

## Formation of Network Model of Value Added Chain Based on Integration of Competitive Enterprises in Innovation-Oriented Cross-Sectorial Clusters

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### ABSTRACT

The relevance of the research problem is conditioned by the fact that currently in the global economy the strengthening of integration processes, increasing of inter-sectorial cooperation and the internationalization of economic processes are observed. Relevant and promising in this case is the formation of the network model of value added chains' creation based on the integration of competitive enterprises in innovation-oriented cross-sectorial clusters. The purpose of the paper is to develop model of competitive enterprises' integration in innovation-oriented inter-industry clusters, the formation of the algorithm for cluster's building and its capacity and activity strengthening, competitive enterprises' bringing on the level of innovative development. Leading method to the study of this problem is the method of building a spatial network model that allows realizing of economic entities' integration of different categories and types of activities in a generic inter-sectorial competitive cluster. To assess the effectiveness of the value chain creation the use analysis method is assumed based on value added, which allows to diagnose groups of competitive and non-competitive producers, to identify resource and innovative potential with further construction of development strategies. The research materials can be used in managing by the development of economic regional and cross-industry systems, clustering of the economy, as well as to assess the level of competitiveness of enterprises, the construction of strategies of innovation development.

### KEYWORDS

Competitiveness, cluster, value added, production efficiency, innovative development

### ARTICLE HISTORY

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## Introduction

### *The relevance of the study*

Currently, the strengthening of integration processes, increasing of inter-sectorial cooperation, the internationalization of economic processes is observed

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in global economy. In the next fifteen years there will be a change in technological structure, based on breakthrough technological achievements.

Change in technological structure leads to the paradigm shift of the development, which requires a qualitative change in the institutional system. In the context of global transportation and logistics and financial relations, deep integration of information technology in business processes, alignment of material conditions, building of a global communication environment, the internationalization of socio-economic system, the institutional system as a whole cannot be rigidly vertical. In the future taking into account global changes it needs to become "alive", with a predominantly horizontal interaction, which implies a high degree of freedom, transparency and flexibility of the interaction between institutions and actors.

Russia and its regions today are not fully ready for the challenge: their socio-economic strategies involve development within the aging paradigm. The current institutions do not encourage the growth of competitiveness, constrain the development of the new economy and impede the necessary transformations.

Relevant and promising in this case is the formation of the network model of value added chains' creation based on the competitive enterprises' integration in innovation-oriented cross-sectorial clusters. Cluster activation is aimed at creating conditions for the development of competitive clusters supporting the implementation of strategic goals of socio-economic development of the entities, improving of the competitiveness of the economy.

## **Materials and Methods**

### ***Research methods***

In the process of studying of integration processes, interdisciplinary cooperation, the internationalization of economic systems the following research methods are used: analysis of normative documents, functional analysis, prediction, systematization and generalization of facts and concepts, economical and mathematical modeling, projecting, method of graphic images, method of expert evaluations.

### ***Object and information base of research***

Object of research are institutional approaches to the formation of a state cluster regional policy, competitive enterprises and innovatively-oriented cross-sectorial clusters.

The investigation of the approaches and principles of state regional cluster policy are based on official regulatory documents and strategic planning documents of the Republic of Tatarstan. In the framework of statistical reports the data are generated about the volumes and dynamics of production, manufacturing of value added, innovative activity, structure of production costs and sales and their effectiveness.

### ***The stages of the research***

The study includes the following stages:

— the study of the theoretical aspects of integration processes, development of structural models for the integration of competitive enterprises in innovatively-oriented inter-industry clusters, the formation of the algorithm and

strengthening of the capacity and activity of the clusters, the determination of the bringing mechanism of the competitive enterprises on the level of innovative development;

— analysis of regional experience of formation of innovatively-oriented inter-industry clusters, the study of institutional approaches to the formation of a state cluster regional policy, assessment of the level of innovation of the functioning competitive clusters;

— study of the effectiveness of value added chains' creating using analysis methods based on the indicator of the value added that allow making diagnose of groups of competitive and non-competitive producers, identifying of resource and innovative potential with further construction of development strategies.

## Results

### *Modeling of competitive cross-sectorial clusters*

Leading countries and world growth poles actively use the cluster approach. Today in developed countries within the clusters more than 50% of the economy and over 40% of the workforce are formed. The initiators of the clusters are: business and government (30% of cases), and together business and government (about 40%). Financing of initiatives for the creation of clusters is carried out: by the state (about 55%), business (20%), a joint effort of business and government (over 25%). Presented data are supported by the Institute for strategy and competitiveness at Harvard business school and Center for strategy and competitiveness at the Stockholm school of Economics (Migranyan, 2013).

