is transmitted through the network of human relationships;
- the creation of new knowledge is related to the location and the interaction of different types of knowledge.

The dynamic model of knowledge creation is thus to make the transformation of the pyramid of knowledge in the knowledge loop shown in fig. 2.

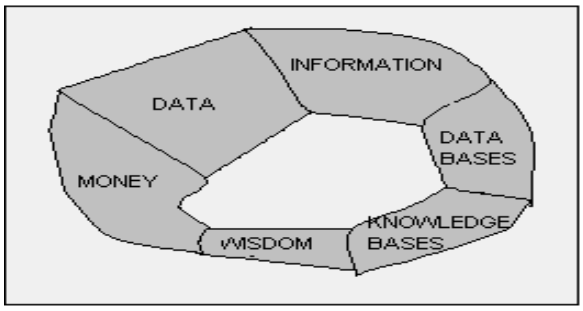

Fig.2. Loop knowledge [12]

2.2. Transfer of knowledge

We can distinguish five different types of knowledge transfer, based on the nature of the distribution of information, which is transmitted in a certain manner, repeatability circumstances in which knowledge becomes necessary and the degree of similarity of tasks carried out when it becomes necessary. They are: serial transfer, the transfer faithful (imitation), Shuttle remote (imitative), transfer and transfer of strategic expert [1,3,4,12,25].

Serial transfer is practiced by teams working in carrying out the same tasks, and the team is a source of knowledge is also a team on the recipient of that knowledge.

Transfer occurs when a team of imitative transferring knowledge is different from the team that acquires it. A significant difference - apart from the band - but there is a place to complete a task. This allows the system to move and applying knowledge from one place to another - by. known. best practices.

Transfer far is related to the transfer of tacit knowledge - in this case, the transmitting unit and receiving knowledge does not perform routine tasks. This type of transfer is based primarily on mutual interpersonal relationships and focused on the acquisition of knowledge is the key to solve a specific problem.

Transfer Strategy is a specific type of knowledge transfer used for solving very complex problems. Strategic transfer of knowledge can be characterized as a vital, complex and dynamic process of communication.

Expert knowledge transfer is related to the use of expert knowledge in the field. Passed it is usually in the form of articulated, statistically valid, opinions and expertise.

In summary, the transfer of knowledge takes a different character depending on the type of knowledge that is passed, the type of tasks for which that knowledge is needed. Also play a significant influence circumstances in which a knowledge is to be used. However, the most important appears to be the same division, and understanding of the resulting differences. Just choose the appropriate method of transfer makes it effective.

2.3. Economic aspects of knowledge creation

Researchers economy industrial regions indicate the regional networks as a source of expertise [6,8,11,18,25]. Theories companies increasingly take into account the competitiveness of companies based on the competence of their staff, emphasizing the importance of science in the team and team skills than the skills and learning units. Layer knowledge (ways of communication, common procedures, generally accepted methods for solving problems and finding solutions) is often called the organization's culture and is an attractive component of the character and reputation of the company.

When the sector is fully involved in the market and fully subject to market forces, the operation of the knowledge base determines the existence of the enterprise. In particular, this involves either the creation of new knowledge (innovation) and the capitalization of the knowledge or to react to innovations coming from competitors. Competitive strength of the company depends so heavily on the mechanisms of absorption of knowledge and its dissemination.

In the process of knowledge production is the primary effort needed to innovate. It can be concluded that the source of innovation is the creative application of knowledge, or use it to produce goods or services - which can also increase understanding of the functioning of the world around us. Because the skills and competencies along with expanding, therefore, during the production of knowledge at the same time we can talk about innovation and learning.

The latest models of innovation emphasize that innovation is an interactive process in which companies interact with customers, suppliers and knowledge institutions. Innovative systems are created by the authors involved in the creation of knowledge and interaction. The authors of these are: enterprises, institutes of technology, universities, training schemes and venture capital. Together they create an environment for knowledge creation and innovation.

The trend toward learning organizations is reflected in both the relationships within companies and between them. Inside the Company observed a decline in the efficiency of

multi-level hierarchical structures and lack of sharp boundaries between their various functions. There is need for decentralization and the creation of multi-disciplinary teams. There is a growing demand for workers so willing to learn, while capable, flexible, ready to work, acceptance of responsibility.

