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Fukuoka Next-generation Social System Creation Hub as a Regional Innovation Platform Strategy

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Abstract

The purpose of this article is to introduce and describe the case of Fukuoka Next-generation Social System Creation Hub based on the conceptual framework of regional innovation platform strategy. In short, it is a "government-issued" regional innovation platform strategy to improve innovativeness with limited creative capital through "borrowing" not money but network, wisdom, know-how, and ideas from each other between some stakeholder groups in a region. The Fukuoka Industry, Science & Technology Foundation, which is the coordinating institution of the whole program, plays the role of a platformer to unify various projects into the program crossing borders between stakeholder groups for building regional innovation platforms that lends intensive support to feedback loops between the program facilitator and its partners in the program. Thanks to being a government-issued one, it could be tied together with some wide ranging issues of policy on social innovations, such as the "low carbon society" or the "health and longevity society." But at the same time, it is a concern that many regional research institutions that have innovative potential and diverse ideas become governed by the platform without their noticing it and dealt with in the same way based on "selected" and "designated" strategic goals. Therefore, it seems that a regional innovation platform strategy is a kind of "double-edged sword" in public policy in the era of "panopticism of bureaucratic society" in Japan.

Keywords

Regional innovation; Platform strategy; Social system; Fukuoka

1. INTRODUCTION

Since 2006, I have introduced several cases of cluster and innovation policy in the northern Kyushu area, centered on Kitakyushu and Fukuoka, through the UNESCO-WTA International Training Workshop (Cha, 2006; 2008; 2011; 2012). It is my consistent intention to describe how regional policy and


planning for innovation changes the structure and scene of a traditional industrial region into that of an industrial cluster. What is the best conception of it?

Since 2010, when some cluster programs closed the curtains as a result of the Japanese government's budget screening process, the Kitakyushu and Fukuoka area has changed based on a new framework of national policy for regional innovation called the Regional Innovation Strategy Support Program.

In this article, I would like to introduce and describe this program based on the conceptual framework of regional innovation platforms. We begin with a conceptual review of this type of program, which is expected to become more and more common in upcoming years..

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2. WHAT IS A REGIONAL INNOVATION PLATFORM STRATEGY?

A platform strategy, originally, is a business strategy to build an ecosystem of new business through making external network effects by putting many groups of stakeholders into a platform (Hirano and Hagi, 2010). This concept was proposed by Kenichi Ohmae in 2001 for the first time (Ohmae, 2001). If we adopt a platform strategy for regional innovation, it must be a cross-organizational strategy for a whole program to form an alliance with some regional stakeholder groups such as businesses, academia, and administrations.

It can be also said that a regional innovation platform strategy is a quite new form of leverage to improve innovativity with limited creative capital through “borrowing” from each other in a region. That is to say, it becomes possible to ignite innovation through borrowing not money but the network, wisdom, know-how, and ideas from other regional stakeholder groups, although the innovative power in one’s own possession is small.

When conceiving of a regional innovation platform strategy, it is indispensable to make an organization into a “platformer” who unifies various projects into a program crossing borders between stakeholder groups and a system that lends intensive support to feed-back loops between the program facilitator and its partners in a program. In such a case, it has been called a multi-sided platform (Hirano and Hagi, 2010, p.33).

A regional innovation platform as a multi-sided platform has the following characteristics:

- It interconnects more than two stakeholder groups.
- A group needs other groups.
- It creates some value that cannot be gained from each group separately.
- It assumes an important role as a system to create new value from external network effects by interactions between stakeholder groups.

Then, there are five functions expected from a regional innovation platform as follows:

A. Matching

A regional innovation platform provides a system and infrastructure for promoting stakeholder groups who attract each other to interconnect and interact.

B. Triangular prism

This is a function to couple stakeholder groups who usually have no direct interaction. This can be compared to the ef-

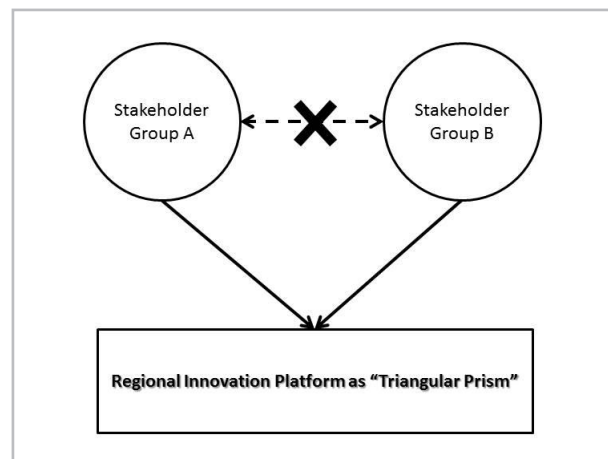


Fig. 1. Triangular Prism Function of Regional Innovation Platform

Source: based on Hirano and Hagi (2010), p.45

fect of a triangular prism that changes the direction of reflected light (Fig. 1).