Taking into account the characteristics of development of the Russian economy, it is advisable for regions to use the approaches of the European and Asian models of clusters, suggesting:

— the creation of innovation clusters in conjunction with the existing industrial clusters in which the innovative potential of existing industrial clusters will stimulate the development of innovative clusters;

— the transition from macroeconomic management to the industrial, technological and cluster-based policy based on cluster activation using active methods of state intervention in economic development;

— active assistance of the state in expansion of domestic producers and promotion of domestic goods on foreign markets and protection of domestic producers from foreign competition in domestic markets;

— the trend towards inter-regional integration in the development process of cluster policy and regional initiatives;

— state policy in encouraging of the development of linkages between universities, research institutes and business and bringing in the centers of knowledge and entrepreneurship of large foreign firms;

— the formation of centers of competitiveness and high technology, science parks at the base and around urban universities.

— "pulling up" of the backward areas by forming of clusters based on innovative technologies;

— forming of cross-border clusters.

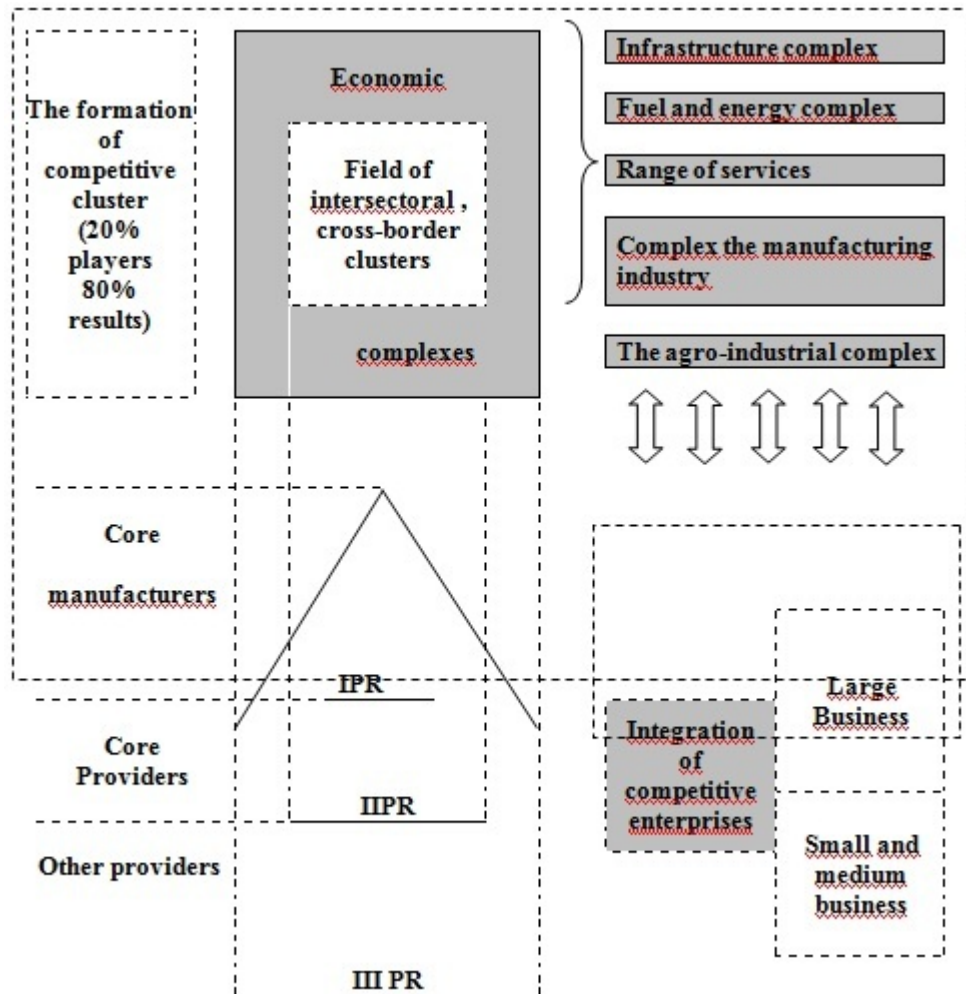


Figure 1. Model of integration of competitive enterprises in innovatively-oriented cross-sectoral clusters

In general, the formation of competitive clusters involves three stages:

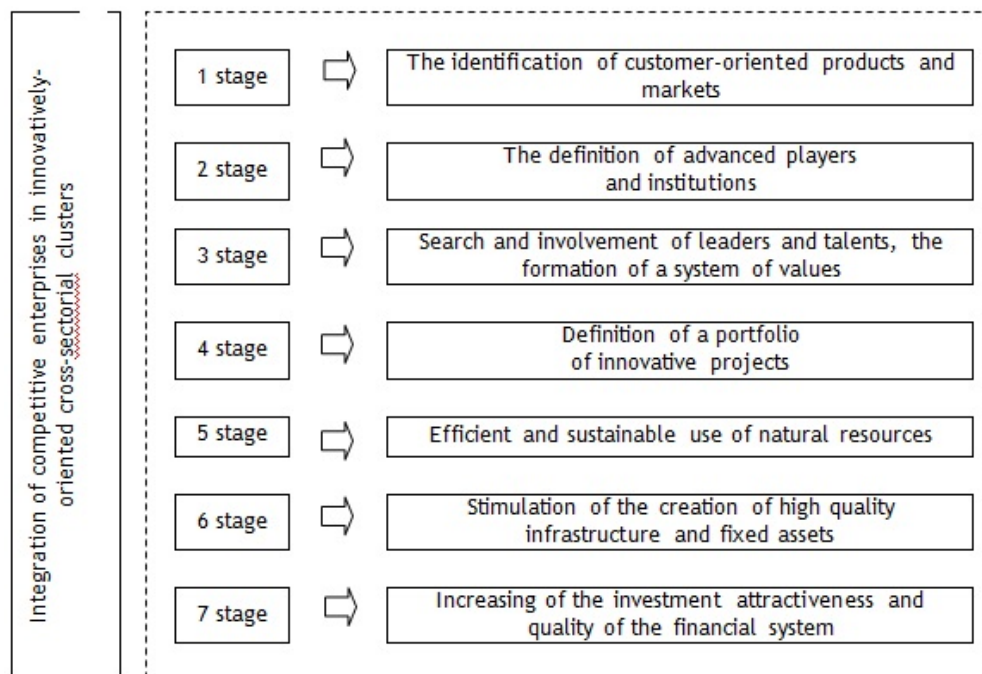
1. zone cluster activation: implementation of cluster initiatives at the level of three economic zones; identification of regional clusters with a high potential to become competitive at the interregional or global level;
2. regional cluster activation and alignment of the cluster system: development of basic clusters of "modern economy", as well as in conjunction with them of innovative clusters of "smart economy", able to be catalysts for changes, and in the future – full leaders of development;
3. the active phase of cluster development.

Cluster activation is an opportunity for business to participate in the development and implementation of crucial economic policies, to get the administrative, infrastructural, tax, financial state support. Obligatory condition for business's participation in the cluster activation is its maximum openness and engagement provided through the development and implementation of a package of strategic documents, allowing synchronizing of the development of

the republic and core business. Synchronization of scheduling is achieved by the clusters' core enterprises if they possess the portfolio of strategic documents with a horizon of 15-20 years:

- long-term strategic doctrine development;
- comprehensive business development plan based on the portfolio of investment projects;
- the strategy of innovative development;
- the strategy of improving of competitiveness (labor productivity growth and production efficiency);
- strategies of global promotion.

The algorithm or sequence of actions of the integration of competitive enterprises in innovatively-oriented inter-industry clusters consists of seven main stages that describe the development direction of the cluster formation.



**Figure 2.** The algorithm of integration of competitive enterprises in innovatively-oriented cross-sectorial clusters

Each of the areas provides a number of specific actions aimed at achieving the goal. So, stage 1 "Identifying of customer-oriented products and markets" includes the following steps:

- Definition of a portfolio of competitive products in the cluster.
- Diagnostics of markets. Development and implementation of programs to promote cluster products.
- Development and implementation of the program of cost optimization in the framework of the cluster products.



Stage 2 "the definition of the advanced players and institutions":

— Identifying and support of leaders-generators of cluster development. Identification of core cluster members.

— Synchronization of strategies and business plans of the members of the cluster.

— The development and implementation of state programs of complexes development within which the clusters are developed), fixing the strategy of cluster development and government support mechanisms.

— Implementation of the system of optimization/reforming of business of core participants in the cluster

— Contributing to the efficient cluster cooperation of cluster members among themselves and with the world's leading companies.

— The definition of institutions of cluster's development (Institute of development, engineering center, direct investment Fund).

— Implementation of an institutional program for reducing of administrative barriers.

— Encouraging of cluster's participants in inclusion in the international division of labor, attracting of international business and technology partners.

Stage 3 "Search and attraction of leaders and talents, the formation of a system of values":

— Formalization of requirements to the cluster's specialists.

— Formation of system of values and norms of ethics in the cluster.

— Attraction and retaining of the best leaders and talents in the cluster.

Stage 4 "the Definition of a portfolio of innovation projects":

— The formation of the list of core innovations of the cluster.

— **The launch of the triple helix: business – science – government.**

5 stage "Efficient and sustainable use of natural resources":

— Definition of a set of resources and the needs for enterprises and projects of the cluster.

— The formation of the environmental standard of the cluster.

6 stage "Stimulation of the creation of high-quality infrastructure and key assets":

— Formation of the list of infrastructural constraints in the development of the cluster.

— Formation of a portfolio of priority infrastructure projects of the cluster.

— Encouraging of the development of existing and creation of new objects of innovative-investment infrastructure: development zones, industrial and technology parks. The creation of specialized engineering centers (with the creation within them of commercialization centers, and centers of tests and certification of products and Experimental Design polygon).

7 stage "increasing of the investment attractiveness and quality of the financial system":

— Formation of the investment portfolio of priority projects of the cluster.

— Development and implementation of the program of investment promotion of priority projects of cluster development.

— The development and implementation of the program for support of investment attraction (financial and strategic) in the priority projects of the cluster.

— Provision of priority state support for cluster members (tax, financial, infrastructural and administrative).

— Monitoring and evaluation of the effectiveness of the level of cluster development.