In addition to organizational change - rising importance of developing awareness among employees and teams involved in the learning process. While the creation of knowledge is an important determinant of long-term development of the global economy, there is also great potential for expansion and use of knowledge available. This is reflected in the efforts undertaken by the State, with a view to increasing the diffusion of innovation, as well as training, leading to the construction of competence. The presence of this type of activities carried out in the policy of the state may be crucial for the competitiveness of the economy to international markets

More and more knowledge becomes an object resembling a trading market transactions (the buyer, the seller and the agreed price). One of the reasons why markets work are the formal and informal institutions, including dealing with the protection of intellectual property (patents, copyrights). A significant part of the knowledge flows in the form of "built-in products." Scientific instruments and computers contain a vast amount of knowledge, and users with the appropriate qualifications for this item can perform complex operations. Transfer of knowledge through virtual technology is sometimes combined with a book-entry transfer of knowledge [11,25].

2.4. Knowledge in the process of innovation

Innovation plays a particularly important role in the modern economy, for which knowledge has become a key factor of production. It is worth explaining here, the differences between concepts such as: data, information and knowledge. These terms are distinct types of economic goods of a particular utility. The term data means the raw facts, viewed as fragmented, random signals derived from primary or secondary sources. The information is correct, which can be observed in the data characterizing the space, time and energy, but they get incurs economic cost. Knowledge other hand, is a kind of collection of claims relating to the world around you is changing along with a display of new information [13].

Accordingly, knowledge is the ability to interpret data and information in the process of making sense of the data and information in order to achieve this goal. In connection with this knowledge, which is a bundle of information structured and interpreted, it can transform into an innovation under the condition that it be communicated to users. Knowledge is one of the most important resources of an organization. Its specific nature makes no other resources can't compare with it because:

- knowledge does not disappear when in use,
- the value of knowledge increases with the number of persons who have,
- knowledge resources grow in direct proportion to the frequency of its use,
- knowledge is the spread - is found in many places at the same time,
- knowledge is relative and ambiguous, so it can be used in different ways,
- knowledge quickly get out of date,
- do not always compensate for the effects of spending effort and resources.

Regularities that govern the formation, circulation and the role of knowledge in innovation in the modern system of social engineering and economic results from the

definition: "Innovation is an idea, practice, method, technology, or product perceived as new by the people or organizations they social or economic adopters."

Rights of innovation [10]:

1. The law of conservation - all innovations are combinations of known elements, what is new is their structure and function.
2. The law of causality - the innovation ahead of production, production precedes consumption, innovation and discovery ahead.
3. The right frequencies - the potential of innovation is essentially infinite.
4. The law increased innovation - innovation, growth depends on the number and size of the inventors of the population in which they operate. Applies here, the relationship between the ratio of innovation and a quotient p population to urban environments and cities:

$$i = (p)^{1.25} \qquad (1)$$

   or reciprocal relationship is not directly proportional, but exponential with an exponent of 1.25. This means that 10 times the city has more than seventeen times increase in the number of innovations, and 50 times greater metropolis has more than 130 times more innovation.
5. Universal law - innovation can't be abused, but may be lacking investments in its production and dissemination.
6. The law of growth of income (profit) - per capita income of a large social group can be increased only by a long-term increase in the level of production technology, namely through the creation and implementation of innovations.
7. Right recombination and evolution - new innovations to attract inventions already known and familiar knowledge, creating further innovations for more excellent properties and applications (speed camera=Doppler radar to determine the speed + camera).

Innovative company combines the action of a novel three basic elements: creates a new idea, implementing the project and finance it. Innovative activity is a series of activities characterized terra scientific (research), technical, organizational, financial and commercial, whose purpose is the development and implementation of new or significantly improved products and processes owls.

Regardless of the type of interaction process innovation requires a certain arsenal of data and information that in the next stages are transformed into knowledge [11] needed to solve problems (fig. 3).

