Global Open Innovation and Policy Challenges

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ABSTRACT

Global open innovation is not new to many small economies. Innovative firms are open to capabilities available beyond organizational and national boundaries. Cross-border collaboration is flourishing. Regions with strong cluster portfolios become innovation hubs, while regions with no clusters risk stagnation. Universities are critical in helping regions tap into global resources. Open innovation is stimulated across a number of sectors. It calls for flexible approaches to public governance. Several areas of innovation policy making deserve attention: creating regional platforms for competitive clusters, using universities as global knowledge and resource pipelines, adopting flexible intellectual property strategies to capture benefits from knowledge exchange, improving research program designs and funding mechanisms to facilitate knowledge sharing, and using intermediary organizations as interfaces for exchange.
Keywords: *global open innovation, knowledge network, innovation governance*

INTRODUCTION

Open innovation is about open business models for innovation. The key notion is to create value through innovation and to capture a portion of that value by all means (Chesbrough, 2003, 2004). In the past, in-house research and innovation was the norm for large firms. Firms used their internal pool of talented employees, had them work in special conditions that were free from market pressures, and relied on them to bring about innovation. Intellectual properties were carefully protected to create enough incentive for inventors and to eliminate opportunities for competitors. Research and development (R&D) advances were incorporated internally into the firm's products and services. Revenues generated were partially used to finance the next cycle of in-house R&D.

Due to the rising costs of R&D staffing and infrastructure, and fast shifts in technology development and product markets, in-house R&D can no longer cover all competencies that are needed by large firms. To reduce the cost of R&D and increase the return on it, firms have found ways to complement their in-house R&D with external technologies, drawing from everywhere in the world. They offer their own technologies to competitors that have better access to markets through corporate channels (Gassmann, 2006).

As a result, R&D at large firms is shifting from its traditional inward focus to more outward-looking management. The approach to R&D is no more *we do it our way*, as the old business model suggests. On the contrary, the approach of open innovation is *access the best—anywhere*. Certainly the basic assumption of this sourcing is that multiple sources (universities, start-ups, suppliers, and competitors) of ideas and diverse sets of innovators (including private and public sectors and users) are available and well distributed. Sustained competitive advantages are rooted in the ability to link to ideas and knowledge, wherever they may be located, and use these linkages to learn and accumulate specialized competencies (Lundvall, 2006). In this global open innovation model, external sources of knowledge and external paths to markets are given a weight similar to a firm's own expertise and traditional proprietary marketing channels.

However, firms cannot research all possible choices and anticipate all possible outcomes in their external search, sourcing, and licensing; rather, they choose from a number of known options defined within the constraints of knowledge suppliers and transition cost (search strategy and information costs) (Kirschbaum, 2005; Laursen & Salter, 2006). There are constant changes in supply and demand, as well as great varieties in the framework conditions that create uncertainty and risk in firms' business models and innovation practices. This raises fundamental questions concerning new opportunities for innovation policies and the way they should be addressed.

The concept of global open innovation is not new for many small economies. Small economies cannot be self-sufficient in ideas and develop products for internal markets only. It is always an issue for an individual firm or institution to obtain the size or critical mass to compete internationally. Many small economies are very aware that they need to be open to resources and capabilities that are available beyond their national boundaries (Asheim & Gertler, 2005). Lack of R&D capacity and a paucity of domestic markets have taught firms to connect to and leverage external sources (Grant, 1996). It also makes sense for firms to license innovations to foreign partners that have the resources needed to launch new products to global markets.

However, the idea of global open innovation still poses particular challenges to most national innovation policies in small economies, since they have been designed through a top-down process based on the concept of a national system of innovation (OECD, 2002; Groenewegen & Steen, 2006). Will global open innovation become a threat to national innovation systems? Will firms lose core competencies as the result of extensive use of external knowledge sourcing and external paths to commercialization? Will countries lose their knowledge base and spill-over following an increased

emphasis on knowledge sourcing and development abroad? How can innovation policies, which are still predominantly designed at the national level, be structured to react to new opportunities and challenges? Although many small countries have adopted flexible strategies toward policy making across the whole of the government, a change in thinking is needed for their implementation.

