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## CLUSTERING AS MODERN CONCEPT OF REGIONAL DEVELOPMENT (EXPERIENCE OF JAPAN)<sup>3</sup>

### Abstract

*In the modern conditions clustering concept became one of the most popular modern trends, especially in the Asia-Pacific region. Japan has one of the most successful experience of cluster policy. It has a great variety of different forms of clusters in its regions: technology parks, industrial parks, science parks and others. Nowadays, Japanese government provided a number of Business Startup Support Programs for supporting innovation sectors in Japanese regions. This measure became one of the most successful in regional development. Japan is actively implementing a number of programs for development of scientific and technological cooperation with private enterprise and science centers. Nowadays, clustering also became one of the main sphere of New Economic Growth Strategy of Japan.*

**Key words:** regional development, clustering, clusters, innovation policy, industrial park, Japan

**JEL classification:** O3, O2, F5

## ФОРМИРАЊЕ КЛАСТЕРА КАО САВРЕМЕНОГ КОНЦЕПТА РЕГИОНАЛНОГ РАЗВОЈА (ИСКУСТВО ЈАПАНА)

### Апстракт

*У савременим условима концепт кластера је постао један од најпопуларнијих трендова, посебно у азијско-пацифичком региону. Јапан по искуству има једну од најуспешнијих политика кластера. Она је заснована на великом*

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<sup>3</sup> The results of this research were achieved within the frameworks of the governmental assignment of Russian Ministry of Education and Science in the sphere of scientific research during the researching assignment # 26.1478.2014/К “The structural transformation of Russian Economy through the integration installation in the industrial markets of Asia-Pacific Region”

*избору различитих облика кластера у свим подручјима: технолошки паркови, индустријски паркови, научни паркови итд. Сада, је Јапанска влада обезбедила низ почетних пословних програма за пружање подршке иновационом сектору у јапанским регијама. Ова мера је постала једна од најуспешнијих у регионалном развоју. Јапан активно спроводи низ програма за развој научне и технолошке сарадње са приватним предузећима и научним центрима. Данас, су кластери постали један од главних области нове стратегије економског раста Јапана.*

**Кључне речи:** регионални развој, груписање, кластери, иновациона политика, индустријски парк, Јапан.

## Introduction

Nowadays, the economic activity of the most part of industrialized countries has the growing impact of globalization and internationalization - processes which are fundamental basement in the formation and development of the world economy. The liberalization of international economic relations and the development of information and communication technologies (ICTs) are the main engines of the global economy and economic integration of the countries. Besides, one of the most important concept of regional economic development is clustering.

Cluster is the economic agglomeration of related companies, and it is a point of growth and an important factor for sustainable socio-economic development of the region. Thus, cluster policy, firstly, creates the conditions for innovation activity in the economy and its modernization for the formation of the technological leaders. Secondly, clustering provides the possibility to solve actual social problems of the regions in the conditions of the shortage of natural resources.

According to the current global economic trends of social development the strategic perspective of the sustainability and competitiveness of the territory became the social development. Thus, the role of socially-oriented clustering became important in the regional development strategy. The aim of this strategy is to solve problems of increasing quality of life.

Clustering is not a new concept. It has a long period of historical development. The theoretical basis of this concept, which gives opportunity to explain the patterns of the world policy of economic clustering, is the theory of “industrial districts” of G. Becattini (Becattini, 1992).

The research of clusters is closely connected with the research field - the location theory. The direct impact on the development of the theory of clusters had: the theory of regional development (J. Thunen, V. Launhardt, A. Weber, A. Losch), the theory of regional specialization (A. Smith, D. Ricardo, E. Heckscher, B. Ohlin, P. Samuelson), the doctrine of autarchy (F. List), the concept of polycentric process (geopolitical regions) and the geo-strategic balance of forces (S. Cohen), the theory of zoning (W. Isard) etc.

A lot of researchers have attempted to structure the basic theoretical assumptions of the theory of the clustering creation, but based on the terminological and substantial views the phenomena of cluster is incompletely investigated.

