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Networking Innovation and Business Support Infrastructure*

1. International innovation and business support infrastructure

Introduction

Economic conditions have changed considerably in the world's industrialized nations in the last decades. The combination of technologies and economies of scope has emerged as an important source of job creation and growth.

During the 1960 and 1970s, and particularly following the oil crisis, most countries increasingly recognized that innovation was a crucial element of competitiveness in the manufacturing and service sectors. They began to develop technology policies either to stimulate the transfer of public research results to create new products and processes or to enhance private sector efforts to innovate, notably through increased investment in research and development (R&D). These policies have taken the form of large public programs

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and procurement in high-technology sectors, incentives to engage in R&D, assistance in patenting, and deregulation of utilities. Over the last decade, a policy shift has taken place. Recent academic analysis of empirical evidence on the innovation process has shown no mechanical relationship between investment in R&D and innovation; rather, new products and processes appear to be the result of the involvement of many companies and institutions in a common endeavor. Innovation is therefore seldom an outcome of the effort of a single company or institution. As a result, governments have directed resources to stimulate the emergence and strengthening of clusters of firms, links with research institutions and universities, and knowledge diffusion. Innovation and business support infrastructure such as Science Centers, Technology Parks, Technology Transfer Centers, Innovation Centers, or Business Incubators are particular features of these new policies. They are a structured community dedicated to the development of innovation. They usually bring together in one location (or spread across a region) the components necessary for making innovation happen: academics, research institutions, and enterprises. However, they mostly rely on momentum and a long-term vision elaborated by community leaders. The intangible side (scientific knowledge, social consensus, entrepreneurship) is as important as the material side («hard» infrastructure, technology facilities, R&D investment).

Support policies increasingly depend on the capacity of innovation and business support infrastructure to contribute to the development of entrepreneurship, to participate in cluster initiatives, to generate spillover effects, and more generally to enhance the regional culture of innovation. For policy makers, innovation and business support infrastructure is not to be developed for their own sake but must contribute to the building of learning regions and knowledge-based territorial economies. The bursting of the high-technology bubble at the end of the 1990s made clear the need to respond to local and regional demand rather than systematically embarking on high-technology research.

The issue is to transform innovation and business support infrastructure so that it benefits the countries' economy sustainably.

Introduction to Networks

Networks are characterized by geographically dispersed communities of practice with common interests, shared needs, and participants with a similar identity. The sum of the parts benefits the whole network. Network members have functions within the group, and the flow of communication between communities of peers contributes to synergy and achieving best practice.

Innovation is a function of changes in technology, organization, and social practice, and the pace of knowledge exchange and uptake of new ideas and technologies are extremely important. Because networks facilitate speedy diffusion, they are helpful to innovation. Innovation networks are communities of technological practices: they support organizational learning, and they allow for increased specialization and the combination of resources. Such networks act as «innovation thought collectives» and can facilitate the paradigm shifts which are important for innovation uptake and disruptive technologies.

Networks usually organize information exchange mechanisms: meetings, conferences, training, access to experts, websites, databases, and newsletters. They stimulate activities such as technology transfer, and access to clients or finance

across geographic boundaries. They establish benchmarks of best practice, against which members can rate their performance against their local or international peers. They support professionalization of organizations and individuals within their sphere of interest. The networks themselves become learning organizations which promulgate good practice.

Networks vary greatly in scope: geographic reach, thematic focus, size, and organization. They may include: an industrial cluster with a shared technology or market; a group of innovation actors from one region or country; an international network of science parks; or special service providers. Networks relevant to innovation and business support infrastructure usually have specialized interests: a technology, such optics or bio-technology, or a special interest, such as sources of finance, for example the European Private Equity and Venture Capital Association (EVCA).

Establishing a new network involves formalizing relationships and developing financial models to pay for services, establishment of management structures, and formalizing procedures for service delivery. Sometimes networks are formed with public support, and members join the network by responding to calls for proposals, and are evaluated by the organizing public authority. Joining a network usually involves paying a membership fee and satisfying specific selection criteria.

Innovation and business support infrastructure participates in networks in different ways: the level of participation is determined by an organization's strategic intent and the resources it can contribute as a network member. This includes the important resource of human participation[1].

[1] Worldbank 2009 «Plan and manage a science park in the mediterranean- Guidebook for decision makers».

Origin of networks

Networks emerge in different ways. They may arise organically or from a top-down policy stimulus. Organically emerging networks are those that evolve naturally from a perceived common need among a group of actors. They may be companies in industry clusters coming together to agree standards, or organizations in an innovation park coming together to identify common service needs. A network that emerges from a top-down policy initiative is one for which a perceived «gap» exists. Policy-setting organizations allocate resources to provide support, through a network, to fill this gap. It is important to know how networks emerge, since their origin has a fundamental impact on their ownership and governance, and on how they function and grow.