C. External network effect by community formation

It is a function to contribute to strengthening the adhesion of a regional innovation platform through building up reliable information in each stakeholder group and causing inter-circulation of information among them through the viral effect.

D. Cost reduction

A regional innovation platform provides for the efficient processing of “troublesome tasks” that require more time and cost if each group cope with them separately.

E. Branding

A regional innovation platform provides a kind of confidence and guarantees the quality of innovation to some extent.

3. FEATURES OF FUKUOKA NEXT-GENERATION SOCIAL SYSTEM CREATION HUB

3.1 Background

In Fukuoka prefecture, in addition to advanced semiconductors, formation of development bases in various potential fields, such as biotechnology, hydrogen energy, automobiles, nanotechnology, robotics, information content, the environment and low carbon technology has been promoted. In the advanced semiconductor field, Fukuoka prefecture has advanced activities with its four pillars of “support of research

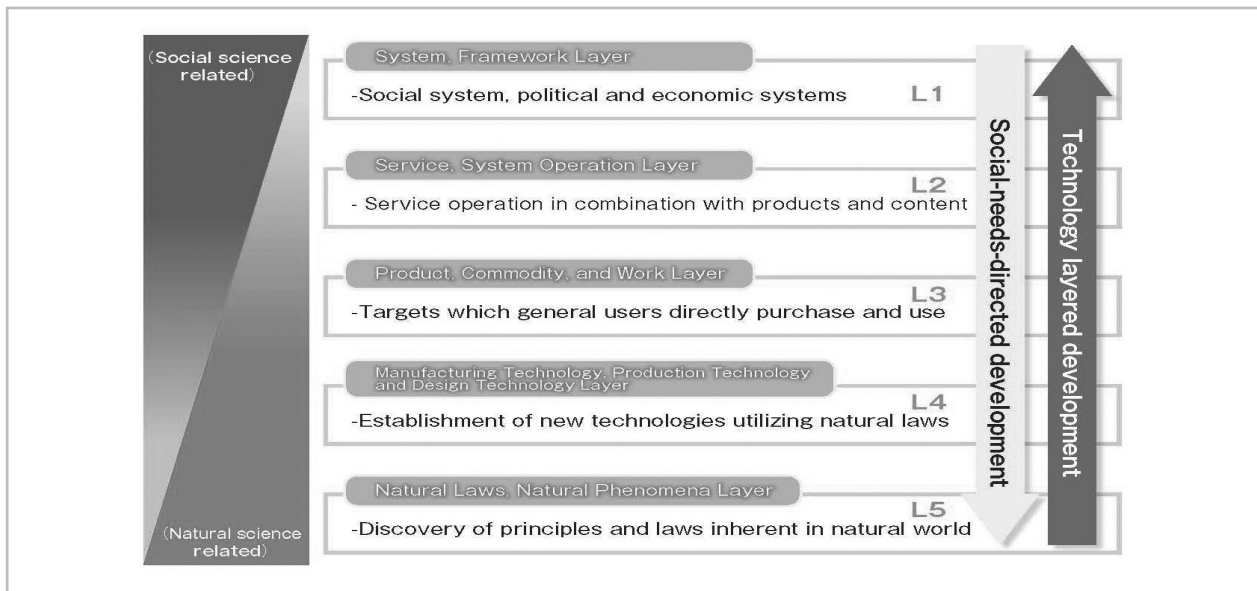


Fig. 2. Social-needs-directed Development Model

Source: adapted from Fukuoka Innovation Promotion Council (2014), p.6

and development,” “development of human resources,” “development of venture capital” and “promotion of exchange and cooperation” through promotion of the Silicon Sea Belt (SSB). The Fukuoka concept¹ and 258 companies related to advanced semiconductors have held meetings, mainly in the Fukuoka and Kitakyushu areas, since March 2013. These meetings have occurred more than ten times over the last ten years (Fukuoka Innovation Promotion Council, 2014).

