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Information Technology Cluster in Kaliningrad Region: An Eternal Initiative or a Launch Pad?

Andrey Sergeevich Mikhaylov*

Immanuel Kant Baltic Federal University, Kaliningrad, Russia
*Corresponding author: mikhailov.andrey@yahoo.com

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Abstract The paper presents an empirical study on IT cluster initiative in Kaliningrad region, which by 2015 'celebrates' its fifth anniversary. By conducting multiple interviews with representatives of the regional IT business community, local government authorities, and knowledge institutions, we examine how much progress has been achieved in establishing a full-flagged regional IT cluster. Research results suggest that an industrial approach towards formation of a cluster, as well as a broad view over IT sector is not conducive to the establishment of strong ties among a heterogeneity of actors involved in a cluster. The IT cluster initiative in Kaliningrad region has fragmented into a number of isolated initiatives driven by business community and build upon proximity of individuals' aspirations. Regional authorities are inclined to neglect this disjunction and tend to follow their strategic objectives unchanged.

Keywords: *IT cluster, Kaliningrad region, cluster initiative, proximity of aspirations, informal institutions, organized cluster, planned cluster*

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1. Introduction

According to a vast majority of scholars, cluster initiatives are able "to unlock the potential" [[19], p.5] of the existing or emerging regional competences and specialities [4,27,37]. Networking within a cluster increases operational efficiency, productivity, innovativeness, and flexibility of interconnected companies and institutions [3,16,33,34,52], whose mutual "strength is heightened by geographic proximity" [[36], p.144]. A matter of 'co-location' [52], the notion of just 'being there' [12], can hardly be regarded as the backbone of the cluster. Researchers advocate that cluster is all about 'untraded interdependencies' [46], 'non-market links' [[9], p.22], 'knowledge sharing and interactive learning' [[21], p.4], as well as institutional relationships [39] and value-adding production webs [11]. Timothy Bresnahan and Alfonso Gambardella [6] have noted that little is known about why and how clusters emerge. A growing body of literature on relational proximity (i.e. cognitive, cultural, institutional, organizational, social, and technological proximity [5,13,39,45,50]) suggests that clusters are shaped by shared business culture, organizational and technological processes, institutional architecture, mutual problems, believes, and aspirations 'embedded in a social context' [15] and laid down in 'historical circumstances' [37]. Acknowledging the tacit (i.e. implicit) nature of clustering antecedents, Miller and Côté [[28], p. 41] note, "each cluster seems to call for a distinct explanation". Thus, there can hardly be elaborated an optimal and unified way to generate new clusters [4].

However, based upon classification of clusters' path dependency (i.e. emerging, existing, or regressing clusters [52]), the informal institutions, as redefined by Richard W. Scott [41], can be traced and analyzed. According to [31,41], normative and cultural-cognitive dimensions constitute informal institutions and are tangible (i.e. objective) while being internalized by the majority of actors in a cluster [14,31]. The aim of this paper is to analyze the institutional aspect within an IT cluster initiative in Kaliningrad region as to allocate its current state of systems' unity and the prospects for its future development.

2. Cluster Initiative – the Phenomenon of Manmade Cluster

2.1. At the Intersection of Individual Aspirations

The phenomenon of organized [22] (i.e. planned [23,43,44], or engineered [2]) cluster suggests that clusters as spatial networks of cooperating, competing and collaborating actors (see [35]) can be created artificially via purposeful actions – cluster initiatives. Various approaches to cluster initiatives were conceptualized in different models – Australian, Baltic, British, and North-American [10,26]. These models mostly deal with the differences in terms of formal institutions (i.e. funding,

supporting organizations, laws and regulations, etc.) at the stage of emergence. The following stages, such as development and maturity, on the other hand, demonstrate the diffusion and absorption of knowledge (see the concept of 'knowledge interactions': market linkages, knowledge spillovers, formal and informal collaborations [49]) within the virtual space of a cluster. Active inter-organizational relationships and knowledge-sourcing shapes the informal institutions (e.g. conventions, customs, everyday practices, expectations, habits, norms, routines, rules, shared logics, common beliefs, and values) of a cluster [47,48]. Cluster members (i.e. 'intermediaries' [42]) seek to absorb a broad set of heterogeneous competences, knowledge and information available on the market as to assimilate and integrate it for the sake of commercial ends [7,40]. Finding complementarities is of particular importance in a cluster, enabling it to achieve synergies and form unique emergent properties. Scholars suggest that complementarities are the main driver of cooperation and are of vital importance to competition, being responsible for the long-term growth [24,37;,51]. Complementarities and commonalities, not being constrained by industrial or national borders per se, enable intra-regional networking and reduce cumulative cost and risk associated with R&D [24,29,37]. Whereas, shared knowledge and technologies, linked by commonalities and complementarities, boost informational and transactional efficiencies [38].