According to the transition of competition in the innovation sphere the innovation activities of the company became one of the most important factor for future financing. The competitive position of modern companies is completely dependent on how effectively they organize the innovation activities, including research and development (R&D), knowledge management, as well as a system for collecting and processing information which necessary for innovation process. Thus, the development of the most effective system of innovation activities is a priority form for the private sector and public authorities in the country. This problem is actual for Japan, which faced with strong competition from fast-growing Asian neighbor-countries.

## **Modern concepts and forms of regional development**

It can be identified that one of the most common type of innovation infrastructure is an incubator. Large-scale programs to create incubators began in the middle of XX century in the developed countries, in the 1980-1990th in the developing countries.

Based on the definition of the European Business Innovation Centre Network, a business incubator is a specialized tool in the policy of regional economic development and regeneration policy by providing the multi-disciplinary professional support to small innovative business in an international context (IASP, 2012).

The fundamental difference of an incubator from other objects of innovation infrastructure is that it aims to support small companies with high growth potential that are at the beginning stage of the development.

The increasing risk of an incubator functioning is that in common business practice only one of ten innovative projects is successful, but, on the other hand, it is impossible to identify the successful project on the first stage of development, because it is determined during the incubation process (OECD-WB, 2011).

One of the largest facilities to support the innovation process is a technology park, which is considered in the world as the most effective form of integration for education, science and production spheres. In addition, it is common to use some other terms such as “scientific park”, “research park”, “industrial park”. Originally, all these objects of innovation infrastructure had its own specifics, but nowadays the borders between all these concepts were destroyed.

The first scientific parks appeared in the USA and in Europe in the 1960th, and in Asia - in the 1970th. According to research, nowadays, there are more than 1.5 thousand of scientific parks in the world (Albahari, 2010).

Nowadays, the scientific parks are more common in Europe (in the UK of more than 100) and Asia (Japan, Korea, Taiwan, Singapore).

A lot of researchers consider that on the basis of industrial park it was begun the process of development of clustering. For example, recently in China there are some major projects for construction of the industrial parks as the clustering type.

The different types of scientific parks can be identified based on the level of the research and production activities (Figure 1).

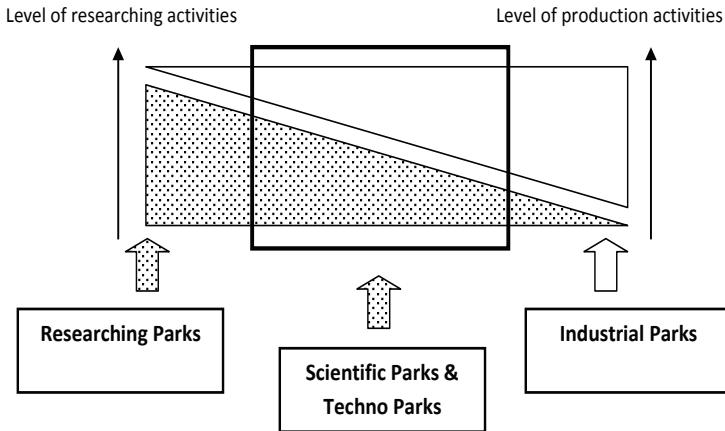


Figure 1: Characteristics of scientific, researching and industrial parks

Source: (Saitakis, 2011; Akira Goto, 2009; Toffler, 1990)

The scientific park has different main features - it is not only commercialized the research results, but it also manages and develops innovation products and services. Nowadays, the successful scientific parks increased and they turned into the scientific cities (“science cities”), and on their territory it is concentrated the several research clusters, universities, government agencies to support innovation (France, Sweden, Spain).

Occasionally, there is a concept of “technological zone” in the world practice (in the USA), the territory where it can be located several industrial parks, and these zones provide the same benefits and services that are normally available to residents of technology parks.

Clustering can be identified as a key instrument for increasing the competitiveness of industries and regions, improving the innovative capacity and economic development in the medium and long-term perspective in the countries of the European Union.

According to the world practice, in recent decades the process of cluster formation is quite active. However, each country has its own specific national features relating to public policy in the area of support and development of clusters. Clusters have been actively created in the late 1990th in Germany and Finland, and then in other European and Asian countries.