Commercialization of development results, development of human resources and fulfillment of a development environment have advanced since 2001, and infrastructure needed for growth as an international innovation base is also being established. However, in order to survive and succeed in international

competition and realize regional sustainable development for sustaining continuous growth under the ongoing globalization of the economy, it is necessary to establish a new system of regional innovation. In response, regional industries, academia and government entities related to the financial industry have formulated a regional innovation strategy called the Fukuoka Next-Generation Social System Creation Hub.

The strategy and its achievements up until now have received positive evaluations, and this area was designated as a Regional Innovation Strategy Promotion Area² by the national government in August 2011. Activities based on the regional innovation strategy support program³ and supported by MEXT were launched in July 2012.

¹ This concept is to establish a world level advanced semiconductor development base as the core of the Silicon Sea Belt that connects Eastern Asia (Fukuoka, Kyushu, South Korea, Shanghai, Taiwan, Hong Kong, and Singapore etc.) taking full advantage of the potential in Fukuoka, where intelligent resources in universities, semiconductor related companies and automobiles are concentrated., The project was launched in 2001 (Fukuoka Institute of System LSI Design Industry, 2015).

² Since Fiscal 2011, the Ministry of Education, Culture, Sports, Science and Technology (MEXT), the Ministry of Economy, Trade and Industry (METI) and the Ministry of Agriculture, Forestry and Fisheries (MAFF) have jointly selected regions with excellent original vision toward the creation of regional innovation and designated them as regional innovation strategy promoting regions (MEXT, 2012).

³ The Regional Innovation Strategy Support Program provides support for proactive and self-sustainable local activities, such as those for the formation of intellectual property, the development of human resources (intangible “soft human” aspect), in regions where MEXT’s assistance is expected to contribute largely to the realization of their regional innovation strategies. Regions eligible for receiving support are selected from among the regional innovation strategy promoting regions. Programs consist of 4 parts: such as 1) concentration of researchers in charge of regional framing, 2) development and implementation toward regional human resources development program, 3) Establishment of intelligence network by regional cooperation coordinator, and 4) Sharing of research facilities and equipment in regional research institutions. Each selected region shall combine these programs to promote projects for the creation of regional innovations (MEXT, 2012).

3.2 Aims and Points

This strategy aims to increase the added value to development achievements through research in combination primarily with the advanced semiconductor field and with different fields of clusters, and also to create technologies and products necessary for the establishment of a new social system. This system will solve challenges, such as the “low carbon society” and “health and longevity society,” that the world confronts today, through the establishment and practice of a social-needs-directed development model. It will guide the formation of a world-class innovation base that will assume a leadership role in Asia from this prefecture through international standardization of development achievements (see Fig. 2).

Traditional research and development among industry, academia and government have been conducted based on research seeds (ideas for research or retained technologies) of researchers in research institutions such as universities. Although various products and new technologies have been released as a result of research and development, the fact remains that a great amount of research and development has been cast aside without application or utilization in our life and society.

A series of research and development processes tend to be set up only from a researcher's point of view, and even when research is completed and researchers are satisfied with the product or technology, it may be completely different from the needs of society without knowledge and may become completely unmarketable.

Thus, in future research and development, an approach is necessary to gain detailed insight into social systems which will be required in the future, discover corresponding technical challenges to be solved, and determine research content. In order to advance research and development, it is also important to evaluate and analyze development results through verification tests in society, finding necessary improvements, repeating the research so as to prevent products or technology from diverging from the needs of society. This will lead to their being accepted by society and is the reason why the social-needs-directed development model was established and practiced in this strategy.

Mr. Eisaku Ohtsuru, the project director, said that this strategy includes the following two points (Fukuoka Innovation Promotion Council, 2014, p.3):

A. Promotion of additional high value through a combination of different fields

In the Fukuoka and Kitakyushu areas, in addition to ad-

vanced semiconductors, formation of a development base in various potential fields has been promoted. It is critical to add high value to development results by promoting combined research between advanced semiconductor industries and different fields.

B. Promotion of practical diffusion by social-needs-directed development

It is also important to evolve from traditional research-seeds-directed development among industry, academia, and government to social-needs-directed development. In other words, it is indispensable to give back research results to society through evaluation and implementation of development content by societal verification, gaining an insight into a vision of society which will be required in the future, extracting new development challenges from there, and developing systems which can solve challenges through the collective efforts of industry, academia and government.