Modeling of innovatively-oriented inter-industry clusters through the integration of competitive enterprises is possible in conditions of industrial evolution. In this case, a model of transition from a temporary restriction of competition or import substitution through the promotion of the development of local production to export-oriented development on an open high competitive market is considered. Temporarily limitation of competition is advisable only in those areas where in the future a high export potential is predicted.

### *The study of the regional experience*

In the Republic of Tatarstan a state cluster policy is aimed at encouraging of the competitiveness and economic growth through the modernization of the "modern economy" and creating of a "smart economy". Cluster activation is one of the core directions of the strategy of socio-economic development of Tatarstan Republic till 2030. The basic principles of cluster policy of the Republic of Tatarstan are the following:

1. Cluster activation is aimed at creating of conditions for the development of competitive clusters to support implementation of strategic goals of socio-economic development of Tatarstan, the promotion of competitiveness of economy of the Republic of Tatarstan in general.

2. The strategic objectives of the clusters, i.e. the achievement of greater competitiveness, increasing of market share, complement and reinforce the strategic objectives of the region, providing the global leadership of Tatarstan through leadership of the clusters.

3. Cluster activation policy is focused on priority directions, capable to ensure economic growth and high competitiveness in interregional and international markets.

4. Cluster activation is based on public-private partnership, promotes industrial evolution, is implemented in the framework of the management system of the future "Galaxy".

In the Republic of Tatarstan in the first stage of the cluster activation it is expected to develop current experience of the Kama cluster based on the implementation of cluster initiatives in the framework of the three economic zones with a focus on the formation of the core fuel - energy - chemical cluster. On the second and third stages a special attention will be given to innovative clusters of "smart economy", which in contrast to the clusters of "modern economy", are to produce not only competitive, but also radically new products, materials and technologies.



At the initial stage of cluster activation it is necessary to carry out modernization in the framework of the "modern economy", implementing several high-tech projects and measures for the modernization and increasing of the competitiveness of the economy:

1. The "Tatneft" group - development of bitumen oil production based on their own technologies.

2. The company "TANECO" – launch of new industries such as hydrocracking, production of base oil, complex for processing of heavy residue. Expansion of production capacity within the next phase of project development.

3. "TAIF" group – construction of complex of deep processing of heavy residues "TAIF-NK". The implementation of the project of the new ethylene complex with 1 million tons at "Nizhnekamskneftekhim".

4. The company "Ammonium" - nitrogen fertilizer production.

5. Group "KAMAZ" – the implementation of the program of production's full modernization and transition to a creation of prospective family of vehicles that meet global standards.

6. Association "Kazan helicopter plant" – the production of new models in the segment of light and heavy helicopters.

7. The plant named after A.M. Gor'ky – the construction of modern high-speed passenger ships and ships for the Navy.

8. The implementation of major investment projects by agricultural holdings: the launch of new production of poultry meat (JSC "Agrosila Group"), the doubling of production capacity (LLC "Kama bacon"), increasing of the production of meat and dairy products with their own processing (JSC "Holding company "Ak Bars"), the creation of Russia's largest complex for the production of goat milk, the expansion of greenhouse agriculture (JSC "TK "May"). Further development of agro-parks in Kazan and Naberezhnye Chelny.

9. Implementation of regional programs of support for rural settlements: road construction, rural health posts, village halls, sports grounds, strongholds for police officers and the restoration of street lighting, the program "Clean water" and other programs. The development of family farms, personal households and other small farms. Creating of structures that enable farmers directly to sell their products to consumers. The formation of integrated production chains, including through the pooling of regional agricultural producers under a single brand "Tatarstan. Clean food". The achievement in production of agrarian and industrial complex of high standards in quality and packaging.

10. Stimulation for increasing of the presence of the Tatarstan agricultural producers in retail chains (including through the promotion of commercial networks to facilitate access for producers from the Republic of Tatarstan). Promotion of new technologies on the basis of interaction "business-science-state", highlighting the special role of science (applied nature of R & d and innovation in the agricultural sector).

Increasing of the competitiveness depends on improving of productivity and energy efficiency. Today, according to indicators Tatarstan lags behind the leading countries in the world. State energy efficiency program and the Program for improving of the productivity in the petrochemical and machine-building



complexes still do not bring tangible effect. This is due, primarily, to segmentation of the application of mechanisms to improve the efficiency, as well as to the lack of consistency of the process.

Mechanisms of cluster activation should be clearly stated in the state programs of development of basic economic complexes, there is a need in the focus on the modernization of the "modern economy" and creating, in combination with it of the "smart economy". Such state programs must be developed for the period till 2030 for the fuel-energy-chemical complex and the manufacturing industry, as well as the state program of development of agriculture complex must be updated and finalized. It is also necessary to provide synchronization of a set of state programs for infrastructure complex development and services' complex of the Republic of Tatarstan until 2030.

Cluster activation on the national level will create a new Foundation for economic growth, ensure modernization of facilities, introduction of new technologies, new equipment, implementation of programs and projects in the field of innovative development. Cluster activation is the stimulus to move for the economy to a higher way of life (Tsikhan, 2013).

