

# On Innovation and Knowledge Economy in Russia

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**Abstract**—Innovational development of regions in Russia is generally faced with the essential influence from federal and local authorities. The organization of effective mechanism of innovation development (and self-development) is impossible without establishment of defined institutional conditions in the analyzed field. Creative utilization of scientific concepts and information should merge, giving rise to continuing innovation and advanced production.

The paper presents an analysis of institutional conditions in the field of creation and development of innovation activity infrastructure and transferring of knowledge and skills between different economic agents in Russia. Knowledge is mainly privately owned, developed through R&D investments and incorporated into technology or a product. Innovation infrastructure is a strong concentration mechanism of advanced facilities, which are mainly located inside large agglomerations or city-regions in order to benefit from scale effects in both input markets (human capital, private financial capital) and output markets (higher education services, research services).

The empirical results of the paper show that in the presence of more efficient innovation and knowledge transfer and transcoding system and of a more open attitude of economic agents towards innovation, the innovation and knowledge capacity of regional economy is much higher.<sup>1</sup>

**Keywords**—knowledge economy, innovational development, transfer of knowledge, institutional preconditions, innovation and knowledge capacity.

## I. INTRODUCTION

THE innovation development strategy, which depends on intellectual resources has become the main direction of Russian economic development. The present situation, connected with the development and introducing of the innovation technologies is unsatisfactory.

The number of the innovation enterprises is less than 10% in Russia. The state costs for the innovation introduction support are very low. The minister of economic development of Russia Mrs. Nabiullina pointed out the innovation activities stimulation has to be assumed as a basis of economic modernization.

Innovational development of regions is generally faced with the essential influence from federal and local authorities. The trends of such influence could either be positive or negative.

Unfortunately in Russian economic policy there is no very precise and complex program of innovative development as on macro, so as on regional levels. The issues of management of innovative development are partly

covered in the programs of industrial and technological policies and of improvement of tax systems. It is connected with the absence in state regulation theory precisely and united conception not only of innovative development, but also of the economic development as a whole.

The conception of polar regional development and theory of structural-innovation development are widespread in Russia.

According to the first concept, concentration and then spreading of economic growth on defined territory is connected with «pro-polar» enterprises, which because of the big scale and progressive industries, are able to elaborate the growth of other enterprises and other industries. After that when level of development of creating polar of growth reaches some threshold, there is no necessity in the government participation in the form of preferences and scale investment. Different kinds of polar effects and different multipliers begin to work. The polar of growth begins to be developed because of endogenous factors. Support of growth polar on the first step of its foundation from the government side or Regional administration is considered only as reinforcement of the process of regional development. Nevertheless, the absence of the reinforcement does not allow forwarding the process of regional development.

In spite of wide-spreading of this theory the authors of this paper prefer more the second one – structural-innovative theory. It is considered useful to shift accents in regional development from anti-depressive to structural-innovative one. The strategic goal of this approach is seen as providing with the rising of industrial production and rationalization of production of real sector for achievement of competitiveness of regional economy. However, in practice, in realization of strategy the main emphasis is made on structural components while innovation aspects are not taken into account. Organizational mechanism and regional development strategy do not support priorities in structural changes. That is why, for Russia it is the most essential issue to facilitate attention to innovative development and to forming an effective innovation potential.

## II. THE PROBLEMS OF LEGAL REGULATION OF INNOVATIONS

The improvement of legislative regulation of innovation is very important for completing of Russian innovation system construction. The analysis of Russian legislation shows that innovation in Russia is regarded only as an object of state management and not as a complicated complex of interrelations of state, business, science, culture, education and society.

The problem is that innovations are fragment and they still have to become the natural factor of management and social life in Russia. The federal Law “On creation of the innovation enterprises by scientific and education institutions for intellectual property introduction” № 217

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declared that more than 200 the innovation enterprises have no physical products, and to come to their rescue when they are to be organized (about 30 thousand young specialists as employees). It is necessary to work out a comprehensive whole of innovation legislation, regional and local levels. Innovation activities are regulated by different norms of administrative, financial, civil, tax and labour law. But there is no one basic special law on innovation activities in Russia. It was decided also to organize a special Commission of legislation Council of Russia in order to provide the innovation activities development in Russia.

The Economic policy Committee of Russian Federation has to work out a bill (law in draft) "On Innovation activity in Russia". It is important to create the law on state strategic innovation planning.

A vice-president of Federal Committee on economic policy pointed down the necessity to organize a special agency responsible for technological and the innovation development of Russia. In the Former Soviet Union it was a state committee on science and technique.

Some problems are connected with the regulation of intellectual property.

Intellectual property rights protect innovations and creations and reward innovative and creative activity. Intellectual property rights are international in character and in that respect they fit in rather well with the economic reality of the global economy [1].

In business, innovation can be easily distinguished from invention. Invention is the conversion of cash into ideas. Innovation is the conversion of ideas into cash.

Intellectual property is a term referring to a number of distinct types of creations of the mind for which property rights are recognised--and the corresponding fields of law [2]. Under intellectual property law, owners are granted certain exclusive rights to a variety of intangible assets, such as musical, literary, and artistic works; discoveries and inventions; and words, phrases, symbols, and designs.