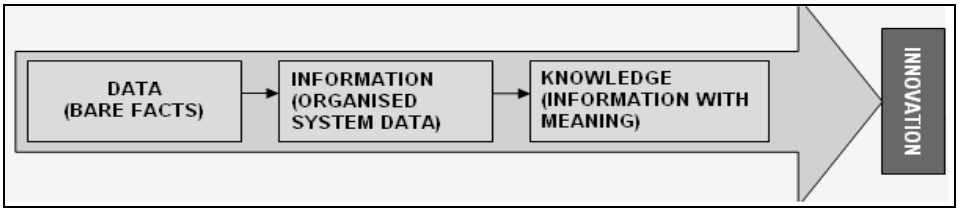

Fig. 3. The creation of knowledge in the process of generating innovation

Typically, the collection and storage of data in the enterprise and transforming them into information is carried out through information technologies and communication networks. However, without the involvement of qualified and motivated employees can't be correct to interpret the accumulated information and give them a specific meaning which determines the formation of knowledge.

Number of phases that make up the innovation process is determined by the scope of the business and the definition of the principal event is the implementation of a new product or solution. In fig. 4 below shows the process model, which consists of four main phases: 1 seek, 2 choice, 3 implementation, 4 discounting.

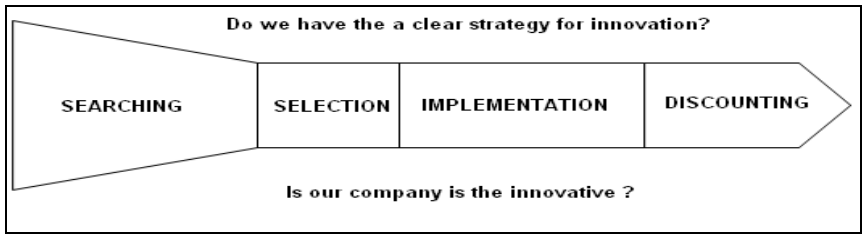

Fig. 4. A simplified model of the innovation process

Exploration phase focuses on receiving signals from the environment to inform about the possibilities of change and looking for answers to the question "how to find an opportunity for innovation?" The vast majority of innovation arises from the occurrence of a number of factors, such as the need for change, together with incentives in the form of new opportunities.

Phase selection is focused on the question of "what to do and why?" Because innovation is risky and even very rich companies can't afford to unlimited risk. The primary objective of this phase will be the combining of the collected data such concept of innovation, which will be possible to further processing in the subsequent stages and levels of innovation.

Implementation phase includes the question "how to make it work?" This phase consists of three stages particulars of obtaining knowledge of the project and the placing on the market and, therefore, focused on the implementation of ideas (such as the creation of a new product, service or business model business) .

Phase discounting answering the question "how to be a benefit from this?", Focuses on the discounted value generated by the implementation of innovation (eg, increase market share and cost reduction). In this phase should be aware of both the positive and negative effects on the orientation of the innovative enterprise.

3. Creativity and innovation in higher education institutions

It is difficult to shape the relationship between universities and businesses. Since researchers are required to carry out basic research, which, thanks to scientific publishing raise their academic status. In turn, companies are reluctant to publish their achievements for fear of competition, especially in the early stages of market development. Increases the problem of effective protection of intellectual property.

The relationship between universities and businesses cause tensions, particularly with regard to intellectual property rights, because in sectors such as mechanical engineering,

companies often decide to create knowledge on their own or in cooperation with reliable partners only.

Companies compete aggressively, but at the same time they must be willing to cooperate. Companies are constantly working together to adopt new ideas and techniques arising out of their industry and promote cooperation in their own industry. Even the world's best known companies are borrowing knowledge from outside (benchmarking). In the knowledge economy partnership is an essential element of competition. To use the full potential of people and technology, companies need to collaborate in their own industry, region, as well as the education sector.

Much more is known about teaching in schools than on learning in the workplace, because in this area it was only recently studied [9,12,14,16,24]. Start of work by the graduate school is a big problem. In recent years there has been the concept of mentoring, the assistance provided to new employees by experienced practitioners in the workplace. Relations between the knowledge acquired at the university and the practical know-how in the workplace can be a key innovation as mentoring can be effectively supported. Under conditions of extreme crisis and unemployment for university graduates also discussed a difficult problem even more complicated.