The study of state and regional experience of implementation of policy of import substitution has allowed highlighting of the advantages of "industrial evolution," which can be contrasted with a closed industrial model, designed for a long economic isolation. So, in Tatarstan annually goods on more than 350 billion rub. is brought in, indicating the economic opportunities of import substitution and importation of products from outside. The development of the domestic chain "manufacturer – supplier" will increase the share of processing of its own raw materials and thus increase the value added in Tatarstan.

In the Republic of Tatarstan for several years a cluster approach is implemented, the Kama innovative territorial and production cluster is created (Kama cluster). In the long term Kama cluster is identified as one of the main points for growth of economy of the Republic. Implementation of investment projects of the cluster will allow tripling the volume of industrial production and bringing it to the level of 2 trillion rub. An important role in the development of the economy of the Kama cluster is given to the special economic zone "Alabuga", on its territory already 13 modern factories operate and investors invested more than 70 billion rubles, created 45000 jobs. It produces high-tech products, aimed primarily at import substitution.

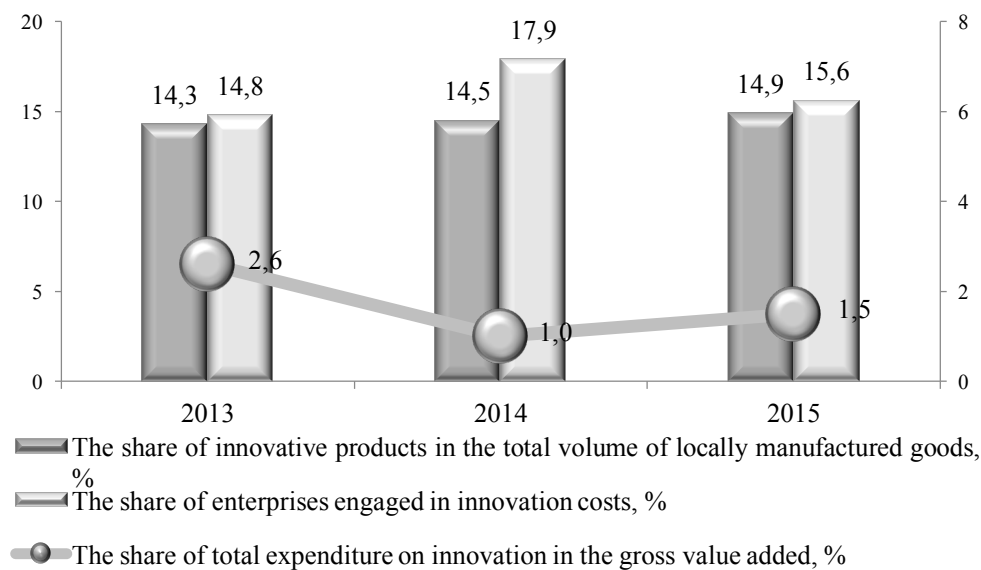
In the modern economy the traditional division of the economy into sectors or types of economic activities loses its mobility. First place belongs to clusters – relationships' systems of firms and organizations, the significance of which exceeds a simple sum of its parts. This is the most effective organizational form to achieve a high level of competitiveness, accelerate innovation activity, enabling more quickly and efficiently distribute new knowledge, scientific discoveries and inventions; focus on business processes that provide the highest added value, passing the rest to outsourcing, effectively attract and use of investments (Luksha, 2010).

Foreign experience shows that the tool for support clusters are technology platforms. In Russia the platforms initially were not considered as one form of clusters' development. Over time, they gained not only sectorial but also territorial focus, and had the opportunity to raise the level of relations of the actors of the innovation system within the cluster. As it follows from the review



of international experience, European standard algorithm for the formation and operation of technological platforms is divided into three main steps. The first step defines the priorities which actually define the topics of the clusters. In the second stage “the road maps” of the platforms are developed. The third starts the implementation of projects, including research and developments, which are financed from different sources (Kozak, 2012).

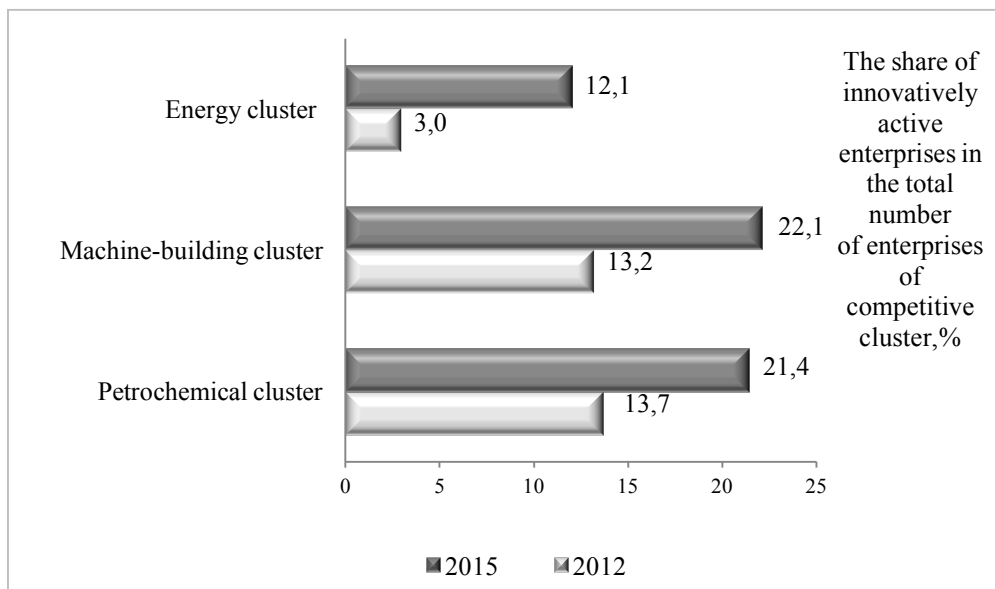
Analysis of innovative potential of the Republic shows that in Tatarstan there are preconditions for activation of the innovation process, manifested in the significant scientific and industrial potential of enterprises and organizations (Fig. 3).