Ayn Rand noted that copyrights and patents are the legal implementation of the base of all property rights: a man's right to the product of his mind. An idea itself cannot be protected until it has been given a material form [3].

There are two kinds of monopoly in intellectual property sphere in Russia:

- 1) legal monopoly
- 2) secret monopoly

If the invention can be quickly imitated by help of reverse engineering it needs to be patented. In this case patent will confirm legal monopoly on intellectual property. If invention cannot be imitated or copied by reverse engineering, the owner can protect it as a know-how. But legal protection of know-how in Russia is very weak. The confidential nature of know-how excludes the possibility of obtaining a patent. That's why the owner of know-how can receive only secret monopoly [4].

But according to economist George Reisman, patents do not constitute monopolies [5].

"Patents reserve markets, or parts of markets, to the exclusive possession of the owners of the patents, and they do so by means of the use of physical force as much as it is against the law to infringe on these rights. The fact that the government is ready to use force to protect patents ... is fully as proper as that it stands ready to use force to protect [for example] farmers and businessmen in the ownership of their

set upon by trespassers or attacked by robbers" [6].

Exclusive rights are generally divided into two categories: those that grant exclusive rights only on copying/reproduction of the item or act protected (e.g. copyright) and those that grant a right to prevent others from doing something.

### III. THE NEW CODIFICATION OF INTELLECTUAL PROPERTY LAW IN RUSSIA

Part IV of the Civil Code of Russian Federation dedicated to legal regulation of Intellectual property rights came into force in 2008. It is a first attempt of codification in Intellectual property sphere in Russia. That's why a lot of new norms appeared.

The main problem of Russian Civil Code (part IV) is that many rules (norms of Law) contradict the norms of International Intellectual property Law (i.e. protection of inventions, creations, ideas, know-how, trade secrets, innovations).

An invention can be patented if it is embodied in a physical model; a story has to be written, printed or presented in any oral form. But patent or copyright protects the idea and not the physical object as such.

Introduction of the Part IV of the Civil Code of the Russian Federation has completed codification of the civil legislation of Russia. It completes the work on full systematization of the whole civil legislation, regulating the relations in the sphere of intellectual property and a number of related norms in the Civil Code.

Introduction of the Part IV of the Civil Code of the Russian Federation allowed to systematize the federal legislation on intellectual property. The basis of this system is recognition of subjective intellectual property rights for the results of intellectual activity and the means of individualization (for intellectual property) as exclusive ones. However, they differ from property rights and other material rights because they are intangible, and they differ from personal non-pecuniary rights of authors and other creators of intellectual results by the fact that they become a subject of civil circulation and allow to involve the objects of intellectual property into such circulation.

### IV. THE PROBLEMS OF LEGAL REGULATION OF INTELLECTUAL PROPERTY RIGHTS

The main problems of intellectual property protection in Russia are the following:

1. The problem of idea protection
2. The problem of invention protection
3. The problem of know-how protection

*The problems of idea protection.* Ideas are not protected by the Civil Code of the Russian Federation. An idea is the main element of any object of intellectual property (creation, invention, innovation, know-how, etc.). But even the particular expression of an idea is left unprotected. Granting exclusive property rights to the creator of an idea allows him or her to appropriate much of its social value. Consequently, the incentive to create ideas aligns closely with their social value, as required for efficient innovation. The owner of an idea has the right to exclude others from using it. Excluding others from using an idea impedes their dissemination and application [7]. The recognition idea as intellectual property will make it possible to use the intellectual property rights,

that can provide an income to its owner. This profit will encourage the owner to continue his innovative work [8].

A copyright prevent someone from copying the material form of expression of an idea, but cannot stop them neither from expressing the same idea in a different form, nor from using the same form of expression if they had no knowledge of the original held by the copyright holder.

*The problems of invention protection.* According to the Civil Code of Russian Federation "a technical solution in any area, relating to a product (for instance a device, substance, microorganism strain, cell culture of plants or animals) or process (process of affecting a material object using material means) shall be protected as an invention.

An invention shall be granted legal protection if it is new, involves an inventive step and is industrially applicable.

An invention shall be deemed new if it is not anticipated by prior art.

An invention shall involve an inventive step if, having regard to the state of the art, it is not obvious to a person skilled in the art.

The state of the art shall consist of any kind of information published anywhere in the world, and made available to the public, before the priority date of the invention" [9].

The problem is that inventions are patented as utility models or are protected as know-how. Inventors prefer not to take out a patent for inventions because it is a very difficult procedure, it takes a lot of time and is very expensive. That is why they try to protect their inventions as ideas, know-how, confidential information, utility models. Inventors prefer not to take out a patent for inventions because it is a very difficult procedure, it takes a lot of time and is very expensive.

Patents, can be used to prevent second person from making the same design even if they had never heard of or seen the claimed "property". Those rights must be applied for or registered and are more expensive to enforce.

*The problems of know-how protection.* The protection of know-how is far from being perfect. A lot of rules (norms of Law) contradict the norms of International Intellectual property Law.

Know-how plays an exceptional role in the world. Know-how along with inventions provides acceleration of science and technical progress and socio- and economic development of countries.