When networks form spontaneously it is usually around a common interest. When companies share a common location, or interact in a supply chain, they may quickly co-operate on shared issues, and networks emerge rapidly. Inside innovation and business support infrastructure, companies often come together and form local networks to promote their interests. Industry clusters frequently emerge when large corporations are surrounded by subcontractors and/or component suppliers. Clusters can go beyond regional and national boundaries. International industries, which require large investments and high-technology rigor, give rise to networks of clusters across borders. International cooperation among networks of clusters becomes increasingly important in a global economy, especially when industries compete for limited resources, including access to expert knowledge. Supra-national clusters are found, for example, in the aviation, biotechnology, optics and pharmaceutical sectors. One

example of public support for international clusters is the project, Clusters Linked over Europe (CLOE), a European network of excellence for cluster management, matching and promotion, supported by EU programs. Networks also form to support specialized functions: for example patent marketing and technology transfer; turning innovative entrepreneurial projects into successful businesses, coordination with research organizations; or support on innovation finance. The possibilities are linked to needs of innovation and business support infrastructure and their clients.

Policy initiatives support the formation of networks. In the European Union (EU), SMEs represent 99% of all companies in the EU. They are the biggest sector of the EU economy, with 23 million enterprises employing around 75 million people responsible for the creation of one in every two new jobs. SME produce considerably more than half the EU's GDP. However SMEs find it very difficult to operate outside their local market, although their participation in a European marketplace would be beneficial for global trade. Therefore, many public initiatives organize specialized networks to support SMEs' operations beyond national boundaries. For example, public initiatives have formed networks: to support technology transfer between SMEs; to introduce venture financiers to small high-technology companies; and to help high-level researchers move between universities and specialized high-technology companies. Sometimes, public-private interests cooperate to develop groups of incubators or science parks in a country, which lead to national networks. The focus here is often on technology-led urban development, and on synergy between universities and industry.

Networks of innovation and business support infrastructure operate in parallel in some countries: some are formed on a purely commercial basis, and some with public funding and public objectives. These networks can co-exist and offer different types of services to their members. The overall intention of all these networks is similar: to come together to share knowledge and resources and to improve outcomes. The manner in which networks develop is different: Experience proves that there is more than one path to success for network-based development[2].

Networks are often organized in tiers: first as small consortia organized on a regional or national basis, and then into super-networks at international level. In many countries, innovation and business support infrastructure forms national or specialized networks, such as the United Kingdom's Science Park Association (UKSPA). Representatives from these national bodies also meet with those from other countries in international networks. Finally, networks coordinate internationally in organizations such as the International Association of Science Parks (IASP) and the World Technopolis Association (WTA).

Connection between innovation and business support infrastructure and networks

Innovation and business support infrastructure forms, or links into, networks to: formalize relationships that bring synergy and benefits to stakeholders; benefit from connectivity and synergy across the

[2] See on this point the conclusions of the workshop Innovative Metropolitan Territories: Technology Parks and Competitiveness Clusters organized in June 2007, in Tunis, Tunisia, by the **World Bank, Marseille City Council and GTZ,** in partnership with the Urban Community of Marseille-Provence Metropole, Marseille Innovation and the Marseille-Provence Chamber of Commerce and Industry, and under the patronage of the Tunisian Ministry for Research, with the support of Tunis City Council.

network; enhance services provided to clients of innovation and business support infrastructure; develop network members through professionalizing services; and undertake benchmarking between network members. Each of these aspects of network membership is examined below.

Networks tend to emerge from shared interests and the need for a common exchange platform. The shared interest may be a shared goal, proximity, a common client, or a single technology. Shared interests may include, for example, cooperation on the design of components for a common client or industry. Networks can grow organically, formed by a group of actors with shared interests, such as clusters of companies or a group of business support organizations. At some point, the decision is made to formalize the structure. Networks serving this type of group are characterized by an interest in industry standards, a common technology, or streamlining delivery cycles. These clusters may be small, and deal with local interests: agro-food technology or common tourism campaigns, for example. Clusters can evolve into worldwide industry supply chains: aviation, optics, petro-chemicals, pharmaceuticals, telecommunications, etc. The differences in network needs are scaled to the size and scope of the cluster.

The creation of new networks can also be stimulated by top-down actions. Regional agencies and commercial innovation-support organizations can provide budgets or infrastructure to bring companies, or other relevant organizations, together. Urban development programs frequently bring industries together in one geographic location to profit from common infrastructure and to share state-of-the-art resources, including access to university knowledge. This can encourage the emergence of innovation and business support infrastructure, which in turn brings together various actors and support them in their common objectives. Networks that emerge in this situation may address: local infrastructure issues; national and international topics such as legislation on taxation or trade tariffs; or support for clients of the innovation and business support infrastructure. Networks that have emerged from this environment include, for example, specialized networks of science parks and incubation centers, and networks for assisting high-technology companies to access finance.