MAJOR FOCUS OF INNOVATION POLICY

Today, useful knowledge and resources tend to be dispersed across different regions and actor groups. Competence means capability to tap into, absorb from, and serve as a gravitation point within multiple knowledge sources (Cooke, 2005; Hughes, 2007). Several areas are becoming the focal points of policy agenda for many governments and are worthy of further attention. These areas are discussed below.

Create more regional platforms for competitive clusters to emerge

Clusters are interconnected territorial hubs, with high concentrations of specialized companies and institutions linked with each other. The emergence of the meta-cluster suggests that global open innovation has increased the need to combine strong internal dynamics within clusters with solid linkages to clusters located elsewhere. Small economies, in particular, need stronger transnational cooperation between clusters with complementary strengths. As clusters become key factors in attracting international capital, people, and knowledge, regions with strong cluster portfolios will have more opportunities to become innovation hubs, while regions with no clusters or isolated research risk falling behind.

Several European countries and regions launched a wide range of cluster initiatives long ago (e.g., Catalonia and the Basque Country in Spain, Veneto in Italy, Scotland in the UK, Sophia Antipolis in France, Denmark, and the Netherlands), while others have started them within the last few years (e.g., a number of Austrian regions, the Czech Republic, the UK, Sweden) or further developed them through national initiatives (e.g., France and Germany). But they have often been focused only on strengthening individual clusters. Today both national and regional policy makers need to look outside their own territory and take global open innovation into account in their policies. Gaining access to the global markets, integrating global supply chains and global knowledge, and making the regional cluster visible and attractive to international investors are critical for innovative clusters to go global.

Global open innovation has strengthened the role of clusters and furthered their development. The more markets globalize, the more resources flow to attractive regions (Doloreux & Parto, 2005; Asheim & Coenen 2006). Many regions have discovered that being a host to useful resources such as specialized companies, research institutes, and innovative support organizations is not enough; a climate with networking, exchange, and trust between the various actors is necessary. Regions become more visible and attractive if local clusters have strong linkages to related clusters in other regions and countries. If regions want to develop competitive clusters, regional platforms must be built up in cooperation with higher education institutions, public authorities, and the business sector.

In Europe, the Competitiveness Innovation Programme, the Cohesion Policy, the INTERREG initiative, and the 7th Framework Programme include a wide range of activities open to clusters, innovation, and competitiveness. The purpose is to help regions build unique profiles of specialized capabilities that enable them to strengthen their role as active and attractive partners in global open innovation. Regional platforms have been set up in a number of countries with the intention of promoting dialogue and the exchange of knowledge among businesses, research institutes, and government agencies. It is assumed that the broader the range of actors and actor groups with which firms interface, the higher the probability that ideas and knowledge complementary to the firms' own activity and capabilities will be identified.

Identifying which knowledge-based resources and capabilities are valuable, unique, and inimitable and how those resources and capabilities support a firm's products and market positions are essential elements of a knowledge strategy. The ScanBalt Competence Region was initiated to create transparency and identity within the life sciences and biotechnology sector in the ScanBalt BioRegion.[1] With the growing number of activities, it will be more and more crucial for the actors to know who they and their partners are and what they are able to do in a collaborative manner to meet the challenges and opportunities of one single meta-region. The ScanBalt Competence Region is co-financed by EU FP6 and aims at mapping competencies and resources throughout the ScanBalt BioRegion. The resulting competence map will then serve as a basis for discussions of future strategy.