Companies prefer not to take out patents on inventions, which are involved in newly developed hardware and technology, leaving them in secret. Companies act in this way hoping that know-how becomes obsolescent, the competitors will not be able to reproduce it without serious and expensive research. Accordingly, competitors cannot gain information about directions of research and company's developments through patent protection.

It is important that patent monopoly (inventions) is legal mainly in the countries where patent was received, while secret monopoly (know-how) works in all countries of the world until it comes into public domain or becomes available for rivals.

International trade practice shows that generally without know-how knowledge it is absolutely impossible to reproduce new technology through patent descriptions, published technical information, samples of new hardware that are presented on markets, national and international fairs. Furthermore, it is also impossible to improve the

basics. Therefore, a choice of type and form of purchasing a foreign technology should be predetermined by the possibility of purchasing licenses for know-how exploitation [10].

Many specialists, suppose that know-how form the basis of licenses and patents. Know-how allows to protect intellectual property from improper use in case of divulgence.

The role of know-how increases because know-how and inventions underlie intensifying globalization. Unfortunately, Russian Federation is the only country in the world where know-how is neglected.

In international intellectual property trade know-how is regarded as industrial property that is transferred by license transactions.

It is possible to define the following features of know-how:

1. It is the information, technical knowledge, experience, connected with the development, launching the production, operation, service, repair, improvement and utilization of new hardware, technology and materials.

2. It has real or potential technical and commercial value;

3. It is being applied or can be applied.

4. It has confidential nature, it is not in the public domain;

5. It has no legal protection on the national, regional and local levels.

6. It is necessary to possess special knowledge and experience for using it.

7. The way of its fixation or adoption can be different (written form, oral or visual).

8. Without obtaining know-how it is impossible to improve technical objects, technology and materials, in which know-how is involved.

The fourth and eighth criteria have vital importance for evaluating the possibility of recognition the technical solution as a know-how.

The owner of know-how must believe that the release of the information would be injurious to him or of advantage to his rivals. The owner of know-how must believe that the information is confidential or secret. The two first beliefs must be reasonable. Finally, the information must be considered taking into account trade practice [11].

The old Russian Civil Code (1964) and other Russian laws did not give the definition of know-how, trade and commercial secrets. Russian legislation said nothing about protecting and guaranteeing the categories of confidential information [12].

The information has identifying features of confidential information if:

- 1) it was not in the public domain;

- 2) the information refer to the usage and practices of particular industry;

- 3) the release of such information is injurious to the enterprise and gives advantages to other companies.

There are two classes of know-how. The first class of know-how consists of information in the form of skill and experience built up by individual employees in relation to the practical implementation of techniques or processes. It indicates the way in which a skilled personnel do their job. A person may make a fairly detailed written description of how to produce a particular result by a series of chemical

processes or reactions; but as all the world knows in practice. However, in spite of these difficulties, Perm Region the best result is obtained not by merely following all the directions in the book, but by the way in which the experienced person applies these directions.

Another class of such technical secrets ('know-how') is used to refer to disembodied information in the form of technical knowledge of industrial significance which has been built up in one organization and is not in the public domain. In this sense, the term relates to the application of technology in an industrial situation rather than to creativity. As such, know-how may comprise items of information retrieved from the general body of information which is available to all. Its importance lies, however, in the context in which those items of information are applied, and their collection as a separate entity which has acquired a significance and identity of its own. Know-how of this kind can constitute a trade secret, for, as an independent entity of information, it is inaccessible, and the law does not require any degree of novelty provided that information is inaccessible.

In 1994 the new Civil Code of the Russian Federation defined what a commercial secret is. Information can be defined as a commercial (trade) secret if it meets the following requirements: 1) it has real or potential commercial value, 2) it is unknown other persons, 3) there is no free legal access to the information, 4) the owner of the information does something to protect the information. Those who received the commercial secret illegally must recover the losses and pay the damages.

The Law on State secrets and the Criminal Code of Russia (1996) introduced into the Russian legal system the responsibility for the breach of confidence.

Russian legislation (the Civil Code, the Law on commercial secrets) makes no difference between trade secrets and know-how and this contradicts the norms of International Intellectual property law.

The described situation in Russia is worsening by researchers and inventors (about 80%), who do not understand the role and value of know-how in the world production, external and internal trade.

Trade secret (confidential information) protection gives an advantage over patent protection, which lasts only for a limited period of time (20 years).

#### V. INNOVATION ACTIVITIES IN THE REGIONS

Legislation acts of 37 subjects of Russian Federation regulate innovation policy in the regions.

The leaders of innovation activities among the regions are: the Voronege Region (30%), the Perm Region (26%), the Tomsk Region (17%) and the Udmurtia (16%). A special system of "technoparks" and "business-incubators" including 60 innovation enterprises (the production volume is more than 2 milliards rubles) was organized in the Voronege Region.

It is important to analyze the problem of Federal and Regional authority impact on regional innovative development in the case of Perm Region.

Perm Region is a traditionally industry-developed region with with a built-in effect of the military-industry complex and of powerful manufacturing. It is also a production region. with different raw material industries. As Russia as a whole, the oblast suffers from the difficulties of economic development, mass-unemployment burden, falling level of its citizens' standard of living and increasing ecological

is to be region-donor financing other regions of Russian Federation and its economic situation has been improved. As for general social-economic situation, Perm Region's macroeconomic indicators are better than in other regions: Perm Region occupies the 5<sup>th</sup> place among 83 Russian regions on the «alive» money volume. According to official statistics, Perm Region is included in to the group of «rich» territories.