More recently, governments have undertaken innovation policy development, including foresight analysis, and the selection of specialized technologies. The intention is to pick fast-growth, high-technology sectors, to leap-frog industry cycles, and to have clean industries that provide local employment and support modern economies. Planning on innovation brings together high-level actors from research, education, industry, and many layers of government. The outcome may be islands of high-technology best-practice that peg themselves to international standards. These high-technology nodes must be linked to their international counterparts. In this case, networks may emerge from international research teams and universities, and public programs that support research. These high-level initiatives have given rise to specialized networks and exchange platforms, such as international technology platforms, or integrated industrial projects.

All networks, regardless of their size or focus, need some formalized agreement and structures and common exchange platforms (Internet forums, etc.) to reduce the costs of knowledge exchange. Developing new tools and platforms is not a trivial investment. How tools and platforms evolve, and are paid for, is linked to how the network emerged.

Networks emerging organically from industry clusters commonly have membership subscriptions. Local initiatives that bring industry together in one location, or a common network, may involve paying a rent or a membership fee, but may benefit from local government support. Top-down initiatives are commonly supported during both the inception and development phases. Financial support may take the form of paying, fully or partially, for research, network meetings, and a central secretariat. Over time, these initiatives may be expected to generate sufficient revenues to allow public sector support to be discontinued. Sometimes networks are not intended to be permanent and are discontinued when an initiative has reached its logical conclusion.

In addition, a number of networks address special innovation issues. For example, the struggle to grow experienced by small companies is largely dependent on access to finance. Two specialized networks in Europe support the innovation sector with mechanisms to improve access to finance: the European Business Angels Network (EBAN) and the European Venture Capital Association (EVCA).

Some networks also directly serve companies and individuals. The European Association of Research Managers and Administrators (EARMA) and the Pro-Ton Europe initiative both seek to support innovation management professionals through training, organized employment exchanges, and professionalization of individuals and organizations working to support innovation. They publish guidelines and training manuals for their members. Specialized networks offer services both to innovation and business support infrastructure and to their end-users. For example, the services may be the identification of technology transfer opportunities. Services may be targeted at SMEs as in the case of the INSME network. Network services are as varied as the clients of innovation and business support infrastructure.

Given that so many networks serve innovation and business support infrastructure, the issue is often how to identify which networks to join, and how to select the appropriate networks, given resource limitations, so as to optimize the exchange. Getting the best results from network membership depends on the network processes or exchange tools, and also on who acts as an interlocutor to the network. Exchanges with the network must involve a sufficiently high-level representative from the innovation and business support infrastructure to allow for strategic exchanges and high-level decision making. Moreover, the interface between the network and the innovation and business support infrastructure must be sufficiently active so as to bring decisions close to local actors and to create dynamic activities. Open exchange and knowledge sharing is the key to success.

Funding and Governing Networks

When networks formalize their existence they must chose a legal form (or legal personality). A legal personality is tied to an address, and therefore is governed by a legal framework. The type of legal personality adopted is commonly determined by the geographic base of the network, the intended scope of its activities, its stance regarding risk, and its intention regarding profit taking and taxation. Common types of legal personalities for networks in the EU include: limited companies, charities, foundations, European Economic Interest Groups (EEIGs), and consortia or projects funded by public organizations. In some countries, public sector support networks are established under

special, non-profit-making government charters. When EU public authorities seek to help establish new networks, they may publish calls for proposals or calls for tenders. This process is often governed by public procurement legislation.

It is quite common for networks to adopt a non-profit-making legal personality. The network can make profits on individual activities, such as training or annual meetings, but the overall objective of the network owners is not to tip profits out of the network but to reinvest any profit in network operations and development.

Having determined the appropriate legal personality, networks must choose the internal organization of their governance and control systems. Traditionally networks establish governing boards, executive boards, and/or secretariat services. In addition, they may have external expert advisory bodies. Board membership is determined by the legal personality and statutes, or charter, of the network. It is common for board members in a network to change over time and to reflect the distribution of stakeholders within the network. For publicly funded networks, the central secretariat is commonly fully funded by the interested public actors. Financial control is commonly ensured through mechanisms including a clear division between the governing and executive boards, financial audits, publication of financial reports, and rules on incurring costs.