The researchers identified mainly three stages in the development of scientific concepts of clustering. The first stage of the beginning of clustering is the craftsmanship (the beginning of the XVIII century). This stage is characterized by the formation of a theoretical core of the clustering of economy, which makes it possible to explain the relationship between the co-location of firms and their economic efficiency (theory of “industrial districts” A. Marshall and G. Bekattini). The second stage (the beginning of the XX century) - the development of the theory of territorial distribution of enterprises and economic zoning (A. Weber, U. Izard and others), and the researches of the causes of formation of inter-industry complexes generated by the entering to innovation economy (R. Kouz, J. Schumpeter, F. Perry). The third stage (the last quarter of the XX century

- the modern period) - the formation of cluster theory (M. Porter) and the development of the basic theoretical concepts that support the cluster theory. It was determined that the cluster theory is developed within the framework of economic geography, regional economic theory, the theory of technological development, institutional theory.

In 2000, in Europe it was created the international project about clustering (European Research Area), the main idea was that the single European cluster can be insufficient to rely on its own forces of agglomeration to attract resources. The creators of this project based on the fact that lack of resources can be compensated by the establishment of close international relations.

The experts from different countries highlight the fact that it is focusing on the territory of a cluster of small, medium and large businesses can achieve the synergies in innovation development.

Clusters were widespread in a great number of countries and in some countries they have become an integral part of the national innovation strategy. In France, in 2005 it was created a special program of the clustering “The competitiveness clusters policy”, which has the purpose to integrate the companies with training centers, public and private research institutions for implementing the innovation projects (European Commission, 2011).

The analysis of development of different theories identified the importance of government agencies and research institutions in the formation of the clustering and it was formed the main directions of clustering in the economic development worldwide (Table 1).

*Table 1: Characteristics of clustering in the economic development*

<b>Industries</b>	<b>Countries</b>
Electronic and communication technologies	Japan, Switzerland, Finland, USA
Construction and development	Finland, Belgium, Netherlands, Denmark, Germany, China
Agro-industry and food manufacture	Finland, Belgium, France, Italy, Netherlands, Germany, Bulgaria, Hungary
Oil & gas industries and chemical industries	Switzerland, Germany, Belgium, USA
Timber industry and paper industry	Finland, Norway
Textile Industry	Switzerland, Austria, Italy, Sweden, Finland, China
Healthcare	Sweden, Denmark, Switzerland, Netherlands, Israel
Transport	Netherlands, Norway, Ireland, Belgium, Finland, Germany, Japan
Power Industry	Norway, Finland, Sweden
Machine engineering	Italy, Germany, Norway, Ireland, Switzerland
Pharmaceutical industries	Denmark, India, Sweden, France, Italy, Germany
Bio-technologies and bio-resource industries	Netherlands, Austria, Great Britain, Norway

(Source: OECD-WB, 2011; European Commission, 2011)

The experts from different countries agree that there is no one unique model for creating innovation infrastructure, especially for clustering. Based on the scientific researches, it can be identified the following models: North-American model (the minimum level of government guidance and a high level of interaction between the scientific and industrial activity, Silicon Valley); French-Japanese model (creating a huge

industrial park, which is concentrated in the territory of several other objects of innovation infrastructure); Scandinavian model (creation of small parks and implementation of national development programs); South-European model (modernization and creation of new jobs, which involves the active participation of inter-governmental European funds for developing the infrastructure).

Industrial park is a unique territorial area of high technology. The core of its formation basically was universities, which should be identified as infrastructure component of the industrial park. There is typically some industrial, research and development corporation around such basement component. It forms a common industrial and social infrastructure.

Based on the world experience of industrial parks it can be identified some specific features and factors of its effective functioning.