The additional resource of government is social-economic policy. Being used it can provide solutions and perspective program goals of development. Nevertheless, it is necessary to form conditions for self-development of an innovation sector and rapid accumulation of its potential.

In this connection one more question arises – defining the place and role played by the government authorities in the innovative development process as a whole and by levels. This problem is closely connected with the optimal variant choice of carrying out economic changes in the country. There are two points of views on the trends of economic reforms in the country. The first one accents on market self-regulating processes, which allow to abolish anti-proportion in economy and make possible to balance production and consumption, to change them structurally and provide with scientific-technological and innovation development. Another approach supports active government regulation through supporting priority industries and enterprises. It is closely connected with the approach of polar development and defining the role of the government in the frame of such a concept.

The organization of effective mechanism of innovation development (and self-development) is impossible without establishment of defined «rules of the game» in the analyzed field. It is possible to point out that initiative «from the top» by the government side is limited and there is only a declaration of the necessity to provide active scientific-technological and innovation policy without adequate legal and financial support.

In these conditions, the priority necessity has the initiative «from the bottom», particularly in the field of creation and development of innovation activity infrastructure and transferring of knowledge and skills between different economic agents.

In the frame of such initiatives the authors of this paper carried out research and implementation of solving problems methods in the reform of innovation potential of Perm Region such as creating of science-technical and innovation activities infrastructure. Some of the difficult tasks in this field are:

1) identification of the main problems of concrete economic agents (forms and enterprises) in the field of science, technologies, techniques and innovations;

2) creation of mechanism (scheme of interrelationship) of different economic agents for organization of an effective process of spreading the scientific-technical and innovative information;

3) identification of regional and other levels of different economic agents that can be involved in such scheme;

4) Finding common points in which all participants of such a scheme are interested;

5) Creation of a mechanism of start financing for creation and improvement of such scheme;

6) Identification of the main elements of such scheme and to examine (to create) a scheme of flows of interrelationship between these elements.

It is possible to consider the development of the scheme of creation of innovation activities infrastructure in Perm Region, which would be adequate to the current necessities of free market economy.

This scheme could work if the economic agents included in it would receive advantages. The scheme of creation of effective infrastructure of regional innovation activities is very important.

The main strategic goal of the scheme is the development of innovation potential on the territory of Perm Region.

As the participants of such a scheme it is possible to include: regional local authorities (representatives and policy-makers); organizations of local self-management, scientifically organizations (universities, institutes of Russian Academy of Science, defense industry's technological bureaus and scientifically-research institutes, small enterprises of scientifically-technological industry, innovation technological centers and etc.); business (enterprises and different firms of real sector of economy, aimed on economic rent seeking, and consulting, educational and etc. firms), institutes of finance sector (banks, venture foundations, others finance institutes), non-profit sector (NGOs, NPOs, initiative groups of citizens, other forms of self-organization of population, included in solving problems of attractive participation of different groups in reforms, in carrying institutions of civil society, which helps to build strong legal society and the achievement of sustainable economic growth), different international funds [14].

The difficulty of uniting participants in an indivisible process of spreading scientific-technological and innovation information and knowledge lies in the necessity of the linkage of different interests, so called «civil cohesion.» The problem is that different social groups have their own particular interests, which is the element of institutional infrastructure of modern civil society: parties, trade unions, organizations of entrepreneurs, consumers, farmers, ecologists, legal-defenders and others are struggling for the budget share, for the participation in federal programs, for goals and priorities of economic policy as a whole.

Solving the problem of uniting the participants in the scheme is defined as the necessity to take into account the fact, that more optimal decision for realization of such plan is taking into account the profit reason and the demand of decreasing costs (private and social) for the conducting of innovative activities, increasing returns from R&D activities, and also the building of the society founded on democratic principals.

Therefore, for the solution of the problem of effective organization and providing with conditions of self-support and self-development of scientific-technological and innovation activities infrastructure it is important to define possibilities of different social agents for participation.

It is interesting describe the advantages and weak points and identify possible methods to be included in the scheme of every potential participant and also point out the main advantages received by agents from such collaboration.

The participation as an agent of innovative activities is profitable for the government because it allows to avoid the majority organizational problems in realization of programs

and develop scientific-technological and innovation activities. The participation in this scheme allows to minimize control for different program budgets. As a result there is increasing effectiveness of using budget finance, aimed at social requirements. Moreover, the total amount of investment of concrete inquiry may be increased partly through volunteers' activities. It is possible to calculate and evaluate the additional amount of money saved through using this way. Additionally, one of the important result of successful innovation activity of regional enterprises and firms could be considered as taxes flows to federal and local budget from innovative active enterprises [15].

Analyzing the motivation of local authorities in carrying out and development of innovation activities infrastructure, it is necessary to mention the form (type) of support for regional sustainable economic growth. However, this problem is not only from economic field but also from social one. It means that authorities are interested in regional labor mobility without big social catastrophes and without a decline of their economic situation.