Following the statement of Lämmer-Gamp and colleagues that "clusters are individuals" [20], it would be right to say that commonalities and complementarities are the intersection of individuals' aspirations. It is individuals who are responsible for the knowledge to be generated, commercialized, and diffused [25,32]. Day-to-day interactions between different actors in a cluster enable individual employees to advance in their duties, as well as acquire gains over personal aspirations (e.g. income, knowledge, promotion, glory, etc.). Strong sustainable clusters form out of like-minded individuals, who speak the same language (i.e. solidarity), able to build trust and strong ties of a multi-scalar network [1,8,17].

2.2. Cluster Initiatives in Russia: at the Start of a Long Way to "Tipperary"

Organized clusters (being a result of specific policy initiatives) are seen as one of the key priorities by the state (see Note 1). State authorities have allocated a number of policy actions to create an enabling environment for the cluster development, offer support to cluster projects in priority areas of specialization (see Note 2), with a special focus on improving the competitiveness of cluster members, methodical, informational, and educational support for the implementation of regional cluster policies.

The reference point on the national cluster initiative is the creation of the NGO "Center of cluster development", initiated by the Ministry of Economic Development in 2010. The mission of this center is to provide support and coordinate projects for the formation and development of clusters in the regions. More specifically, the Center is focused on the identification and benchmarking of clusters, assistance in building an organizational structure of a cluster (the paper work), mediating its institutional helices (business, government bodies, educational and scientific institutions, local community), providing a knowledge-sharing platform (e.g. conferences, seminars, workshops, training programs, etc.) and start-up support.

By the March 2012, the first phase of the national cluster initiative program was launched. Just over a one-month period, 94 applications for the cluster initiative project from all over the country were received. Most project areas were in the field of life science (18% of all applications) and ICT (about 13%). The share of other areas was insignificant – from 1 to 4% of the total number of applications. Based on a vigorous selection process, a total number of 25 projects received the state support, only one being from the Northwestern Federal District – a life science cluster in St. Petersburg.

Regional government of Kaliningrad Oblast (i.e. region) has elaborated an independent development strategy, which sets a long-term objective to establish four regional clusters based on core regional competences: tourism, amber, automotive, and IT. The main instrument for implementing this "ambitious plan" is to create large 'anchor projects', such as construction of infrastructure facilities (e.g. IT technopark "Kaliningrad", IT city for programmers "I-CITY", etc.). We hereby will focus on IT cluster initiative, on the antecedents and prospects of its development.

3. Research Methodology

Present research is designed as an in-depth case study based on expert interviews, as well as analysis of primary and secondary data. A series of interviews held in July – October 2013, enabled capturing individual perceptions over the IT cluster initiative in Kaliningrad region from different institutional perspectives – regional authorities, knowledge institutions, business community. A total number of six experts were interviewed, two from each institutional sphere of the cluster initiative. All respondents are aware of the IT cluster initiative, which is ensured by a respective question, and all are being involved in an emerging cluster in one way or another. Interviews included such questions as: What means to be a member of a cluster? What, in your opinion, should be the specialization of the IT cluster? What gains can stakeholders expect from participating in the IT cluster? And a number of other questions, fifteen in total.

Additional information was obtained during attendance of the special events dedicated to IT cluster initiative of the region.

4. Research Results

4.1. An Overview of the Regional IT Sector

Based on statistical data, Kaliningrad region hosts 159 specialized IT companies, and over 2.6 thousand IT specialists [18]. Most large IT companies were founded in the late 90s – early 2000s, being software developers and integrators (e.g. "System Technology", "1C-Bitrix", "NEOLANT-Tenax", "Virtoway", "KranX Productions"). An average number of employees in the Kaliningrad offices of these companies varies from 30 to 150 persons, while their operations are mostly export-oriented (i.e. extra-regional). Taking an overview of the distribution of

IT companies based on their core competences, we can summarize that just under 50% of all companies are engaged in the website/Internet business (Figure 1). These activities mainly focus on the domestic market and characterized by low yields. The IT sector of the Baltic region demonstrates a similar pattern, reflecting the growing interest in informatization, but also a lack of synergies, and a negative impact on the development of competitive competences of the regional IT market.