Innovation policies and funding programs are usually developed as top-down initiatives established by central governments, with limited involvement of regional stakeholders in the decision-making process. Yet, regions can differ substantially with respect to their industrial specialization, their connectedness to national and global arenas, and, in

[1] The ScanBalt BioRegion is a meta-network consisting of regional clusters and bio-valleys in biotechnology and the life sciences. The meta-network encompasses 11 countries, including Denmark, Estonia, Finland, Iceland, Latvia, Lithuania, Norway, Poland, Sweden, North Germany, and Northwestern Russia.

particular, their potential to face national and global competition. Therefore, policy measures are best tailored to the region at hand. It is critical to involve the key regional actors as necessary ingredients for success (Cappellin, 2007).

Transform higher education institutions into global knowledge and resource pipelines

Universities already have multi-faceted functions, including educating people (training skilled undergraduates, graduates, and postgraduates), increasing the stock of knowledge (discovery, patents, and prototyping), and problem solving (contract research, cooperative research with industry, technology licensing, faculty consulting, providing access to specialized instrumentation and equipment, and incubation services). Many universities have now entered both short-term and long-term research partnerships with firms (Etzkowitz, 1999). Therefore, much of the current debate on university-industry links focuses on a narrow range of activities such as spin-offs and start-ups from universities and higher education institutes and the licensing of intellectual property (Cosh, Hughes, & Lester, 2006; Yusuf & Nabeshima, 2007). The university's function as a global resource pipeline is relatively neglected in the policy debate, but represents a distinctive set of activities in the innovation system.

Throughout the world, universities and the cities and regions in which they are located are discovering the mutual benefits of working together. Universities can help regions tap into a global source of knowledge and other resources through their multiple international linkages (Goddard, 2005, 2007). An emerging hierarchy of universities thus underpins the hierarchy of cities and regions. Global resource pipelines mean that structured resources (e.g., knowledge, financial and human capital) flow into local nodes of global excellence. Higher education institutions are more important than ever as mediums for a wide range of cross-border relationships and continuous global flows of people, information, knowledge, technologies, products, and financial capital.

Universities play a critical role in encouraging the global flow of knowledge, investment funds, and trained personnel through several mechanisms. Universities incubate the prototypes of networks and flows by creating social encounters among members. These include such public activities and functions as forming and accessing networks, stimulating social interaction, influencing the direction of research processes among users and suppliers of technology and fundamental researchers, meetings and conferences, hosting standards-setting forums, establishing entrepreneurship centers, and promoting alumni networks and personnel exchanges (e.g., internships, faculty exchanges), as well as joint industry-academia visiting committees and collaboration on curriculum development.

Universities that have world-class faculties and facilities can become magnets that successfully attract an inflow of foreign talent. The flow of human capital includes students involved in short-term exchanges, bachelor's degree and master's degree students accessing foreign degrees or becoming involved in cross-border joint degrees, doctoral students, postdoctoral researchers, and academic faculty involved in teaching, research, conferences and seminars, and other forms of collaboration and exchange (Bloom, 2005). During their studies, foreign students make key contributions to universities as research assistants and graduate teaching assistants. In countries where the law permits, many foreign students are recruited by local businesses after graduation and enter the local labor market.

In addition, pressure on national public funding for higher education in certain countries has encouraged or forced universities to seek additional income from the private sector or cross-border sources (European Communities, 2008). The long-term financial sustainability of universities is thus one of the key challenges they face today, in particular when it comes to their research activities. Research funding from the private sector and foreign sources is potentially important for universities. The fundraising success of leading universities such as MIT, Harvard, and Yale in the United States, and Cambridge and Oxford in the United Kingdom, is well known, but fundraising is not nearly as well developed in many places. To build capacity for fundraising, matching funds initiatives have been successfully launched in a number of countries, whereby private donations over a certain limit trigger a matching donation from the government up to a certain percentage of the private gift. These initiatives imply a diversification of university funding, notably by working within a framework of greater public-private partnerships (Conraths & Smidt, 2005). Greater autonomy to universities is also the key to successful fundraising. This includes financial (budgeting, generating income, and borrowing money; investing in money markets), organizational (structure of the university), and staffing (responsibility for recruitment, salaries, and promotion) autonomy. The main goal should be to raise funds for R&D in a more flexible environment and to use these funds in a more flexible manner. In situations where the institutional setup of universities does not give them the autonomy and flexibility that fundraising requires, universities can explore the possibility of creating their own foundations. Until recently, relatively little attention had been paid to the role played by the private nonprofit sector and, more particularly, by foundations that fund research activities in boosting the overall level of investment in R&D.