There is also a related problem of social guarding of population. Solving this problem is such an objective necessity that provides with social equality in every social system. Such equality is the background of social stability, support of which is becoming one of the strategic goals of transition economy. Transition period and reforming process in Russia have sharpened the social-economic problems and new problems are still being added. At the same time deep worsening of general economic situation in the country has reduced enormously the possibilities for financing social programs from the government side. This creates additional difficulties in solving social significant issues. The key problem is becoming the organization of self-defending of the population with the help of the government in different social and economic forms [16].

The participation in this scheme is profitable for scientific and research organizations of all types, because of additional financing, receiving of the basis for practical implementation of discoveries and the possibility of fast commercialization of patents etc.

For firms the advantages from the collaboration could be considered as possibilities of receiving contracts from the government (guarantee demand); economy on applied research; decreasing of transaction costs; possibilities in increasing the product quality and its international standardization (it can allow to provide themselves with sustainable consumer's and investment demand); to conduct reconstruction of production process through implementation of ecological-safety and nature-saving technologies. In addition, of course, an important motivation of participation of private firms could be investment in such infrastructure and receiving profit from this activities (particularly, from the participation in commercial transferring of technologies).

Being included in this innovation scheme as participant of infrastructure it is profitable for non-government organizations (NGOs, NPOs), because of the additional advantages: receiving of additional finance aid, receiving of administration support, increasing of civil status of NGOs (NPOs). In addition, they receive possibilities to satisfy social requirements as the goal of their creation, mostly for different ecological movements, associations of consumer defense etc.

Participation of such collaborations gives advantages. Because of the creation of such infrastructure, inter-regional and international scientific-technological collaboration is possible. There is an increase of regional technological culture, ecological problems could be solved qualitative and complexly, and there are possibilities for a more effective control of the ecological situation and possibilities of fast adequate measures for its improvement. At last, the creation of such infrastructure is more profitable for innovators themselves (researchers, producers, and consumers of scientific-technological products).

The participants are allowed to solve one problem – recreation of the regional economy and decrease of social tension in society. Partly it depends as well from the government side as from the side of the society.

Including different agents in one process of creation and spreading scientific-technological knowledge and information, the experience skills, the number and the size of financing sources are increased. As such sources we can consider direct payment from the government budget; dotations, pensions, subsidies; tax privileges for enterprises with innovation activities; variety of non-budget finance sources (grants, aid, etc.); donations of enterprises and firms etc.

The main stage of such a project on creation and development of scientific-technological innovation activities infrastructure is the identification of priority fields of activities, and the development of take off activities. Proposals on cooperation could be addressed to such organizations, whose goal is socialization and being prepared for collaboration in any form. The main goal is to provide the agreement of necessity of the creation of such an infrastructure using the participation of enterprises and organizations (authorities, banks and organizations that can provide with start financing and active volunteers) [17].

The aim of such infrastructure might be consulting and interrelationship activities; training and re-training of the stuff; informational-analytical and technological services; marketing of high-technology products, providing commercial and non-commercial transfer of technologies; and also, possibly, search for investors for financing of more priority nature-savings, innovative, investment projects.

Today there are some assumptions for implementation of this idea in real practice. It was proved that organizations (institutions) unite people on the background of concrete social interests. Particularly, from the rank of local organizations that are interested in development of such infrastructure and able to participate actively in its creation we can mention the Chamber of Commerce, Ural NGO Support Center, Ural business incubator, Ural Small and Medium Enterprises Support Center and the Association of Industrial Enterprises of Perm Region.

However, not everything depends on local authorities, because the big amount of problems has national characteristic features and these problems have to be solved on federal level. There are such problems as: tax problems, legal guarantees of investment and problems of intellectual properties. Now in Russia issues related to the stimulation of innovation activities on federal level, are solved in the frame of Inter-Ministry's Program «Activization of innovation activities in Russian Federation».

The important problem of creating and development of scientific-technological and innovation activities

Government budget is not enough, but different funds support with financial aid only small investment projects. Today small enterprises can receive financial assistance only in the frame of «The Program of small enterprise and new economic organizations in science and scientific survives of High School industry Support», in Russian Foundation of technological development only under the condition of guarantees of third persons and for the enterprise development – in Support Foundation of small organizations in scientific-technological field.

It follows that it is necessary to establish special combined (government, private and foreign) financial institutes (funds, providing with grants or long-term without interest rates investment for the start period of R&D, guarantee foundations, which can allow small enterprises to receive long-term credits for finishing R&D and its further production, venture funds, which have shares in small enterprises under partnership conditions, etc.). Therefore, financing of infrastructure is one of the sharp and difficult for solving problems in current period.

As it has been already pointed out, one of the main problems of such infrastructure is providing spread and free access to informational resources. Now this access is rather limited because of the following reasons:

- small enterprises, as a rule, can't conduct permanent search of necessary information about market sources;
- payment ability of the main users of information, including small enterprises, is not very strong and this can be considered as the barrier of informational market development;

One of the ways that can help to overcome these difficulties is the improvement and creation of complex informational infrastructure of innovation activities.

In the current period uniting and structuring informational resources is carrying out on government level in the frame of the Inter-Industry Program «Fastening of Innovation Activities in Russian Federation». It is necessary to facilitate these activities also on regional level.