3.3 System

Fig. 3 gives a general view of the whole system of the Fukuoka Next-generation Social System Creation Hub as a regional innovation platform strategy. There are four main activities to lend intensive support in the system based on the framework of the Regional Innovation Strategy Support Program:

1) Concentration of researchers who serve a key role in regional framing

There are 11 themes that are under development by research representatives and invited excellent researchers in charge of next generation regional innovation from both inside and outside Japan. They are from regional research institutions of national, municipal, and private universities and public institutes such as Kyushu University, Kyushu Institute of Technology, The University of Kitakyushu, Fukuoka University, Waseda University and the Institute of Systems, Information Technologies and Nanotechnologies. These institutions and their researchers receive support through this program. Through combined research with different fields and applications of a “social needs-led development model,” integration of developed elemental technologies is achieved, and these integrated technologies are applied to the society system establishment technology development (system application development).

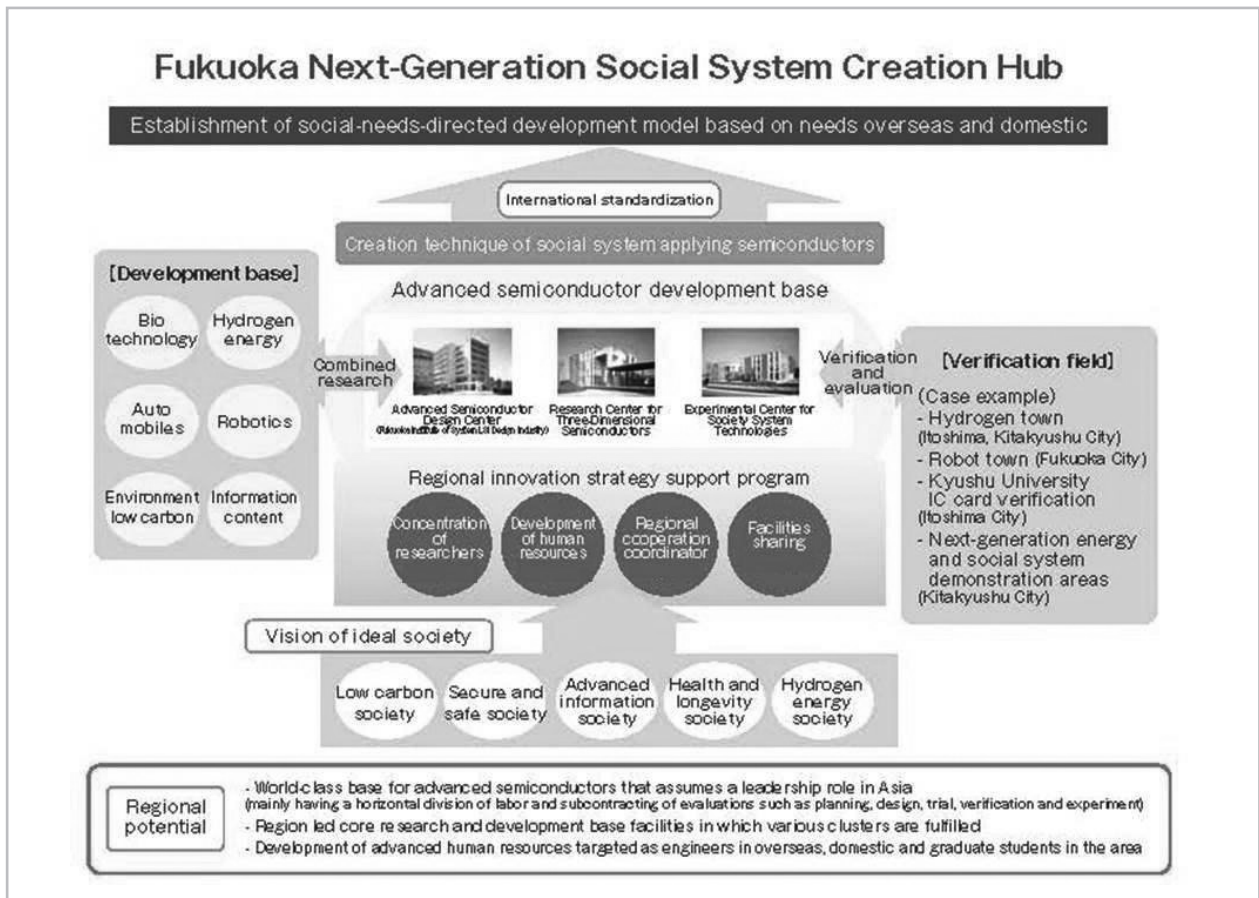


Fig. 3. Whole System of Fukuoka Next-generation Social System Creation Hub

Source: adapted from Fukuoka Innovation Promotion Council (2014), p.4

	System LSI design engineer training program Digital Analog	Built-in software engineer training program	SMD engineer training program
Application program (Classroom lecture/practical study)	Architecture Integrated circuits	In-vehicle networks Automobiles/electric vehicles Communications networks Image processing	Implemented with support of this program EMI/ noise Reliability technologies Thermal design Joint technologies
Basic program (Classroom lecture/practical study)	Survey of System LSI technology Logic circuit design Circuit description language (Verilog/HDL)	C language Built-in microcomputers Software engineering	Survey of SMD technology SMD method Three-dimensional packaging

Fig. 4. Program of Fukuoka System LSI College

Source: adapted from Fukuoka Innovation Promotion Council (2014), p.11

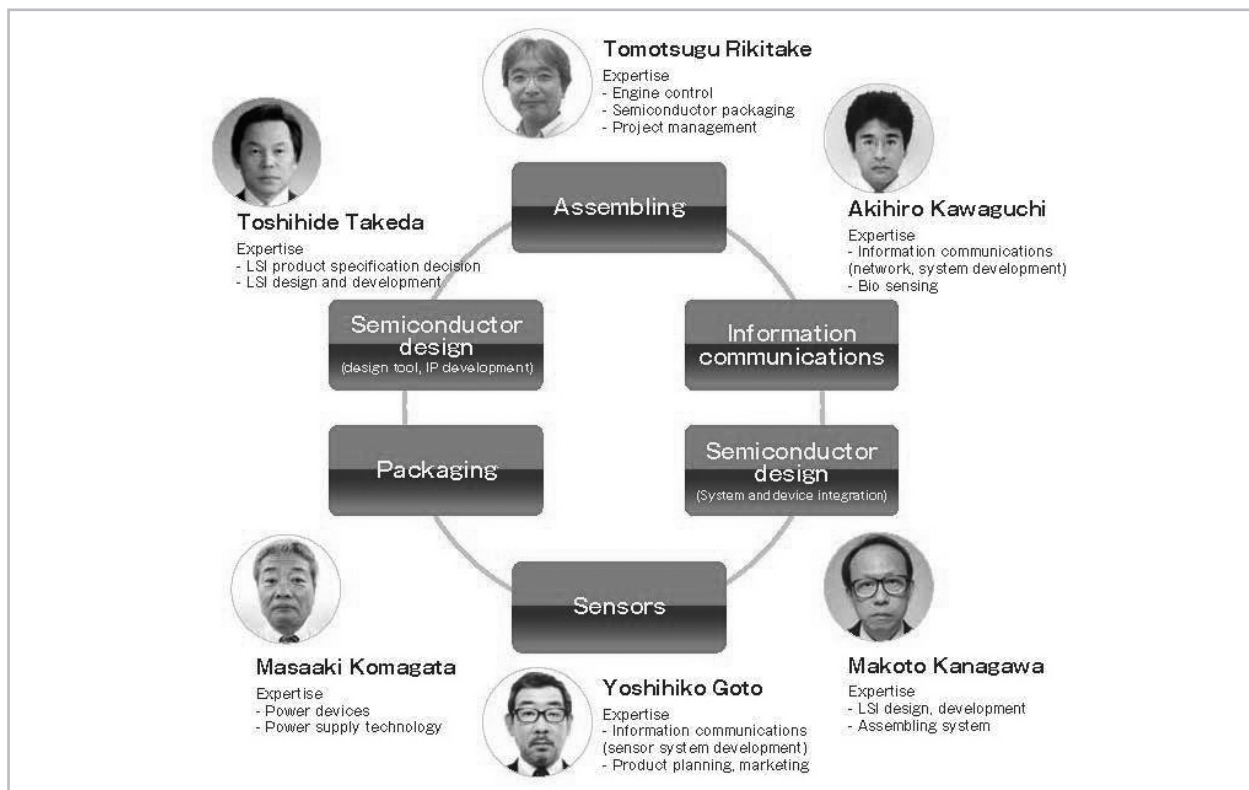


Fig. 5. Intelligent Network by Regional Cooperation Coordinator

Source: adapted from Fukuoka Innovation Promotion Council (2014), p.12

2) Development and implementation of a regional human resource development program aiming to cultivate industry-ready engineers