1. It has sufficient scientific, technical and educational potential (for example, in “Silicon Valley” there are 17 universities, 23 qualified educational institutions, about 6000 PhD professors).
2. The basis of industrial parks is specialized enterprises, including plants, equipment maintenance facilities before and after production; it forms a comprehensive system of research and production. For example, in “Silicon Valley” there is a supporting industrial system in addition to a variety of electronic enterprises.
3. There is a high level of concentration of leading enterprises and large capital equipment in the industrial park. It is especially actual for “science city” (Technopolis), which has a great necessity of investment spending over a long period of time.
4. One of the most important factors for success is the location of the industrial park. As a rule, it is situated in the suburbs of large cities, which are near the equipped and accessible information channels and advanced communications network. It should be considered the location of the transport network for effective logistic operations. There is also one factor for attraction of foreign scientific researchers in the region, it is a favorable environment and good conditions for living and education.
5. The industrial parks should have a flexible policy of providing benefits which promote the renewal of production and creation of new businesses. It is usually encourage to support the development of small businesses, provide incentives for risk capital investments, as well as for investments in venture businesses.

According to the IASP (International Association of Science Parks) and Institution for the Future there is a global change in the trend of technological development. There is a change not only in the formats of industrial and technology parks, but also some changes in its role in the development of society and economy (Table 2). The competitiveness and profitability of industrial parks of old generation is rapidly decreased.

*Table 2: The main periods of world development of industrial parks*

Characteristics of the period	The first period (1947-1970)	The second period (1971-1985)	The third period (1986-2013)
The widespread type of the industrial park	University parks, regional industrial parks, scientific cities	Technological incubators, specializing industrial parks, centers of technologies transformation	Networking industrial parks, community of industrial parks
The main process	Research and development programs (R&D programs)	Commercialization of research and development (R&D)	Creation of the space of information exchange, creation of joint projects
The basement	Laboratories in the universities, complex researching bureaus of transnational companies	Complex of technological business incubators	Internet community, networking complex of industrial parks
The owners of industrial park	Universities, transnational companies	Governments, regional and administration authorities	Innovation brokers and agents, venture companies, investment funds
The product	Innovation products	Technological decisions and technologies	Researching potential
The service	Access to the source of knowledge and the source of practical experience	Competitive rental conditions (realtor business), expansion of accompanying services	Access to the professional community
The leading countries	USA, Great Britain	Europe, Asia	USA, Asia

(Source: Albahari, 2013; International Association of Science Parks and Areas of Innovation, 2012; The Global Competitiveness Report, 2015; Competitive Industrial Performance Report, 2013; World Investment Report, 2014)

There is a change of formats of industrial parks every 15-20 years, that due to the changing market trends, the economy and the transformation of the whole society.

The number of industrial parks in the world is rapidly grows. Nowadays, there are more than 700, and 43% of them are in the USA, 34% - in the EU and 11% - in China and 13% - in other countries. Silicon Valley is a the most successful standard of venture capital business area. Firstly, it means the most successful technological base - a set of the most advanced knowledge-based industries, based on a highly developed industrial infrastructure, the most modern forms of communication between science and production. As a result of the evolution of industrial parks and technological parks and clusters it was developed the basic models - American, European and Japanese.

## **Japanese Clustering in regional development**

Japan is an example of how the deficiency of natural recourses may eventually lead to a competitive advantage, because this deficit has forced the country to develop an innovation model with the basis of the energy-saving technologies.

In Japan, the formation of industrial clusters began in the late 1970th. But the active phase of cluster creation started since 2001. Until last decade, clustering was carried out only with the support of the central government, but nowadays it moved to the regional authorities. Since 2001, it was carried two projects of development of industrial and

intellectual clusters, which were developed based on international experience, especially the experience of the USA, but they have distinctive features.

As in the USA, the clusters in Japan are created for promoting the most advanced scientific and technical researchers. In Japan, these areas are nanotechnology; robotics; the “mixed sector”: biological production, ecological, and bio-informatics.

In the USA, the main influence in the creation of clusters has the leading companies, research centers and universities, which initiate and organize the whole process, but in Japan, a crucial role has local governments (prefectural and municipal authorities) and companies.

The weak point of Japanese innovation system is a disconnection between the participants of the innovation process - private companies, scientific research, education, government agencies, thus, the first key objective is the establishment of co-operation between these actors.

Another key objective of the development is recognized the venture capital business, which has the most active support from the government.