The main goal of proposed infrastructure activities is to provide the marketing of high-technology products. For successful commercialization of scientific-technological R&D it is necessary to have good knowledge of production process, possibilities of practical implementation of concrete discovery (i.e. consumers) and its commercial utilization. As a rule the possibilities of such implementation are rather narrow on the first step, especially from production-techniques side. That is why the return of first investment is not very high (sometimes with losses).

The only one way of solving this problem is the maximum extension of possible implementations of this innovation (sometimes it requires modification and other improvements of products themselves and production process). That is why the problem of effective marketing exists in the unknown for researcher fields.

Nevertheless, the problem of organization of effective marketing itself is faced with many problems. Particularly, there is no update working system of innovation marketing, because of the unstable economic situation and visible ignoring the problems of scientific-technological development from the government side. It creates the situation of non-attractiveness of this field for professionals. In addition, as the barrier of the development of this process, non-payment abilities of many enterprises can be

considered, as far as destroying many technological networks and chains. At last, non-predictable government practice of the system of the government contracts leads to conservation of many enterprises that can be included in the process of creation of difficult civil products [18].

Finally, the main stage of carrying out innovation activities' infrastructure is the creation of special institutions responsible for the coordination issues among different participants and for the organization to select concrete agents. Particularly, in the distribution of contracts on scientific researches and development specialized institutes (universities, scientific-research institute etc.) have to be taken into account. In addition, it is possible to arrange auction and competition on some issues such as training of the staff, consulting etc.

We can propose the establishing of such a specialized institution as the Innovation Center that can be considered as infrastructure organization with the main activity of complex of services for participants of innovation-technological cycles.

It is very important to take into account that effective activities of such a center would be visible expressed indirectly in most cases – through increasing of taxes for federal and local budgets from innovative active enterprises.

The more significant factors are: 1) Social-political situation in the Region; 2) Structural policy of Government; 3) Not-permanent relations with CIS-countries; 4) Level of competitiveness; 5) Local authorities' strategies. It proves the hypothesis that the level of regional authorities efforts are more significant than situation in Russia, tax policy and others as a whole and that is also important that federal government influence is more effective through carrying out of structural policy. That is why we can draw the conclusion that there are possible effective variants of combining federal and regional authorities efforts to facilitative sustainable economic growth of the region. Federal background has to provide Regional authorities to act in this field because their impact is more direct and stronger than the federal impact.

## VI. THE STATE INNOVATION POLICY

The state has to create a stimulating tax system in order to support the innovation activity in Russia. Property tax can become an important stimulating tax instrument able to cut down expenses on re-equipment.

It is necessary to intensify state science-technical policy and measures on high-tech industry support.

The task of innovation policy has to be the creation of sustainable and self-developing mechanisms that can provide development and effectiveness of scientific activities. It can be considered as production of intellectual products and its use. Therefore, the management of scientific and technological development has to provide achievement of these goals. Forming of the strategy is going on with consideration of existing conditions and interests of innovation policy and taking into account the innovation processes development in long run. The significance of this aspect can be explained by two main reasons.

- First, current formulating goals and priorities of innovation policy reflect the understanding of the up-date reality. During the region innovative potential development and economy as a whole, the goals of innovation policy can be essentially changed, because of transforming of

- Secondly, innovations are not decisions for one time and reproduction processes can be permanent. That is why all proposals for implementation and use of scientific technological improvements have to be connected not only technologically but also in time. Otherwise, modernization of production base can lead to so-called technological blind alley.

This is also the reason why the problem of increasing innovation potential effectiveness through fastening and coordination of linkages between federal and regional management in defining and coordination of regional innovative development strategy is actual. As research shows under current Russian conditions the central role in creating innovation policy has to be played by local authorities and its organizations. The special accent that can be done on regional authorities is caused by the reason that Federal Center is weakly interested in real growth of regions. Declared by the government the statement about the care of Russian regions are only words without legal, financial and other kind of support.

The losses for the regional budget are caused by negative and unexpected changes in federal laws.

It is supposed that the government has to realize its policy at the same moment in the fields of supporting innovators with financing resources; creating of suitable systems of marketing, consulting and engineering firms, investment venture companies and banks, stock-exchanges of technologies forming a comfortable market infrastructure, including federal (and regional) programs of creating of science-towns (technopolities), technoparks and free economic zones and so on; elaboration of united civilized rules and mechanisms of coordination of free decision-making for all agents of innovation market on mutual background for cooperation according to their interests on different stages of technological process. It provides with wide re-production of innovation and spreading of action of this mechanism for other spheres including first social field. It can allow talking about social innovations.

## VII. THE INFORMATION ANALYTIC RESEARCH SYSTEM "REGIONS' INNOVATIVE DEVELOPMENT"

Slow paces of development of the innovation activity in the Russian economy and connected with this failures in introduction of innovation arrangements are mostly caused by the drawbacks of the system of analyzing innovation processes both in the whole sectors of the economy and within the bounds of particular economic subjects.

Significant aspect of competitiveness management in any economic system is safe and highly-qualified tools of evaluating main indicators of system development and achieved results, possibility of comparing them with other subjects, as well as possibility of a constant control of dynamics and directions of changes in key indicators of development. Special urgency and complexity is attached to the evaluation of innovation competitiveness level.