Fukuoka Industry, Science & Technology Foundation, the program facilitator, has been operating Fukuoka System LSI College since 2001 with support from Fukuoka Prefecture, Kitakyushu City and Fukuoka City for the purpose of educating employees and reeducation for engineers in society.

The college opened an SMD engineer training course (basic program) in 2011 in addition to a system LSI design engineer training program and established a built-in software engineer training program, which has acquired a good reputation from trainees with a systematic curriculum based on companies' needs, high-quality instructors and unique textbooks. It is training more than 1000 engineers yearly. Especially important is the fact that this program develops and opens up an application course for the SMD engineer training course. This program has been developing industry-ready SMD engineers who can perform optimizing integration design for entire systems in each

process from development and research of products to manufacturing, which contributes to the enhancement of semiconductor manufacturing in regional companies (see Fig. 4).

3) Establishment of an intelligent network by regional cooperation coordinator

There are six regional cooperation coordinators who direct efforts to combine and cooperate amongst different fields with vision and insight for next generation social systems. Not only do they match seeds and needs by collecting, sorting and sharing information from research institutions such as universities and companies, but they also offer close support at each step from startup of research themes to commercialization. Additionally, they conduct promotional activities leading to achievements in research and development, regional employment effectiveness, economic effectiveness and attraction of companies. No consultation fee is required. Of course, it is no wonder that they are under conditions of strict confidentiality (Fig. 5).



Fig. 6. Sharing research facilities and equipment

Source: adapted from Fukuoka Innovation Promotion Council (2014), p.13

4) Sharing of research facilities and equipment in regional research institutions

Higher performance and miniaturization of electronic products have occurred as integrated circuits have been highly densified with the evolution of refinement process technology for semiconductors. However, refinement technology is approaching its limits, and further refinement will lead to increased risks and costs for large scale facility investment.

Therefore, Fukuoka prefecture opened the Research Center for Three-Dimensional Semiconductors with the Organization for Promotion of Academic City by Kyushu University (Itoshima Research Park) as a technology center capable of

density growth by lamination (three-dimension technology) of semiconductor chips (without depending on refinement) that will become a key to semiconductor industries in the future.

The center has acquired equipment which can process substrate fine pattern formation, substrate film formation, Si fine pattern formation and Si film formation for three-dimension technology. This can be shared with research institutions, such as universities and semiconductor-related companies. The program allocates technical staff familiar with operation of equipment in the center and provides technical support to users (Fig. 6).