There is one of successful example demonstrating the features of Japanese policy for development of clustering - “Sapporo Valley”, it is one of Japanese first large research and production association, which was created in Hokkaido, in 1976.

In 2001, Sapporo administration established the Sapporo City Center of digital R&D, designed to facilitate software developers, web designers and other professionals in creation of venture projects. At the same time it developed a program “e-Silk Road Program”, which aim is the development of cooperation with foreign partners.

There are also some foreign Asian partners in this project - Seoul (South Korea), Daejeon (North Korea), Shanghai, Shenyang, Shenzhen, Hong Kong (China), Hsinchu (Taiwan), Bangalore (India), Singapore. As a result, “Sapporo Valley” became a cluster with a steadily growing gross income that can enter the number of the largest software development centers in Asia.

The City Council and Chamber of Commerce Sapporo prepared a joint proposal to attract some companies from South Korean and Britain which produced software, and they came with this proposal to the Ministry of Economy, Trade and Industry (METI), and the proposal was selected in 2004. Bureau of Economy, Trade and Industry of Hokkaido began in 2004 the realization of the second project of super-cluster in Hokkaido. It was the comprehensive support for communication and cooperation with the countries of North-East Asia, and the program “e-Silk Road Program”, according to this Sapporo is connected with other centers of information technology of Asia. It is developed and implemented programs to attract foreign firms to the Valley of Sapporo.

Nowadays, Japan has a program «Knowledge cluster initiative», stimulating the development of clusters in the 18 regions of the country in which regional universities are the basement of clusters formed by a network of small innovation firms and large industrial companies.

The process of clustering, which is typical for industrialized countries, begins to emerge with the active participation of the government and in developing countries, such as India, which is actively involved in global competition, mainly with the development in the sphere of offshore programming. The center of scientific and technical progress in India is Bangalore, which is developing as a center of intensive technologies, and its enterprises are actively working with local research centers and institutes.



The main factors for the transformation of Bangalore center in the center of intensive technologies are the following: active participation of the government and large enterprises in the public sector for more than 30 years; the allocation of central government public investment enterprises and institutions; cancellation of burdensome state licensing regime; creation of scientific training centers; orders of American firms provide the flow of foreign investments; determining at the legislative level of national priorities and the priorities of the export product.

There are also great Japanese experience of the development of industrial parks abroad under bilateral cooperation: Neemran Industrial Park (India). This industrial park, specially prepared for the Japanese producers. Investor, developer and operator is Rajasthan State Industrial Development & Investment Corporation RIICO. The total area of project is 472 hectares. The number of residents is 30 Japanese companies.

In 2001, the Ministry of Economy, Trade and Industry (METI) elaborated Plan for creation of industrial clusters. According to this plan it is necessary to promote the close cooperation of small and medium-sized businesses with research institutions in order to achieve a high level of technological development and creation of new business. With the support of the regional departments of METI and private organizations it was created 19 projects in all regions of Japan.

Plan for creation of industrial clusters has 3 stages of its implementation: the first stage (2001-2005) the initial period, the period of formation of industrial clusters; the second stage (2006-2010) a period of growth of industrial cluster; the third stage (2011-2020) a period of self-sustaining development of the industrial cluster.

According to this plan the production structure of a particular region should develop in such direction in which the product of the cluster becomes necessary for other industries of the region. Thus, there are strong relations among all the sectors in the region, which can provide future stability of the economic developments of the country.

The phenomenon of clustering is unique, it is economic agglomeration of related enterprises on the territory which has a long history of development from the period of handicraft production.

Industrial cluster is a community of economically closely related industrial companies mutually contribute to the overall development and growth of competitiveness. Mostly, it is an informal association of large leading companies with a lot of small and medium enterprises, the creators of technology, communication market institutions and consumers which are in the same value chain.

Based on New Economic Growth Strategy, which aimed at achieving sustainable economic development in the long-term period, it have been developed in 2006 some government programs - New National Energy Strategy and Global Economic Strategy by Ministry of Economy, Trade and Industry of Japan (METI). It was the basis of the current economic and industrial policy of the government and at the same time it became part of a comprehensive national long-term reform program. New strategy of economic growth determines the direction of Japanese development for the future, the main objectives and priorities of economic development.