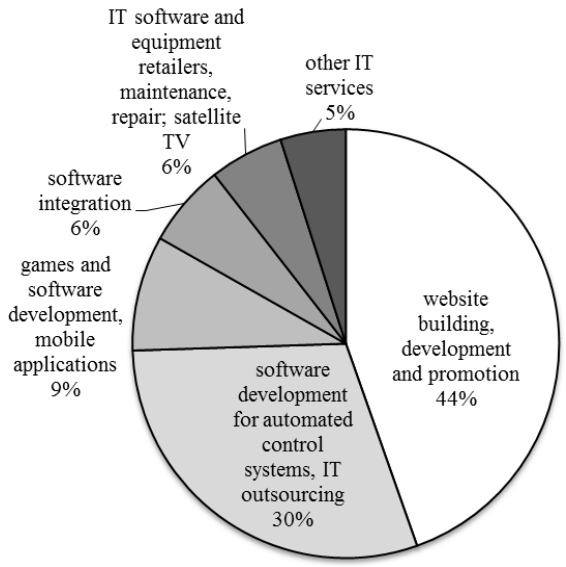

Figure 1. Distribution of regional IT companies based on their core competences, in percentage

Software developers play a key role in advancing the regional IT sector. The overall share of these companies accounts for more than 40%, including development and integration of software, automated control systems, outsourcing activities, and the Gamedev (i.e. game development) sector (incl. mobile applications). Most regional companies combine several activities, such as development and integration of software for businesses. Game development is one of the most promising areas of the IT sector. By 2014, there were 26 Gamedev companies located in the region, employing over 300 full-time professionals, such as programmers, 2D- and 3D-designers, flash animators, game designers, testers, project managers, etc. One of the leading companies in the field is "KranX Productions", founded in 2004 with approx. 30 full-time employees. The core of the regional gaming market are companies "HeroCraft", "Katauri", "Aigrind", "Intenium", "Dayterium", "Colibri Games", "Realore" and a number of others. Annual aggregate turnover of these companies is over 500 mln.rub. (based on the data from the "Development of creative industries in the Kaliningrad region" project).

Thus, the Kaliningrad region has an average level of development of the IT sector, while lacking powerful centers of industry growth expressed in world class TNCs (e.g. Microsoft, Google, etc.), large specialized R&D and education institutes. However, the region has formed a competitive 'layer' of companies in software and game development, capable of open market competition in the global market. Increase in the numbers IT companies, the intensification for inter-organizational, inter-sectoral and inter-regional cooperation can boost the competitiveness of the whole IT sector of the region, resulting in formation of a strong IT cluster.

4.2. IT cluster Initiative in Kaliningrad Region

The first steps in the formation of cooperative ties within the IT sector relate to the creation of the "Kaliningrad Information Technology Association" – Kalita back in November 2010. In the period from 2010 to 2012, the Kaliningrad region has displayed active steps to establish a number of professional IT associations and platforms for communication and exchange of knowledge:

- "ForkKonf" – a community of IT professionals, which aims to hold regular meetings and special events (e.g. conferences, seminars, forums, etc.) for knowledge exchange and cooperative ties between the representatives of business, science and public organizations. Regular events gather over 100 participants each month, while regional authorities are rather seldom visitors.
- Kaliningrad group of Linux users "Kalina LUG" and "Microsoft Certified Professional" club are associations of IT professionals in the field of programming.
- "Club of IT Directors of the Kaliningrad region", the aim of which is to create a more effective use of information technologies in regional enterprises (despite its name, holding the position of Director of an IT company is not a mandatory membership criteria).

Furthermore, there are a number of Internet-based IT communities: "Startup Kaliningrad" – a portal of start-up projects; "IT amber jobs" – a specialized portal for vacancies in Kaliningrad's IT sector; "Kgd-online.ru" – thematic regional association of IT professionals, etc.