Adopt flexible intellectual property strategies to encourage transfer and exploitation

Intellectual property rights (IPR) legislation in its current form provides exclusive, very broad rights for a long time. The dynamics of sharing information, knowledge, and ideas in the new open innovation paradigm is made difficult by IPR legislation that provides exclusive and strong protection. Intellectual property strategy in this very fast moving business environment needs to be flexible to ensure that the IPR portfolio is relevant to products and services (IBM, 2006). Open innovation requires research organizations and firms to be more flexible about their intellectual property management. They must employ a mix of proprietary and nonproprietary IPR strategies to maintain a balanced portfolio and to

encourage collaboration (Andersen, 2008).

Proprietary IPR strategies range from simple buying and selling, licensing out or in, and sharing the IPR to more complex arrangements such as cross-licensing and pooling of IPRs. Patent pools play a key role in businesses that are driven by standards. Pooling is an effective tool to introduce new technologies, since the members of each pool must consider the right market price for the intellectual property (IP) they hold when setting licensing terms for companies that implement the standard. IPRs in nonproprietary environments concern appropriate and less exclusive IPR protection. This means changing the terms of IPR protection from *all* rights reserved to *some* rights reserved. An IP license (e.g., General Public License (GPL) or copyleft license) allows every person who receives a copy of an invention or work the same rights to study, use, modify, and redistribute the invention or work, as well as versions derived from it.

One successful model for using IP as an enabler to facilitate collaboration is Europe's largest research center for microelectronics research, the Interuniversity Microelectronics Research Center (IMEC) in Leuven, Belgium. IMEC is a nonprofit organization established by the State Government of Flanders. It is an independent R&D organization with more than 1,600 staff, and it collaborates with many partners worldwide. IMEC has been financially successful since it attracts research funds from many streams of the private sector. The center receives only about a quarter of its budget from the government, the balance coming from contracts with industry, including regional companies and international companies.

IMEC has developed a forward-looking business model that relies on intensive cooperation with local firms and university researchers. One of the innovations that contribute to the success of the IMEC model is a flexible IP strategy. IMEC divided its IP into two main categories: background IP and foreground IP. Foreground IP is IP solely owned by individual member-organizations. Background IP is similar to the IP platform; it is jointly created and jointly owned by member-organizations and IMEC. The Industrial Affiliation Program (IIAP) is IMEC's premium R&D cooperation formula for joint R&D between industrial researchers and IMEC research teams. The concept is based on a sharing of cost, risk, talent, and IP. IIAP is recognized worldwide as one of the most successful international partnership models for joint development of next-generation technologies. IIAP partners get the opportunity to send one or more researchers to the IMEC premises to work in teams comprising IMEC researchers and residents from other IIAP partners. For each industrial partner and within each program, there is room for more customized R&D. Affiliate firms receive a royalty-free, non-exclusive license on all background IP and receive access to certain foreground IP developed not just by IMEC but by its other industrial affiliates, as well.

Holst Centre inside Philips High Tech Campus is another landmark R&D joint venture. The center was initiated by two large research organizations—IMEC (Flanders, Belgium) and TNO (the Netherlands), with support from both governments. Holst Centre now has more than 15 leading industrial partners and more than 16 academic collaborations. It operates as a program organization, offering industries research based on well-defined road maps and with an open style toward emerging markets and future applications. Research is performed up to demonstrator level, and partners can further commercialize the results into a product. A beneficial transfer of technology to the industry is guaranteed and market requirements can be anticipated. The Holst Centre IP model is inspired by IMEC. Industrial residents that pay a participation fee can gain access to background IP and non-exclusive right of use. With an additional entrance fee, firms can take part in precompetitive programs and obtain co-ownership of IP with collaborators. There are certain types of programs by which only exclusive IP is developed. Multiple options create conditions so that joint parties are willing to bring in and share IP.