The integration in common information space of available models and methods, their systematization, highlighting the main indicators of innovative development, as well as determination of integral indicator that characterizes the level of innovations are vitally important.

It is necessary to create a set of instruments and tools for conducting researches on regions' innovative

development, approbation of workable models and methods. The system should be used for accumulation, integration and maintenance of innovative development information. The complexity of the task is determined by the necessity of research integration in the sphere of innovative development theory and usage of up-to-date information technologies. This will provide the possibility of new research approaches to investigation.

Investigation of Russian and foreign methods of evaluating innovation potential and innovation competitiveness has shown a significant difference in approaches, as well as essential drawbacks of statistic account base [19-22].

First of all, it should be noted that there is an absence of methodological approach and a method of innovation competitiveness evaluation of economic systems in the Russian theory and practice. A level of innovations in business is considered through a level of enterprises' innovation activity, which, by turn, is determined by an indicator of innovation-active enterprises percentage. And here innovation-active enterprises are organizations that carry out development and introduction of new or improved products, technological processes and other kinds of innovation activity. Depending on a percentage of innovation-active enterprises in a certain economic branch (sector) Russian researchers speak about a level of innovation activity of a branch or of a whole region.

For a quantitative and qualitative assessment in Russian study on innovations researchers use such methods as: percentage of innovative products in an aggregate output; dimension of research and development costs; percentage of technological innovations costs in dimension of aggregate output; a number of introduced technologies; a number of created up-to-date technologies; percentage of innovation-active enterprises and others. However, all these indicators are examined independently and their interconnection and correlation are evaluated only through qualitative categories.

The analysis of foreign literature has shown that the majority of methods, which are put in practice in developed countries, is based on a set of similar indicators. For instance, within the bounds of the method of determining economic branches' and sectors' innovation competitiveness, which is common in the European Union (EU), an integral indicator is calculated instead of direct quantitative assessment of each innovation activity factor (method of State statistic committee). This indicator is a general outcome of innovation activity. As a result, with the help of UE method we can analyze the level of innovation activity not only of a particular branch, for example, cable branch, and compare it with a level of development in similar branches in other countries, but also evaluate a position of a particular enterprise in the branch, determine the difference between the innovation levels of different enterprises; point out those factors that are essential for a growth of innovation competitiveness, as well as factors that hinder enterprises' development.

In the Perm Region it was suggested to create a research system, which is aimed to integrate workable models, previously uncoordinated data, received from different sources in different formats (operational system data, accessible commercial data and others) into one storage, data coordination and further possibility of analytic processing.

The system should include statistic indicators, reports on evaluating innovations with the help of different methods, publications of different kinds on the matter, etc.

The research system should serve users' complicated requests both on search of necessary information and selection and processing. Different ways of forming requests, which will be available and handy for a user who is a specialist in a particular sphere, should be also provided. For introduction of research results there should be presenting information means in different forms (tables, graphs, diagrams, cartographical presentation, three-dimensional representation, as well as visualizing of models of different kinds).

In the Perm Region the research portal "Regions' innovative development" is aimed to develop and test the prototype of the information analytic system of collecting and processing data on regions' innovation activities to support efficient managerial decision-making. Data for analysis are gained from heterogeneous unstructured or semistructured resources, particularly, Internet-resources, as well as on-line data bases. The system should provide integration, matching, aggregation and maintenance of previously uncoordinated data. In the workable system there should be different forms of data and research results visualization that will meet users' needs.

The research system is a set of instruments for economic analysis of innovation activities of particular departments, organizations, integrations, economic branches, regions. The portal should provide the possibility of collective work of researchers, the possibility of testing available models and methods of evaluating innovative development and innovational activity.

One of the project's tasks is to develop a method of a complex assessment of region's innovation potential that will use economic and mathematical and statistic methods and models based on up-to-date information technologies and will help to determine a region's position among other subjects of innovation activity, mark out strong and weak points, compare advantages and disadvantages with main competitors (foreign and Russian), formulate main directions of innovative development.

It is necessary to provide the possibility of conducting analytic processing of received data, visualizing and comparing results, obtained from heterogeneous sources. Researchers should be able to have an access to the information, means of search and initial processing. The portal should provide these possibilities.

The main aims of the research portal are:

1. Computer-aided search of data sources among Internet-resources, devoted to innovation activity of particular departments and whole organizations, integrations, economic branches and regions, based on users' requests considering specificity of knowledge domain and its models.
2. Intellectual analysis, classification and cataloging of papers, gained from different sources, provision with easy-to-use navigation means for work.
3. Data gaining from received sources with the following matching and placing in one data storage.
4. Analytic processing of date placed in the storage.
5. Introduction of an access to the data storage with the help of convenient Windows- and Web-interface with a developed system of data visualizing and a handy set of instruments for creating reports.



TABLE I THE STRUCTURE OF THE INFORMATION ANALYTIC RESEARCH SYSTEM

6. Introduction of “portfolio” of economic and mathematical models of innovation activity with possibilities or editing available models of portfolio, development of new models by users and experimentation with the help of new models.

Users can exploit the system for analysis of available data, experimentation and approbation of built models and offered methods. Managers, analytics and researchers could use the system to analyze archival and operational data. The possibility of interpretation the most significant information is vital as well. The final goal of system introduction is to ease the users’ access to the necessary information with the view of using it in decision-making, as well as the possibility of users’ interaction in the process of investigations.