Most recently seen a growing interest in developing both innovation and implementation of the principles of CSR (Corporate Social Responsibility - CSR). Summary of the concept of quality-built research teams from their creations, which are: knowledge, creativity and innovation, is subject to many factors. Social responsibility of business and science associated with the process, decision-making and action - is also determined by the requirements of carrying out activities in accordance with the principles of sustainable development.

Innovation in CSR enables the implementation of new changes, business and services, it is therefore not random, but the result of deliberate search for those who are looking for not only her, but also have the knowledge to grasp the successful innovation and how to implement it. It seems that the creation of socially responsible innovation is a clear incentive to look completely different solutions, which can bring a lot of good, but also improve the competitiveness of innovative social groups.

An important issue building science team is skill full use of intellectual resources, which is hidden at different levels of activity and in various forms. Intellectual capital consists of people, their knowledge and processing capabilities and experience, these are the procedures for forming the organization, patents, technology and manufacturing techniques. The knowledge, experience and information resources assets that form the basis for construction of research teams [9,10,11,23].

The need to bring the creativity and innovation in research and education concerns especially all types of universities, which are now urgently need to transform the university of the third generation (3GU). Indeed, due to the rising costs of research, education massification and decreasing state support must be added the third goal of the university: innovation, the implementation of the acquired knowledge (know-how) into the economy nationally and internationally. The natural area of collaboration between university and industry research is commissioned and called "woucher's research", the results of which may be of interest to the industry - this is a common area for the future development of the customer - customer products.

The main tools of the state to university-industry collaboration are:

- linking science policy with a program of economic development;
- increase spending on education;

- changes in research funding policy, priority directions of research;
- new rules on research funding and technology transfer from universities to the economy;
- new funding instruments Implementation (venture capital, seed capital, loans);
- promoting the mobility of researchers and students of the international cooperation;
- new standards for evaluating schools (rankings, the new criteria - implementation, patents).

Conducting research and commercialization is a source of innovation. The purpose of generating innovation is discounting the value of such in the form of market success, maximize market share and reduce costs. The cognitive aim here is therefore to present the essence of a commercial discovery research as one of the ways to improve technology transfer from science to industry.

Institutions of higher education are directly linked to the creation of innovation. The degree of involvement and success in the commercialization of research results of individual universities varies. Nevertheless, for many universities where research is conducted to develop various innovative solutions, one of the main problems is to raise funds necessary for the introduction of a new product on the market.

The period between the early stage of the work on innovation and the start of funding from external sources, often referred to as the "valley of death" due to the fact that a number of innovative projects destroyed because of lack of funds. The essence of finding commercial value of research as a way to improve technology transfer from science to industry, an important issue in the process of overcoming the problems associated with obtaining funding for research centers that carry out research.

The problem in recent years is a new issue of the financing of higher education in the life of the country. They stand in front of him rectors and university management bodies, and that the it is half the families in the country, because it is estimated that approximately 50% of young people leave school with higher, at least at the level of bachelor / engineer.

What, therefore, conflict is born this simplified model of financing. To make a lot of money at the University have a large enrollment of students and graduate students, who would not pay for a student's "saw" because the transfer to go away and disappear from the ministry! If you have a lot of students to staff is overtime and can earn some money for the very wealthy pay. There is so much overtime and no time for research, publications and on the basis of high category in the statutory activity is slowly disappearing. This in effect gives a low level of education and low levels of research.

The second way to force colleges and universities to "grant" national and European, and the order of the economy. Financial ideal would be that every employee participates in a number of "grants", the university has called them. indirect costs (the national 30% to 60%), and employees can make extra money again to lean wages and are happy. However, super saturation "grant" has the same effect as before. The training does not have much time, so somehow it is, and the enormous amount of "grant" it can't take care of the quality of research, publications and patents. The effect is similar as before, the low level of education and research.

What to do, two extreme models carry the same negative results, how to reconcile these contradictions? It can therefore formulate the ideal (expected) final result - high level of education and research. And when this is possible? Then when each appropriately selected and rewarded employee carries the right to one another teaching and innovative research. Is it possible to solve using existing principles, rules and financial capacity? If one considers

all the resources at our disposal, local conditions and will serve the principles and patterns of action TRIZ [10].