Build new mechanisms and models for knowledge collaboration

Boundaries between domains of knowledge represent significant edges for innovation. Today, industrial knowledge is only rarely disciplinary knowledge; rather, it is synthetic knowledge that is generated through the repeated combination and reconfiguration of diverse disciplines and expertise. Networking is an effective way to combine individuals' knowledge and skills in the pursuit of common objectives. Yet, knowledge networking is not easy to define or describe. It is a rich and dynamic phenomenon in which knowledge is shared, developed, and evolved. In Europe, various mechanisms exist to promote joint partnerships in R&D and technology development. The EUREKA initiative aims to raise the competitiveness of European industry by funding projects that increase cooperation between firms and university research institutes in areas of advanced technology. The Framework Programmes for international partnerships are slowly moving away from sector-based research to projects that require a high degree of interdisciplinary cooperation and that involve several member states. Recently, another aim of cross-border partnerships has been the promotion of networking among and between actors of national innovation systems (e.g., between international consortia of firms and universities, business-to-business relations).

The real challenge to innovation is not the absence of ideas, but the ability to mobilize a critical mass of resources behind promising ideas and to create the mechanisms to more rapidly test and refine ideas as they move from concept to delivery. Myelin Repair Foundation (MRF) based in Silicon Valley is a nonprofit research foundation which developed a radical open-source platform as a new approach to accelerated collaboration in medical research. The Accelerated Research Collaboration (ARC) model is based on co-creation among a closed group of researchers who aim to develop a drug that will treat multiple sclerosis. The foundation helped to create a distributed network of researchers within such

diverse academic disciplines as neurobiology, immunology, and neurology from independent academic institutions in the United States. It provided an infrastructure enabling scientists to share discoveries and to coordinate simultaneous research projects to accelerate discovery. Lawyers engage with the researchers at an early stage of the research process to identify patent opportunities and document contributions to the discovery process so that appropriate researchers are credited for their contributions. MRF signed intellectual property agreements with each of the academic institutions involved, with which it will share royalties generated from discoveries it has helped to fund. The ARC model accelerates the discovery process by finding ways to more effectively coordinate research activities across distributed teams in very different disciplines and across major institutional boundaries. By using practices of the co-creation model of R&D, MRF completed its work within five years, much faster than the time required by current research models, and half the royalties will be put back into the foundation to finance future projects.

Living labs function as an ideal network of clusters that enable faster cooperation between users and providers and, most importantly, as a network that uses the city as an innovative arena where the involvement of users is always the focus of attention. Many European regions or city-areas seem to be those that operate as if they were full-scale urban laboratories or regional proving grounds for prototyping and testing new technology applications and new methods of generating and fostering innovation processes in real time. These city-regions, and the firms located in them, seem to be actively riding the wave of modern information and communications technologies rather than simply adapting them. Here, professional and other user communities play a significant role in identifying needs, shaping applications, and creating effective interactions between inventive producers and users of technology for truly innovative applications. The European Network of Living Labs establishes a European platform for collaborative and co-creative innovation, where the users are involved in and contribute to the innovation process. Living labs are real-life development platforms for testing services with user communities in their own living environments. Open and co-creative innovation involving user communities in the development processes generally results in more acceptable solutions and better success rates.