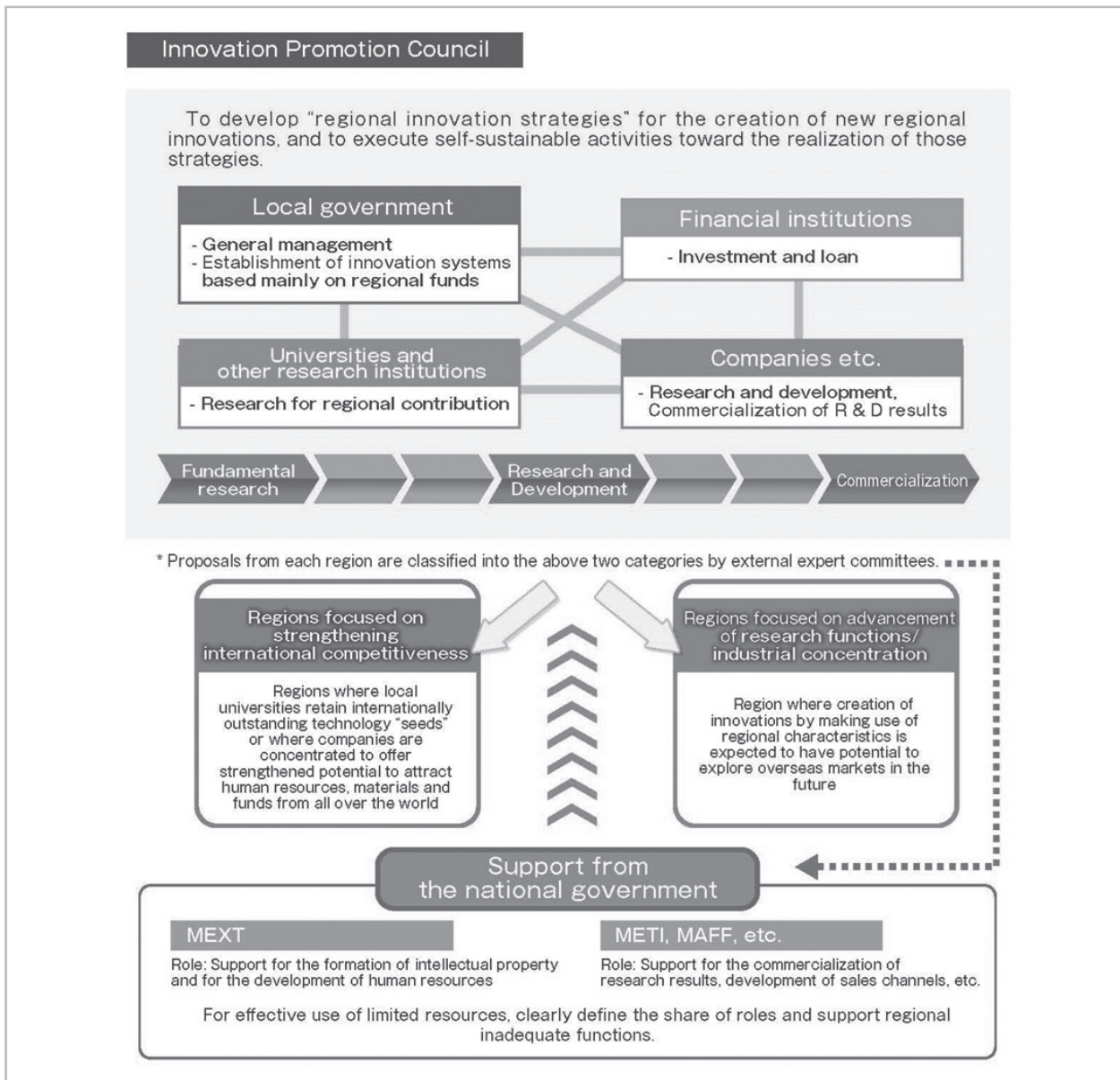


Fig. 7. Fukuoka Innovation Promotion Council

Source: adapted from Fukuoka Innovation Promotion Council (2014), p.7

3.4 Organization

The Fukuoka Innovation Promotion Council and the Fukuoka Industry, Science & Technology Foundation are the two main institutions in the program and are accompanied by various other research institutions serving smaller roles.

The Fukuoka Innovation Promotion Council was established to have a long-term perspective and promote the creation of

new regional innovations. This council is composed of 28 members from local governments, business groups, universities, research organizations and financial institutions and is responsible for establishing regional innovation strategies. Importantly, as a council selected by the government, it receives seamless support for all activities, ranging from fundamental research conducted by universities to commercialization of research results