**Figure 3.** The level of innovative activity of competitive enterprises - potential participants of competitive clusters of the Republic of Tatarstan

In Tatarstan there is a rapid growth of innovative activity of the enterprises, included in the industrial (sectorial) cluster. Three major industrial clusters are formed in the republic: petrochemical, automotive, and energy. The cluster includes a group of geographically adjacent interconnected companies (suppliers, manufacturers etc.) and related organizations (educational institutions, research centers, state administration, infrastructure companies) operating in a certain area and which are complementary to each other. A modern approach to the formation of clusters is based on the partnership of business, Federal, regional and local authorities. The state is interested in the global competitiveness of its economy, resulting in the provision of various forms of state support in the framework of realization of strategy of territories' development. Core clusters (petrochemical cluster, the automotive cluster and the energy cluster) involve the scientific, educational and industrial organizations. As practice shows, cooperation of scientific institutions and enterprises is most effective if they operate within the same cluster. Innovation clusters become a kind of "platform" on which a continuous interaction of financial and intellectual capital is carried out.

On the other hand, the main criterion of cluster policy is competition – increases the number of innovatively active enterprises and stimulates other enterprises of the cluster to innovate. So, in the automotive cluster in 2015 the share of innovative enterprises in total volume of enterprises of the cluster was 22.1%, in petrochemical – 21,4%, energy – 12.1 per cent (Fig. 4).



**Figure 4.** Dynamics of the level of innovativeness of competitive clusters of industry of the Republic of Tatarstan

In effectively functioning innovation clusters the innovation process is accelerated, contributing to the development of cluster participants' benefits such as susceptibility to innovations, rationalization of the business, outpacing productivity growth, etc. In this case, the cluster acts as a technological platform as a basis for the development of innovation. To determine the contour of the cluster the criteria for the occurrence of the enterprises in the cluster are defined taking into account the concentration of production of profile products, as well as the enterprise's sufficient capacity for the implementation of cluster initiatives that require certain financial costs, adequate perception of innovative and investment policy, using tools of industrial cooperation (outsourcing, franchising, etc.), export orientation, and so on.

### ***Evaluation of the effectiveness of value-added chain creation***

Currently, at the reforming stage of the role of government in market mechanism, the range of economic indicators in the domestic theory and practice combines both shades of classical political economy and ideas of modern Western economic thought. According to financial concept the value added indicator includes the value of the gross income to pay for factors of production. In accordance with the system of national accounts, the main indicator of economic development of the region is the gross regional product. This indicator, measuring the end results of economic activities of the region, is used to



characterize the economic power and level of economic development of the state, to evaluate economic growth.

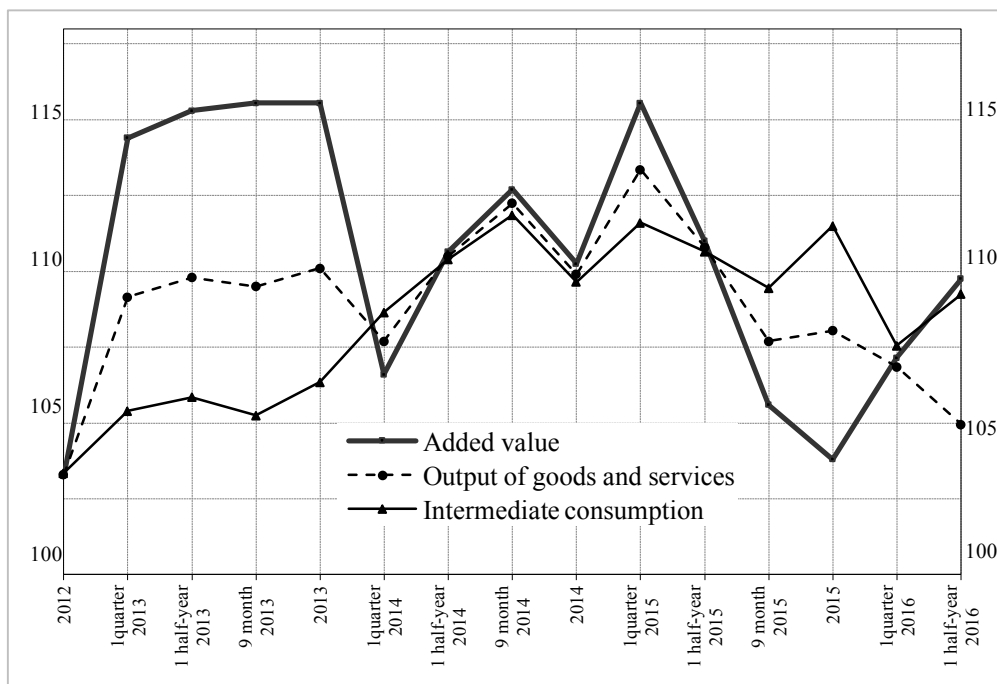
The basis of the gross regional product is the value added of economic entities of the Republic. This is one of the main indicators of economic analysis to analyze the efficiency of individual enterprises and the structure of the value added by types of economic activity. Value added represents by itself a newly created value, without the cost of someone else's labor, defined as the difference between output of goods and services and the cost of consumed material means of production and services of other organizations or intermediate consumption. Intermediate consumption includes the cost of goods and services that are transformed or consumed fully during the production process. It is a part of the total cost, including manufacturing expenditures, administrative and selling costs associated with the production. Those costs which are expended on production, but are not obtained from the side, are not intermediate consumption: costs on wages, depreciation of fixed assets, taxes included in the cost of production. In national accounts they are in the "revenues," i.e., value added.