Nowadays, innovation became the “national idea” in Japan, the terms like “innovation activity”, “innovation development”, “innovation cycle” are used in every modern government programs.

It was identified that Japanese were the first researchers who investigated the model of innovation process, which include integration of research and development (R&D) with production and manufacturing, and the close cooperation of consumers with providers. Firstly, this model used by Nissan company and it enables to develop products that exactly correspond to the necessity of the market, and simultaneously it helps to reduce the costs.

In 1990th it was developed the new model of innovation process. Its principal difference is that the innovative enterprise should not only integrate all stages of the innovation process, but also to cooperate with other sources of knowledge - universities, research centers and enterprises. This scheme provides the access to the necessary knowledge, which greatly increases its potential for innovation, and as a result, the level of international competitiveness. It was especially actual for Japan, because it faced with strong competition from some industrialized Asian countries from 1990th. The most famous Japanese specialists in this area are researchers from School of International Corporate Strategy, Hitotsubashi University, Ikujiro Nonaka and Hirotaka Takeuchi (Nonaka, I. & Takeuchi, H., 1995).

In our research we had the analysis of financial stimulation support of innovation activities of the private sector from Japanese government. There are so specific features of the Japanese concept of financial stimulation of innovation activities. Firstly, it should be mentioned such instrument as the tax benefits. The experience of Japan proved the idea that for private sector it is more efficient to provide tax benefits than direct grants and subsidies from the government. It is actual because of the fact that the company receives the relevant benefits only after the making some requirements of a particular government program, while the subsidies are a kind of so called “advance” and unknown outcome. Secondly, the tax benefits do not require additional costs for the establishment and functioning of the administrative mechanism of the allocated funds.

The main objective of tax benefits to enterprises is to stimulate the growth of R&D, which are the main indicator of innovation activity in the private sector. In addition, the government can set a tax credit to other expense items related to the innovation activity of the enterprise to meet the requirements of the state innovation program. Thus, nowadays there are tax credits for Small and Medium Enterprises (SME), conducting R&D, and enterprises engaged in innovation activities in collaboration with the research, educational institutions and government agencies, as well as companies conducting research in the fields of science.

Nowadays, Japan is actively implementing a number of programs for the development of scientific and technological cooperation with private enterprise and science. And there is a difference of the scheme of realization of such cooperation in Japan from European countries. Thus, in the developed countries of Europe, the scientific and technical cooperation between business and science is generally taken place on the basis of creation of venture companies by the researchers from universities and research organizations. In Japan, due to the factor of national mentality unwillingness of risk such scheme is not widespread. In this regard, there are special intermediary organizations - the so-called “organizations of licensing technology” (OLT), it is a kind of a link between companies and research and educational institutions.

These organizations support researchers in patenting technologies and products, which they developed and then transfer the technology to private companies, in other

words these organizations are negotiators between scientists and entrepreneurs. The new industries in Japan were created mainly with the help of OLT. The part of the revenues from these businesses is for the scientists, who conduct appropriate investigations in this sphere, and it helps to enable future research activities in the universities. The advantage of this system is that scientists can completely devote to their research without being distracted by patenting their inventions, searching of client-companies and other activities. The entrepreneurs have also their benefits by saving time and finance in searching process of scientific and technological inventions.

The characteristic feature of a new model of innovation process in the companies is the implementation of innovations in the inter-organizational level. The most effective way, which successfully organize the innovation process by involving other companies as well as various kinds of research and educational institutions, is the researching activities in the cluster.

The companies operating in the clusters have several advantages of other companies. Firstly, they have more qualified access to information of the markets, progress in technology, inventions of new concepts in service and marketing. Secondly, active cooperation with local research institutions greatly facilitates access to the latest scientific and technological achievements. Thirdly, close contact with the local educational institutions provides a unique opportunity to recruit and train new highly qualified staff. According to these advantages of the clusters, the clustering became one of the most popular governmental policy as the set of measures for supporting the existing and new clusters.