The Information Office of the Nordic Council of Ministers in Kaliningrad made significant contribution to popularization of the cluster approach as a tool and a potential vector for IT sector development via the "Sustainable business cooperation in the Baltic Sea Region" project. Starting from November 2011, a series of training sessions for representatives of academia, business and government were held, being supervised by a leading Danish expert T. Winter. An initiative group in IT sector was formed. Information technology as a promising development sector was allocated based on the high level of interest in inter-firm cooperation expressed by the business and the presence of active individuals willing to volunteer the initiative. However, lack of funding did not allow establishing a centralized coordinating body of the initiative group (e.g. official cluster organization with permanent staff) and the related IT communities.

Meanwhile, the Government of the Kaliningrad region, the Kalita association and a number of major IT companies organizes the "Regional Innovation Forum" – a specialized platform to discuss the future of IT cluster. Actors of different institutional spheres (i.e. helices, as suggested by Henry Etzkowitz and Loet Leydesdorff) striving to consolidate their competences and capital took active participation. A series of events were held in the first two years of its existence, the biggest being held in November 2012 – "Forum: Kaliningrad IT cluster 2012".

Focusing on infrastructural and formal institutional support of the IT cluster initiative, regional government has organized a special "Kaliningrad Region Development Corporation". It is suggested that this corporation will

play a role of the committee to promote clusters, whose focal point is implementation of major infrastructural projects within the IT cluster. Its strategic activities include the establishment of an IT park "Kaliningrad", technology park "Amber" and the "I-City" project. Corporation has adopted a best-practice strategy, by replicating the experience of an IT industrial park build in 2009 in the Republic of Tatarstan, being the pioneer it Russia.

Some large IT companies located in the region are naturally willing to "pull the blanket" of state support towards the projects, they have nurtured. By March 2012, the "Association of producers and traders of electronic equipment Kaliningrad region "General Satellite Corporation" has elaborated a project proposal, reflecting their vision of the future IT cluster. The application was sent to the national cluster initiative program, however, it did not pass the competitive selection process due to insufficient S&T potential, low productive capacity and network development.

Figure 2 reflects on the development stages of the major actions taken within the IT cluster initiative in the Kaliningrad region. It clearly shows that the initial impetus for the formation of IT cluster in the Kaliningrad region came from business community. However, the distinguishing feature in comparison with other cluster initiatives of the Baltic Sea region is its bi-directional nature, i.e. a parallel existence of concerted actions on the formation of IT cluster formed "bottom-up" (sub-initiative of business and non-profit organizations) and "top-down" (sub-initiative of public authorities). The "bottom-up" sub-initiative can be further differentiated into two independent elements: "Kaliningrad IT Cluster" and "Cluster of Information and Telecommunication Technologies of the Kaliningrad Region" (further on: the "ICT cluster of the Kaliningrad region"), which compose different stakeholders.

Figure 2. Chronology of proactive actions taken aiming to form an IT cluster

A detailed study of the elements of cluster sub-initiatives shows lack of coordination between the sub-initiative groups, which is due to fundamental differences in their aspirations (i.e. strategic goals):

- Sub-initiative "Kaliningrad IT Cluster" is based on the interests of companies developing and implementing software products, including the development of mobile applications and games. The main purpose is to promote their own competitive products (i.e. software) to the global market. In this regard, a key challenge of the initiative is to consolidate the efforts for the development of the regional IT market and commercialization of software, while promoting an existing brand "KonigGames".

- Sub-initiative "ICT cluster of the Kaliningrad region", being initiated by the manufacturers ICT equipment (in particular located in Gusev municipality), reflects the interest in developing industrial production of high-tech equipment (e.g. microprocessors). Objectives are the creation of favorable conditions for the industrial production and its further physical export to the markets of Russia and CIS.

- Sub-initiative "Ingrad Baltica" initiated by the Government of Kaliningrad region (i.e. the Corporation) is aiming at attracting FDI and the overall development of the IT industry in the region. In the absence of clearly defined growth centers, authorities focus on the implementation of infrastructure projects, in particular, the construction of technology parks, which could act as a center for accumulating investments and start-up projects.

Thus, at this point the Kaliningrad region has three independent action groups in complementary areas: software, instrumentation and infrastructure. Such defragmentation of an IT cluster initiative is associated with an incomplete nature of the implementation of the 'triple helix' model, which was confirmed in the course of expert interviews with representatives of university, business and government.