The indicator of value added, as a reflection of the newly created at the enterprise value and, therefore, the gross income of the producer is of great importance for the analysis of performance, business activity, competitiveness, the dependence of the enterprise from the external environment. The analysis of the dynamics of value added production allows evaluating of the effectiveness of the network structure of the cluster in the following areas:

- determination of the of individual enterprises' contribution to sectorial (regional) production of goods and services in an industry-wide (regional) added value;
- comparison of the share of value added in output of goods and services by economic entities in one activity in order to identify inefficient industries;
- to determination of the effectiveness of production factors' use; grouping of activities on a set of attributes;
- analysis of the structure of value added by the sources of its formation: the proportion of the costs on labor wages, depreciation, ROI of added value.

Indicator of economic activities' efficiency of enterprises and organizations is the value-added ratio or the share of value added in output of goods and services. The high value of this indicator shows the effectiveness of network of businesses, stable position of the cluster. Since the main factor influencing the increase in profit received by the enterprises, and thus the value added cost is the cost reduction in the production of products such indicator as efficiency of material costs, determining the amount of their assets for one ruble of output of goods and services is of great interest.

Supplement of systems of economic analysis by the value added extends opportunities for evaluating of the effectiveness of management organizations. The definition of gross value added and gross domestic product is a necessary condition for the analysis of trends in macroeconomic development. The value of analytical aspect of the added value lies in its multi-level use: in the management of micro-, mezzo - and macroeconomics, as well as in their combination. It should be noted that the orientation on value added does not mean ignoring of the indicator of commodity output. Commercial products reflects the amount of the transferred and newly created value in the amount of the product and serves as the basis for calculation of production costs, working capital turnover, profit and profitability. Added value allows you to analyze the amount of, on the one hand, private costs that occurred in the organization and the economy as a whole, without regard to past labor, on the other hand, income received by the organization and the economy as a whole and its distribution, thereby increasing the analytical value of the analysis.



**Figure 5.** Dynamics of value added production by enterprises of competitive clusters of the Republic of Tatarstan (in percentage to the corresponding period of the previous year excluding inflation)

In the 1st half of 2016 at the enterprises of large, medium and small businesses of the Republic of Tatarstan the growth rate of value added amounted to 108.5% in current prices without inflation. The share of added value produced by small enterprises, in the value added of large, medium and small enterprises amounted to 19.2%. More than 85% of the value added of the Republic is formed by a competitive enterprise of the petrochemical cluster. The current level of oil prices in the world markets of fuel and energy resources determines the overall situation in the Republic. The average price of oil in



January-June 2016 amounted to 103% of the level of January-June 2015. The volume of oil extraction and production of petroleum products in physical terms increased in the 1st half of 2016, compared to the same period in 2015, respectively, 3% and 18%. Taking into account these factors in constant prices manufacturing of value added in the Republic of Tatarstan amounted to 108.5% of the previous year (Fig. 5).

About 3/4 of the added value of the Republic is traditionally made by large and medium industrial enterprises (mining, manufacturing, production and distribution of electricity, gas and water). The tenth part of the value added is created in the enterprises of transport and communication, 4% - in the organizations carrying out operations with real estate, rent and granting of services, 3% - in construction, agricultural organizations, enterprises of wholesale and retail trade. The proportion of other industries does not exceed 1%. For the period 2012-2016. sectorial structure of added value has undergone the following changes: the share of industry and construction decreased, respectively, by 5.4% and 2.8%, with the growth of the specific weight of communication enterprises (2.1 times), housing and utilities (2.4 times), transport (3.8%), agriculture (10%). In 2016 vs 2015 with a slight decline in the share of value added of the enterprises of mining (48% in the year 2016, compared with 51% in 2015), the rise of the value added of manufacturing was observed (23.4% in 2016, compared with 21.5% in 2015). In the energy cluster organizations, the value added in 2016 at current prices on 4.5% is lower than in 2015.