The implementation of the program of cluster development in Japan began later than in other countries, and it has its own specific features of clustering. This is due to the fact that, firstly, one of the main direction of the governmental policy was regional development, while creating a system of interaction between the private sector, science and government was not completely developed. Secondly, there is a number of institutional barriers such as the lack of legal framework basis. The active process of cluster policy in Japan began in 2001 on the basis of Plan for development of science and technology.

Cluster policy in Japan has the following objectives: development of cooperation between business and science; active support of the development of business venture; development of priority industries of science and manufacturing; strength of international contacts, attraction highly qualified foreign personnel to Japanese companies; attraction to cooperation of local administration authorities.

In 2013 Japan accepted Strategy of the development of Science, Technology and Innovation, it is a long-term perspective for ideal economic society. It was elaborated a number of support programs for development of innovation by Japanese government. Japan is known as a country which widely support venture companies. There are some Venture Support Programs in Japan, which bring necessary support for the future development of new business. The overview of specific governmental support programs is presented below (Table 3).

Table 3: Support Programs for Business Startup in Japan

I. Subsidy Programs	II. Preferential Investment and Tax Treatment	III. Loan Programs	IV. Management Consulting
1. <i>Start-up Grants</i> (this program subsidizes part of funds needed by young entrepreneurs to start local businesses based on existing family businesses)	1. <i>Business Startup Support Fund</i> (Under this program, private venture capital funds and other funds in which SME Support Japan invests provide support to venture businesses which are 5 years old or younger.)	1. <i>Funds to Enhance SME Business Capabilities Enhancement Support</i> (this program provides low-interest loans to SME companies receiving support from certified support organizations)	1. <i>Professional Support for New Business Creation Program</i> (under this program, professionals, including top venture capitalists, lawyers and accountant provide support to venture businesses with strong growth potential)
2. <i>Subsidy Program to Revitalize Small Business</i> (this program supports development of new products and services and expansion of sales channels by small businesses)	2. <i>Business Startup Support Tax Incentives (Angel Tax Incentives)</i> (this program provides preferential tax treatment to investors investing in young companies)	2. <i>New Business Startup Loan Program</i> (this program provides unsecured, non-guaranteed loans of up to 15 million yen to persons planning to start a business which are second-phase old )	2. <i>Business Creation Support</i> (under this program, a portal site for matching of SME and people receiving support will be established)
	3. <i>Investment by innovation Network Corporation of Japan</i> (Under this program, Innovation Network Corporation of Japan invests in venture businesses and projects to commercialize cutting-edge technologies)	3. <i>Guarantee related to Business Startup</i> (this program guarantees loans up to 25 million yen borrowed by persons planning to start a business and companies which are 5 years old from private financial institutions)	3. <i>Certifies Support Organizations</i> (certified support organizations provide consulting service as easily accessible consultation windows based on The SME Business Capabilities Enhancement Support Act)
		4. <i>Quasi-capital Funds</i> (this program provides long-term, lump-sum redemption funds necessary for operating new businesses)	

(Source: METI Journal Venture Businesses, 2012; Japanese Science and Technology Indicators, 2013; OECD, 2014; Kim Young Gak, Ito Keiko, 2013)

Nowadays, Japanese regions promote the formation of “industrial clusters” and “intellectual clusters”. Its aim is to create new industries by cooperation of industries and universities. It is a long-term perspective, and it takes long period of commercialization.

However, industrial cluster cannot be completely formed only by affiliation between industries and universities. M. Porter examined the sources of such competitiveness after analyzing cases of industrial integration that have resulted in high international competitiveness (Porter, 1990). He concluded that such sources should be found where companies, suppliers, connected organisations are geographically concentrated (Figure 2).