In the course of interviews, it became clear that the authorities are not aware of the existence of sub-initiative "Kaliningrad IT Cluster", in turn, experts from academia and business have no information about the sub-initiative "ICT cluster of the Kaliningrad region". The question on the roles of actors of various institutional spheres played in the process of creating an IT cluster found no unity of views either.

Authorities tend to overestimate their functions, inflating their role and underestimating the importance of other actors. According to experts, state authorities should do the identification of the cluster, be the moderator of business and inter-organizational interactions (including initiation the establishment of the association to "unite fragmented IT community"), engage in marketing, be a test platform to promote the start-up projects, etc., while the role of academia is to implement an educational function.

Representatives of the academia suggest that the government has to provide favorable framework

conditions for business, regulating economic activity and implementing financial support for cluster members, attract large investments in the region. While business, as the main employer, should offer their platforms to solve practical issues, and the university – to carry out training and be the moderator of the cluster initiative.

Business representatives see universities as an institution for training and a discussion platform, capable of raising innovative micro-enterprises, which would commercialize scientific research in the areas of "big data" and "data mining". The main task of the authorities, in their opinion, is to simplify the procedure of opening a new business and easing the bureaucratic burden.

The consequence of inconsistency of the three subinitiatives is the lack of a single recognized specialization of the future IT cluster. From the perspective of experts from government, it seems that most reasonable focus would be the production of high-tech products (i.e. equipment), since the sector of computer games and mobile applications is "too narrow and not very prosperous undertaking". Business is more focused on software development, computer games and mobile applications. The prospects for growth in this segment, as well as current competitive advantages form the regional IT market. Representatives of the academia do not see the future of IT cluster, suggesting to place efforts (especially the financial) on traditional sectors of the regional economy, such as fisheries (incl. navigation and shipbuilding).

Schematically, the current institutional structure of the non-systemic interactions of actors involved in the IT cluster initiative is shown in Figure 3.

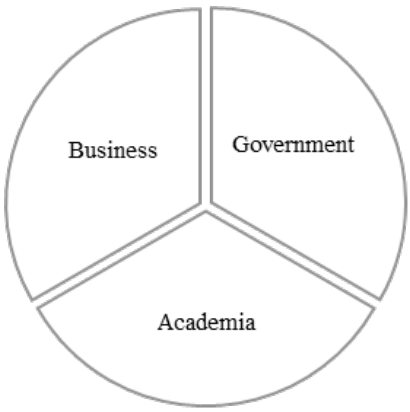

Figure 3. Detached institutional helices of the IT cluster initiative in the Kaliningrad region

Lack of coordinating bonds between institutional helices and, as a consequence, the inconsistency of their strategic priorities prevents the formation of the IT cluster. The solution to this problem would be to create a cluster organization, composed of representatives of all interested parties (academia, business, government and non-governmental organizations), which is consistent with the opinion of the experts surveyed, as none of the existing association or organization is able to perform this function. It should be noted that the composition and functions of a cluster organization raises some questions. The main concern of business is bureaucratization of the cluster organization; turning it into a regulatory and supervisory authority. In their view, such an organization should consist of representatives of public organizations that have no direct commercial interest, but with sufficient set of tools for building an effective system capable of attracting external funding.

One of the fundamental reasons for the lack of formed relationships between actors is conceptually different interpretation of the essence of the cluster approach. Interviewed experts agree that the economic cluster is a value chain, which increases the competitiveness of the product and may consist of units having different territorial localization. For the majority of respondents, with the exception of the authorities, membership in the cluster is the actual direct or indirect participation in this value chain. Experts from the regional authorities further emphasize the need for the localization of enterprises in a certain area – the industrial park. Using this interpretation of the cluster, the university and authorities see themselves outside the cluster, initiating only auxiliary processes. While business representatives see their involvement in the cluster as a natural process that does not require any formal binding.

According to the experts, the unsystematic nature of the cluster initiative is the result of inconsistency of interests promoted by particular initiative groups, being composed of a narrow range of actors. Moreover, the authorities do not have information about the activities carried out by the IT community, which in turn is not informed about the plans of the Government and the "Kaliningrad Region Development Corporation" in particular. Moreover, according to the representatives of business, the main activity of the authorities relate at promoting the start-ups, largely neglecting the needs of the current companies.