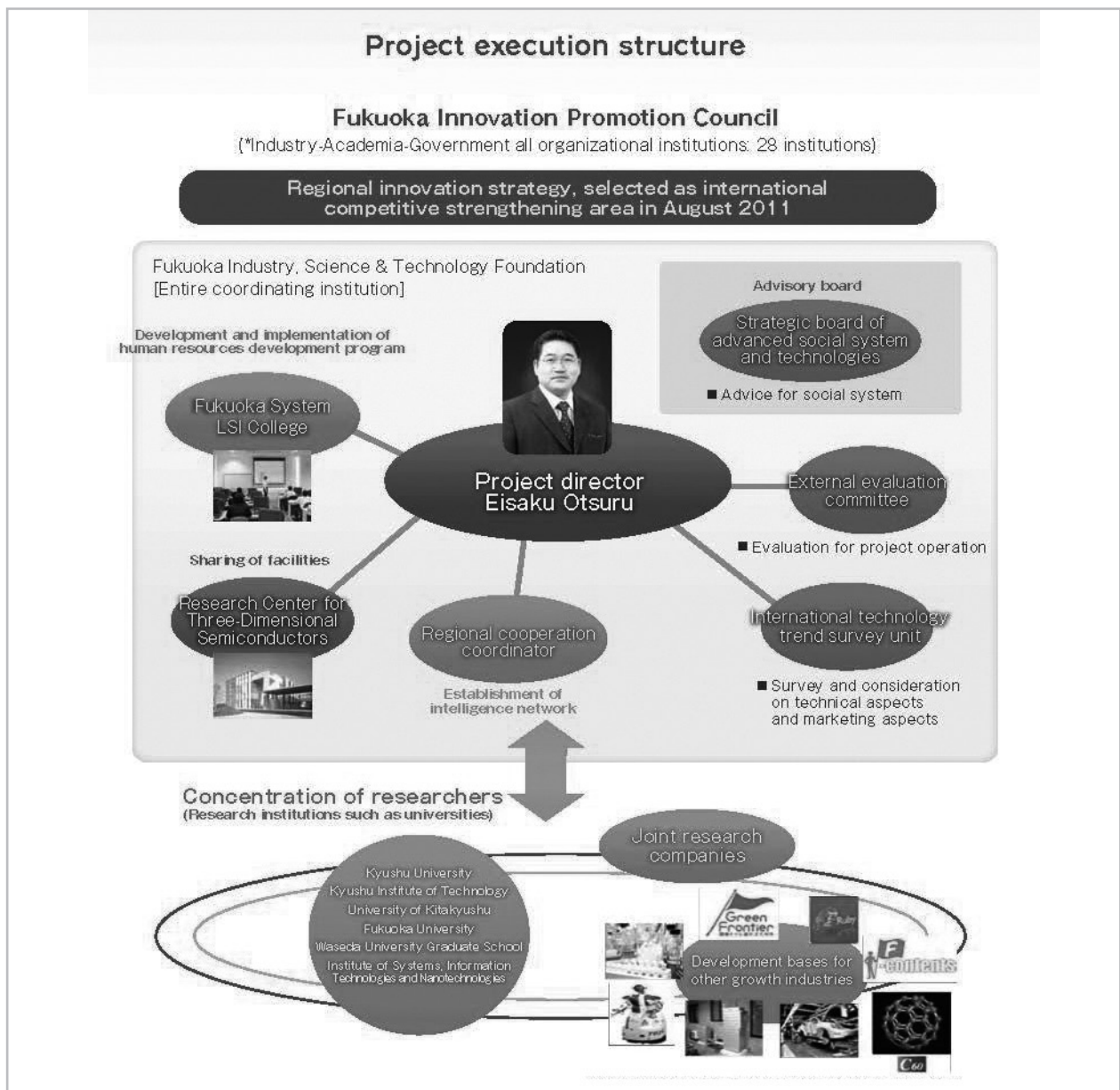


Fig. 8 Fukuoka Innovation Promotion Council

Source: adapted from Fukuoka Innovation Promotion Council (2014), p.14

by companies. This means that all pertinent policies of relevant ministries can be utilized to provide full-fledged support to realize its regional innovation strategies comprehensively and efficiently. The council establishes the system that allows industry, academia, government and the financial sector to collaborate and create sustainable and expansive innovations by maximizing

regional characteristics (Fig. 7).

On the other hand, the Fukuoka Industry, Science & Technology Foundation, which is the coordinating institution of the whole program, plays the role of a platformer for building regional innovation platforms between the council and stakeholder groups in the region (Fig. 8).

4. SUGGESTION

It can be said that the Fukuoka Next-generation Social System Creation Hub is a “government-issued” regional innovation platform strategy. Thanks to being a government-issued one, it is possible that this program is tied together with some wide ranging issues of policy on social innovations, such as the “low carbon society” or the “health and longevity society.” But at the same time, it is a concern that many regional research institutions that have innovative potential and diverse ideas become governed by the platform without their noticing it and dealt with in the same way based on “selected” and “designated” strategic goals. However, the platform can provide comprehensive support for related policies thanks to being a government-issued one. Particularly, in a “winner” regional innovation platform strategy such as the Fukuoka Next-generation Social System Creation Hub, which is watched with keen interest by the government, it can seem tyrannical to some stakeholder groups that have interests which are divergent from the dominant ideas of the strategy. Therefore, it seems that a regional innovation platform strategy is a kind of “double-edged sword” in public policy in the era of “panopticism (Foucault, 1975) of bureaucratic society” in Japan.

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