A significant proportion of added value of manufacturing productions is formed by the enterprises of petrochemical cluster, namely in the chemical industries (29,3%), production of petroleum products (9.6 %), in manufacture of vehicles and equipment (22,2%), in manufacture of machinery and equipment (10.1 %). In 2015 and 2016 the growth rate of value added in the industrial clusters amounted to 126.8%.

The change in production structure of value added by economic activities and industry clusters and the growth of value added can be associated not only with changes in volume of output of goods and services and production efficiency, but also with such factors as:

- the natural movement of the economy (formation of new businesses, the elimination of bankrupt, change their core activities, restructuring of enterprises etc.);
- small business development, growth of business structures;
- level of producers' prices by kind of economic activity, including changes in the price of oil and oil products.

**Table 1.** Parameters of efficiency and competitiveness of the network structures of core clusters and enterprises of the Republic of Tatarstan

The level of competitiveness	Enterprises' entry in the cluster	Production efficiency (the share of value added in output of goods and services, %)	Profitability of value added (the share of profits in value added, %)	Social efficiency (the share of expenditure on wages in value added, %)
High	Petrochemical	43,9	45,9	11,4

competitiveness	cluster			
	Engineering cluster	45,6	39,1	13,2
	Energy cluster	40,8	40,4	9,7
Low competitiveness	Enterprises outside the cluster	29,0	8,1	50,5

Analysis of the competitiveness of industrial clusters is realized through a set of performance indicators, dynamics of production, price characteristics. The most common approach is to bind the competitiveness to the indicators of enterprise's productivity such as labor productivity, capital productivity, efficient use of tangible and intangible resources etc. Analysis of mutual correlation of indicators eliminates unnecessary non-informational elements and allows operating only by statistically significant.

Characteristics of production efficiency and labor productivity are estimated on the basis of value added. As the characteristics of the competitiveness of goods their efficiency (the share of value added in output), profitability of value added (the share of profits in value added) and social efficiency (the fraction of the cost of labor in value added) are given. To assess these indicators their change, or growth rate are accepted, since the difference of indicators by types of activities is largely determined by sectorial specialization and depends on the type and range of products and services, which in turn vary by the limit content of value added. Thus, the analysis of the table shows that the greatest level of efficiency and profitability of production is observed by companies organized in a network structure or clusters. Much less indicators of economic activity belong to enterprises of the same types of activities, but outside of the cluster.

## Discussions

A previous study conducted by A.M. Kireyenko (2010), V.V. Krivorotov (2005), B.J. Tatarskikh (2011), A.I. Shinkevich & E.A. Vardanyan (2013) is devoted to the theoretical bases of the competitiveness of micro - and mezzosystems. To the study of institutional approaches to the formation of clusters the works of A.A. Migranyan (2012), M. Porter (2004), T.V. Tsikhan (2013), I.V. Yarmukhametov (2014) are dedicated. A comprehensive study of the competitiveness of Russian industry is reflected by the authors K.R. Gonchar & B.V. Kuznetsova (2008), T.V. Malysheva, V.P. Kandilova & V.A. Nikolaeva (2015).

However, the quantity of scientific and applied works, dedicated to the integration of competitive enterprises in innovation sectorial clusters, the research methodology of the competitiveness of the network structures on the basis of the value added is extremely small, and the existing works are only of theoretical nature. The studied aspect in previous research was not considered.

## Conclusion

Thus, the aim of the uniting of competitive enterprises in innovatively-oriented clusters is to achieve certain positive economic effects arising from the



consolidation of the industrial, financial, labor, scientific, and management resources. The combination of these resources determines the capacity of the organization. When companies merge, the total capacity may be increased proportionally to additional resources. Accordingly, while creating integrated corporate structures obtaining of positive synergistic effects is expected due to disproportionate growth of the capacity of the organization.

To obtain the desired synergy effect while creating network models of innovation clusters it is necessary to conduct a comprehensive study of the process of integration that will determine the direction, methods and forms of the most effective integrated relationships.

Implementation of the Strategy of socio-economic development of the Republic Tatarstan and its Central economic process involving the integration processes requires appropriate institutional reforms, the completion of the control system, the establishment of a system of bodies responsible for the implementation and updating of the Strategy and particularly the monitoring, coordinating and stimulating of actions of all stakeholders. Perhaps it may be a specialized structure, coordinating the process of implementation of the policy of cluster activation of the economy in the region. This structure must use project-based approach, involving to the implementation of project quality stakeholders and experts to achieve "the result", which is defined for each project as a set of core performance indicators. Achievement of core performance indicators will be the basis for compensation from the investments, which can ensure the self-financing of the structure. The competences' center should accumulate the best practices to achieve results and to create a database of regional case studies with a view to their replication in the framework of the priority activities and projects.

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