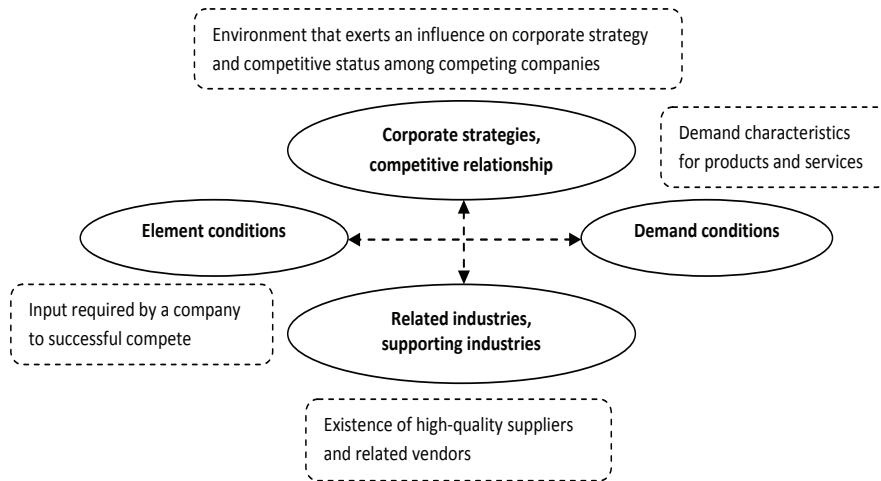


Figure 2: Diamond Framework for formation of Industrial Cluster  
(Source: Porter, 1990)

The example of highly successful cluster in Japan is the combined automobile and machine industries in three prefectures (Aichi, Mie and Gifu) located in Tokai region of Japan. Tokai region of Japan is a basis for well-known in worldwide automobile plants (Toyota Motor Corporation, Aichi prefecture; Honda Motor Co., Ltd., Mie prefecture). The development of automobile industry in this region provides the positive environment and stability in the regional economy of Japan (Table 4).

Table 4: Japanese government activities for creation of New Industries

Organization	Industrial Policies	Activities
Chubu Prefecture Bureau of Economy, Trade and Industry	Industrial cluster plan	1. establishing human networks among universities and companies 2. providing support for the development of new businesses, the creation of venture start-ups
Ministry of Education, Culture, Sports, Science and Technology	Intellectual clusters	Providing support for the creation of businesses from university-originated technological seeds
Aichi prefecture	New industry creation plans	1. creating new industries (ventures) 2. establishing appealing business environments 3. supporting the development of existing industries (global networks) 4. setting up a systems and structures to promote industrial vitalization
Nagoya prefecture	Nagoya Science Park	Soliciting company participation
Mie prefecture	Forming industrial clusters	1. Crystal Valley (liquid crystals) 2. Medical Valley (drugs) 3. Silicon Valley (semiconductors) 4. Pearl Valley (call centers)
Gifu prefecture	“Sweet Valley”	Forming a large cluster for IT-related companies, contents business and robotics industry

(Source: Iwaware Yoshihiko, 2004; Japanese Science and Technology Indicators, 2013; Saitakis, 2011; OECD, 2014)

This region became one of the most industrialized prefecture in Japan as a result of the governmental support in the process of modern industrial policy. Tokai region has also the highest level of innovation development in Japan. The innovations of this region include not only technical improvements, but also process innovations and new business models of management.

## Conclusion

Clustering is a logical step in the development of modern economy. Japan has the most developed structure of clusters, and it also has some specific forms of cluster.

Industrial clusters in Japan mostly deal with innovation activities, such as research and development and new business in new spheres of industries. There are some plans for creating the industrial clusters until 2020.

Nowadays, Japan has specific concept of regional policy. Japanese experience shows that the government support of regions remains the required form of regional policy in the market economy. Japan found mechanisms of direct and indirect methods' combination to develop and support the regions, and in future attract the private sector for participation in different government programs.

Clustering was developed in Japan in the framework of regional and industrial policy of the country by the Ministry of Economy, Trade and Industry (METI). Historically, Japanese economic system is based on planning, which is one of the most important element of the economic policy in Japan.

With the beginning of the crisis period in the global economy, Japanese government actively involved in the economic development to implement anti-crisis programs and Business Startup Support Programs for businesses. It began to change the priorities of the government policy. It was identified some specific areas of government support in Japan - social sphere, regional policy and support for small and medium enterprises (SME), especially venture businesses. Regional policy based on clustering was selected as one of the priority element of support by the government in the crisis years, this support is provided with the help of additional budget program.

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