Creation of such a system presupposes the necessity of using technologies that allow creating flexible, dynamically adaptable system with a high degree of feedback. This will allow carrying out its operational adjustment in changing conditions and according to specific needs of different users [23].

Different researches on the matter are conducted in the sphere of information technologies, results of these researches are widely introduced in proceeding of conferences of different levels. Researches are devoted both to theoretical questions of creating adaptable systems and technologies, instruments (adaptability is investigated quite broadly: from the possibility of user’s interface adjustment to the possibility of whole restructuring, reengineering of a system). However, nowadays there are only few program products that meet listed requirements (particularly, MetaCASE). In Russia today there is an absence of industrial systems of such level.

Technologies of data storage, operational analytic processing and intellectual analysis, search and analysis of text and semistructured data sources, visual analysis should be used to develop the system [24-25]. Data analysis presupposes usage of economic and mathematical, statistic and econometric methods. It is planned to use statistic, ontological methods, as well as methods of recognition, structural and semantic text analysis for search and gaining data from text and semistructured data sources.

For carrying out the project experience of early conducted works is used, particularly projects of creating means of developing dynamically adjusted Web-oriented systems.

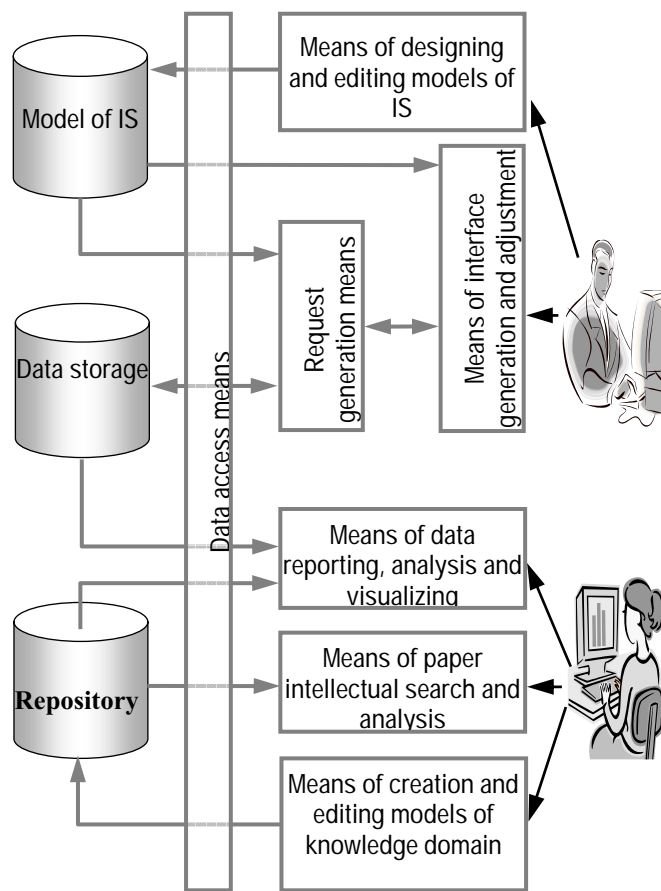
Table 1 demonstrates the structure of the research system.

System functioning is based on interpretation of multilevel models, metadata, describing the informational system (IS). Means of modeling, creating and editing IS models allow IS adjusting in changing conditions and in accordance to users’ needs. Metadata of different levels describe data structures, user’s interface and main IS functions. Changes in models lead to changes in system functioning. Adjustment can be carried out dynamically in the process of system exploiting.

### VIII. CONCLUSION

The authors come to the following conclusions.

1. For Russia it is the most essential issue to facilitate attention to innovative development and to forming an effective innovation potential.



2. The policy instruments to support regional innovative development can be classified as: federal and local authorities support of aggregate supply; federal and local authorities regulation of aggregate demand; providing of suitable economic climate in region; interface of federal and regional linkages.

3. Introduction of the Part IV of the Civil Code of the Russian Federation allowed to systematize the federal legislation on intellectual property. The basis of this system is recognition of subjective intellectual property rights for the results of intellectual activity and the means of individualization (for intellectual property) as exclusive ones.

4. The main stage of carrying out innovation activities’ infrastructure is the creation of special institutions responsible for the coordination issues among different participants and for the organization to select concrete agents.

5. Modern innovative and industrial development is elaborated from the regional level as the level of generating and providing different kinds of policies. In comparison with classical financial stimulus they have to use «soft» measures as information, transfer of technology, cooperation and organisation of networks.

6. Technological policy has just-in-time character from the shortage of theoretical background. Policy-makers do not pay a lot of attention to the internal circumstances, such as the demand of local industries and adaptation of institutional structure of the region to this demand.

7. The impact of regional authorities has features that are more positive and is more intensive.

8. The impact of federal authorities in practice is negative.

9. It is important to force the Russian region's self economic and political coordinating and it is important to provide decentralized innovative policy taking into account regional features.

10. The strengthening of the autonomy of regions has to be accompanied by creating suitable institutional structures, that can provide strengthening of political power and give the opportunity to coordinate different kinds of policies.

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