The main source of funding is the creation of knowledge derived from the art of conversion of knowledge into money, ensuring that wizards gain a sustainable competitive advantage. The unpredictability and growing environmental requirements necessitate improvement of the structure of the functioning of modern organizations and research teams. The result of these trends are organizations and groups operating in the virtual system. Organization (Team) is a dynamic form of virtual collaboration network of independent entities (people) that temporarily combine their resources to achieve a particular purpose. Enabling factor for effective cooperation in the framework of the virtual organization are varied types of systems. Virtual organization, although not physically exist (acting being apparent, often invisible) are grouped into a single structure of a collection of professional, loyal and mutually reinforcing entities.

Virtual organization is seen as a future business model of extending business processes beyond the boundaries of a single enterprise, and allows its participants to gain access to new markets, offer new and more innovative products and enable to adapt flexibly to new market requirements. Virtual organization is a temporary and variable form of co-specialized and distributed entities (individuals, departments, whole plants), that share key capabilities, resources, costs, and risks, and integrated into a coherent unity through the tools and the means of information technology for its stated purpose. Filling the purpose for which it was established organization (team) Virtual, resulting in the disintegration and dispersion of the constituent entities (individuals).

Virtual organization bringing together a community of different actors require the development of integrated tools that enable mutual communication in real time between the partners. The dynamic development of information technology, spread of broadband Internet, the increasing popularity of outsourcing and competition in the market for IT vendors, contributed to the software offered as an e-service (SaaS - Software as a Service). In the traditional form of use of the software required to purchase a license, install and configure applications and databases on IT resources (computers, servers) belonging to the enterprise, and the current management of the staff of the establishment.

The SaaS customer does not need to buy a license to install the application on their own IT infrastructure as a third-party vendor provides and maintains a web space different types of software, and the customer after the payment may have to be accessed remotely using. The offered software is designed for simultaneous use by multiple independent clients. Team-building for the implementation of the specific research project is neither easy nor simple. This team should be very large, essentially consistent, accessible task-matched mentally and willing to carry out difficult, because new cognitive challenges.

The special role is played by the team leader, who should:

- consider the numerical and content of the team;
- propose and persuaded to participate in the structure of the team;
- to propose a job and pay the members of the team;
- bring out the tacit knowledge of team members;
- inspire and motivate you to innovative solutions;
- organize frequent conversations about issues of the project (brainstorming); add up periodically to personal and team;
- distinguish the effects of the work of students and young workers;
- promote the team members in the academic promotions, awards and honors;
- clearly defining tasks and conscientious way to settle their implementation;

- learn to write the following design applications;
- create and take care of a good and friendly atmosphere work.

We must therefore examine the role of interaction between universities and industry to develop innovations and the challenges that the education of engineers.

4. Summary

Ability to create new knowledge and its practical application in both the production and the formation of the next innovation is one of the most important factors influencing the pace and quality of economic growth.

Research projects of recent years are difficult to formulate and difficult to obtain in the existing system of motivation and ratings. There are, however, the basis for the development of research, raising awareness of the world around us, a source of innovation and the basis for much interesting research teams. They are an inspiration in my life for scientists, as well as a challenge for the industry workers.

Selected aspects of this thematic area briefly discussed the need for this study, indicating the possibilities and limitations in the creation of knowledge and innovation, especially in the difficulties of setting up and functioning of effective structures for cross-disciplinary research teams. Many confine this issue has been known for years, but life always appends new lines of cooperation scenarios science - industry, which is worth to flexibly adapt. Nothing is impossible - it is worth trying, trying to creatively and innovatively, stubbornly - "and will act fruit." Creative human activity in engineering is a science-based methods (technologies) transform our reality for the individual and his environment - it's creativity. Creativity is a quality of the mind of every human being, and if the active leads to change, to innovate, which may affect not only the creator, but its closer and farther surroundings. Creativity is inventing technology and methodology for new solutions to the problems of understanding ourselves and the world, as well as the problems of converting it for the good of our and our environment. In general, it is recognized:

- discovery: new ideas, new knowledge and new ideas;
- innovation: goods, services, expertise and experience, equipment technical systems;
- inventions: machines, technologies, products, markets and business organizations.

Man is causative for the resolution of identified problems, using the synergy created research teams, technical means available and enormous willpower and perseverance in understanding reality.

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