Support intermediary and bridging organizations

As diffusion of knowledge is just as significant as its creation, more attention should be paid to knowledge distribution mechanisms comprising the linkages between agents and structures that support the advance and use of knowledge. The narrower the interface to the external environment, the less knowledge and ideas are absorbed. And, the fewer people internally who come in contact with external ideas or knowledge, the lower the likelihood that they will trigger innovation. Until recently, relatively little attention had been paid to the role played by the private nonprofit sector, which acts as an intermediary, matching specialized knowledge production and specialized user needs. These intermediaries can take multiple forms, including knowledge transfer professionals, evidence hubs, business advisers, field specialists, land management agents, knowledge transfer consultancies, technology transfer companies, knowledge networks, and skills development agencies. They are alert to opportunities and threats and provide valuable connections (e.g., putting people who have problems in touch with those who have solutions, putting people who share similar needs and are tackling similar problems in touch with each other).

For instance, InnoCentive connects a virtual global community of 50,000 qualified scientists to help its clients seek solutions to high-tech problems. They tap into inexpensive, but talented problem solvers in Russia, China, India, the EU, and North America. Firms post problems anonymously on a Web site. Solutions are submitted and InnoCentive, as the go-between, provides problem-definition assistance. Medicon Valley Alliance in the ScanBalt BioRegion is a consortium for the players in Medicon Valley. It facilitates interaction between many different kinds of life sciences-related companies. This interaction ensures a dynamic environment of innovation and knowledge sharing and the constant formation of spin-offs. Global Connect is a network directly inspired by Connect in San Diego (founded by the University of California, San Diego, and the local community in 1985) and bearing the Connect name. Global Connect assists enterprises it serves to connect with resources in other regions around the world. In addition, many foundations not only bring with them money (quantity) but also competencies and unique characteristics (quality) that contribute to the pluralism of R&D funding. The importance of foundations in generating income from their endowments and raising money from the general public and the private sector to support research needs to be addressed.

CAPABILITY OF NETWORK GOVERNANCE

Trend of multi-actor networked governance

Governance system on the vertical dimension refers to the linkages between higher and lower levels of government, including their institutional, financial, and informational aspects. In many countries, innovation policies have often been implemented using a top-down approach. Policy making is devised by national governments and either operated at the national level or implemented by regional and local governments. However, as international and local authorities are increasingly becoming arenas and actors of science, technology, and innovation policies, policy making becomes much more locally driven (George, 2004; Bache, 2008). National and regional innovation policies are generated in a more bottom-up way, involving close partnerships among local actors (Cappellin, 2007). Coordination stands out as a crucial problem under multi-level interactions because, as the number of actors increases, decisions must be negotiated and

transaction costs rise tremendously.

Governance system on the horizontal dimension refers to cooperative arrangements among different ministries, regions, and municipalities. It is acknowledged that ministries form different camps in terms of their functions and objectives. Tensions arise between ministries for knowledge infrastructure such as education and science, ministries for industrial sectors such as commerce and the economy, and ministries for welfare such as social affairs and health. These three groups have quite different outlooks on innovation, and it is difficult to reach consensus because the three groups have been competing with each other for resources. Tensions also exist between ministries that take an ownership role of macro-level policies and ministries representing sector-specific policies that hold a strong or special position in the country. It has been documented that in some countries, ministries that represent traditional sectors have a long history of quarreling and competing over their respective authorities with any new establishment. Developing horizontal linkages within a country among industrial, innovation, and higher education policies is an important issue (Edler, Kuhlmann, & Smits, 2003).

Public governance must be aware of vertical coordination between different layers of government bodies—between international, national, and local governments and also between the government cabinet, various ministries, agencies, and research institutes. While the nation state provides the overall organizing framework, recently, individual and often local institutional actors, operating in conjunction with nationally determined initiatives and strategies, comprise the new framework of multi-level governance processes of policy and innovation. Additionally, it is extremely important to improve horizontal coordination between national, regional, and city governments and organizations at the same layer of the administrative entity, such as ministries or agencies. It implies not only a need to broaden the focus from the original innovation platform to more generic policy areas, but also the possibility of reorganizing institutional setups, procedures, and practices for cross-sector policy making, including agenda setting and prioritization, implementation, and policy learning.