5. Summary and Concluding Remarks

Research results on the IT cluster initiative in the Kaliningrad region are the clear example showing that cluster can hardly be defined by a single industry or an extremely broad sector of specialization, such as IT. Regional IT cluster initiative has gradually but logically split into a number of separate sub-initiatives, representing the crossroads of competences and aspirations of actors. We can thus suggest that Kaliningrad IT cluster initiative is a broad formalized term describing a heterogeneous set of constantly evolving constellations of ties, driven by commonalities and complementarities. Individual elements – composition of the regional IT cluster initiative, can be illustrated as a gearwheel of the regional IT market (see Figure 4).

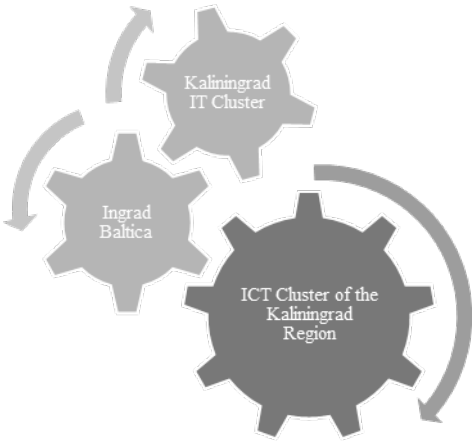

Figure 4. Individual elements of the regional IT cluster

Taking on the overview of the cluster elements that are striving for unity (i.e. individual gears) we can allocated four thematic categories.

First category: a cluster in the field of software development, with the products and services being directed at a wide range of economic agents (e.g. raw, industrial and commercial enterprises) to automate their activities. This category is consistent with the strategic guidelines of the "Kaliningrad IT Cluster" sub-initiative, and unites the companies engaged in the development and integration of software in the industry organizations, regardless of their sectoral focus. The software can be developed in the framework of the outsourcing activities via industry specific project. The Kaliningrad region has a number of large competitive companies (e.g. 1C-Bitrix, System Technologies, NEOLANT-Tenax, IBS, etc.) with a distribution network covering the domestic market, the CIS and Eastern Europe.

Second category: a cluster in the field of game development, mobile applications and Internet technologies (i.e. virtual IT products). This category is also consistent with the strategic guidelines of the "Kaliningrad IT Cluster" sub-initiative. Linkages within this category involve a large number of highly specialized SMEs being geographically dispersed. Based on the level of localization of large Gamedev companies, Kaliningrad occupies a leading position among Russian cities. Relatively strong competitive position the companies from the Kaliningrad region have at the international arena, especially within the Baltic region. The prerequisites for the development of this specialization are internationally competitive companies, strong ties with freelancers worldwide, initial orientation on the global market, and the presence of a recognizable brand "KonigGames".

Third category: a cluster in the area of offshore programming (i.e. outsourcing of IT development), being actively promoted within the "Ingrad Baltica" sub-initiative (i.e. the top-down initiative of the state). Despite this specialization being seemingly attractive to the regional economy (due to its export orientation), local business acknowledges that Russia has a fairly modest rate in the offshore market, being far behind the leaders – India, Ireland and China, while local IT companies are users of offshore services themselves.

Fourth category: a cluster specialized in the production of high-tech equipment being consistent with the strategic guidelines of the "ICT cluster of the Kaliningrad region" sub-initiative, equally supported by the state. It is based on existing competencies of large industrial enterprises occupied in the production of high-tech products. Antecedents to its formation are the customs and tax preferences, provided due to the Special Economic Zone regime. However, a strong dependence on customs and tax legislation, as well as on logistical networks might have negative consequences for the regional sustainability in the end.

A study on the defragmented structure of the regional IT cluster initiative has shown possible directions for its development. The seemingly different cluster categories have uncountable intersections in terms of competences, knowledge and resources required for prosperous future. Government authorities, being detached from commercial operations, should focus at strengthening the competitive advantages of existing large companies, while creating an enabling environment for the emergence of a large numbers of smaller firms and freelancers who specialize in specific tasks (i.e. providing micro-specialization).

Note

Note 1: Based on "The concept of long-term socio-economic development of the Russian Federation" and on "The strategy of innovative development of the Russian Federation for the period up to 2020".

Note 2: The main measures of state support for the formation and development of clusters are inter-budget subsidies, tax incentives, special programs that involve the development of state institutions and companies with state involvement.

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