In the face of such challenges, governments are looking for new, more collaborative mechanisms that work through networks rather than hierarchies (OECD, 2001, 2005). First, the government can create an entity that covers a broad range of players with wider responsibilities. Policy councils or committees are often considered excellent examples of high-level bodies capable of coherent and efficient governance of macro-level policies. Council members have to be major players of the government. With the support of professionals and external experts, all members work together to reach common policy goals. This top-down but consensus-based approach is commonly adopted by the EU and the governments of Finland, the UK, Japan, Korea, and France. They establish high-level policy councils or committees to deliver authoritative, negotiated policy recommendations.

Second, the government can change policy and program design from a hierarchical style to a more network-type initiative, such as a framework policy. Framework policies are policy packages, including a hierarchy of overall priorities, areas of effort, sub-area priorities, and a range of different policy programs, policy instruments, and policy actions. The plan-based approach is easily adopted in countries where a planning regime is strong, such as the EU, Japan, and Norway.

Third, the government can strengthen the role of selected ministers or cabinet administrators to coordinate different organizations. Japan and Korea provide good examples of using selected ministers as interfaces for policy integration. Effort to deliberately rotate top ministry officials to different positions for different time frames is also made. This might become an alternative to facilitate future interdepartmental governance.

Fourth, the government can enhance the culture of collective learning among the existing coordinating bodies. Culture and competence in the coordinating bodies certainly sets the conditions for interaction with other coordinating actors. Countries such as Switzerland, Germany, the Netherlands, Demark, and the UK have quite a strong culture of using expert opinions and strategic intelligence to facilitate systemic and collective learning.

Communication is the key

Many countries have devoted effort to enhancing their institutional structure with a view toward improving coordination. Despites these efforts, however, the traditional bureaucratic setup based on administrative rules and functional specialization can result in total inflexibility. Competing advisory structures, competing policy-making institutions, and implementing agencies overtaking the policy-making function are creating stress in the system that might be counterproductive.

The key element for a highly fragmented formal system to continue functioning actually lies in a largely informal system of communication and information sharing. Ad hoc platforms established by some governments have already put the idea into practice. The Innovation Platform in the Netherlands, with high-level representatives from the government, industry, and universities, was chaired by the prime minister himself. The Innovation Platform has a small secretariat and is not an official advisory committee. It is not established by law and has no budget. Its purpose is to offer suggestions for improving the linkage between firms and the public knowledge. As an ad hoc coordination mechanism, the Innovation Platform relies on the high profile of its members more than its official status. However, this type of communication is not uncommon. The Science, Technology and Innovation (STI) System in Denmark, which was established recently, demonstrates a similar idea. In addition, a key ingredient for coordination seems to be the long-term presence of a rather stable informal group of experienced policy makers who trust each other well enough to

transcend the (narrow) specific interests of the organizations they represent. A common (professional) language is established for communicating problems and solutions. The STI inner circle's role in setting the agenda is quite big and is an especially important quality of the governance system. Also, emerging collaborative technologies can greatly facilitate cooperation across different environments and platforms. Virtual collaboration technologies, such as those based on the Web, can substantially improve the quality and ease of inter-organizational collaboration.

CONCLUSION

The past decade has seen the sweeping globalization of R&D, as corporate innovation systems have become international in scope. The rise in collaborative research and development efforts among corporations, their suppliers, universities, and government labs is a clear indicator of the trend toward evermore dependence on distributed, external resources of technology. These changes affect the way government intervenes in the areas of innovation policy. Public governance needs a more integrated (multidisciplinary), more open (more actors involved), and more demand-steered approach. The government can play an important role in collaboration and networking by providing support and appropriate incentives As global open innovation matures, it is wise to remember that networking is a process that often takes place spontaneously in the market without much government support. Thus, there will be a shift from direct intervention to more indirect inducement.

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