The scope of a network's activities determines the costs it will incur. Network costs may include: IT tools (including an exchange platform, a website, a database); meetings (including training and annual conferences); the development of the network's common agreements or standards; publications (including promotional brochures and benchmarking reports); network administration (including a central secretariat). Networks with a private legal personality generally cover their costs though membership or subscription fees. Within networks that emerge from a public-sector call, members' integration in the network is partially or fully subsidized. It is possible to combine different funding mechanisms; for example, members whose network participation is paid for through subscriptions or public support receive core services free, but may be required to pay to participate in special services or events, including training or annual conferences.

Regarding subscriptions, it is common for networks to have more than one type linked to different membership categories. For example, members may be categorized as corporate members or individual members. Membership categories may be linked to the number of individuals who can receive network core services or attend meetings. Many networks seek corporate sponsors, particularly for the organization of events, or to cover large infrastructure costs. Typically sponsors have an interested relationship with network members, and both benefit from the sponsorship deal.

The governance and funding of networks is rarely static. In fact, networks lend themselves to changing structures. For example, the European Commission (EC) established two networks: the Innovation Relay Centre (IRC) Network, and the European Information Centres (EIC), both of which were organized on a regional basis though national and regional nodes. These networks had separate central secretariat services following calls for tenders. The secretariats were made up of private organizations organized in consortia. At some times, the secretariats were responsible for members' contracts and at other times for network members' performance review and support, but not contracts. In 2008, the two networks were

combined into a single network called the Enterprise Europe Network (EEN), and its governance was assigned to the Executive Agency for Competitiveness and Innovation (EACI). The network is open to non-EU members. Partial funding of members by the EC is possible, based on their location, if the interested country has a cooperation agreement with the EU.

Examples of networks of innovation and business support infrastructure

Innovation and business support infrastructure has formed a variety of networks which are organized regionally, nationally, and internationally. In addition, innovation and business support infrastructure groups itself into networks that offer special support. Technology transfer, business services or incubator support, industry clusters, and innovation finance are just some examples.

National science park associations form networks. For instance, the mission of the United Kingdom Science Park Association (UKSPA) is to be the authoritative body on the planning, development and the creation of science parks that facilitate the development and management of innovative, high-growth, knowledge-based organizations. However, membership of UKSPA is not restricted to UK-based organizations. UKSPA members are involved in the following networks: EBAN, EVCA, and IRC, and the International Association of Science and Technology Parks.

In many cases, science parks are involved in more than one network. AREA is a predominately public initiative in Italy which brings together research and public organizations and was founded in 1978 as Italy's national science park coordinator. AREA is a multi-sector science and technology park that carries out research, development, and innovation activities aimed at achieving excellence. It is a reference in Italy for technology transfer. AREA is a member of APRE, an Italian network that promotes the creation of partnerships enabling research bodies and regional companies to take advantage of European research programs. To support technology transfer, AREA joined the IRC Network, now EEN, by responding to an EC call for proposals. To provide services to new entrepreneurs, it joined EBN European BIC network. To support exchanges of highly qualified researchers, AREA joined ERA-MORE, the European Network of Mobility Centers. AREA is finally a member of HiCo, Hi-tech Integrated Cooperation, and a technical and economic development network in the border regions of Friuli, Venetia, Giulia and Slovenia.

Major European and international networks of science parks and innovation and business support infrastructure

Launched in 2008 by the European Commission, the **EEN (Enterprise Europe Network)** combines and builds on the former Innovation Relay Centre (IRC) network and the Euro Info Centre (EIC) network, established in 1995 and 1987, respectively. The IRC focused on technology transfer and the EIC on business information and support. The network is made up of regionally or nationally organized networks, coordinated centrally by the Executive Agency for Competitiveness and Innovation (EACI). In 2010 the EEN is present in 45 countries, with around 4,000 experienced staff in 600 local partner organizations providing expert advice and services to EU businesses. Organizations outside the EU can submit proposals to join at a later date, on a non-funded basis. The new integrated network offers a one-stop shop to meet the information

needs of SMEs and companies in Europe.

The **EBN European Business & Innovation Centre (BIC) Network** was set up in 1984 as a joint initiative of the European Commission, European industry leaders, and Business and Innovation Centers. EBN is now a major non-governmental pan-European network bringing together over 200 Business & Innovation Centres (BICs), and similar organizations such as incubators, innovation and entrepreneurship centers across the enlarged Europe. BICs are organizations which promote innovation and entrepreneurship. They drive the creation of start-ups by support to innovation, incubation and internationalization. EBN provides help and support to these BICs by acting as an interface with other organizations by providing expertise in numerous areas including funding and by stimulating the sharing of best practices. EBN membership entails payment of an annual membership fee. EBN membership is organized into two categories: Full members and associate members. Full membership is awarded to business and support organizations (BICs) implementing the EBN quality assurance system involving a quality charger and self-assessment protocol.

The International Association of Science and Technology Parks (IASP) is the worldwide network of science and technology parks. It was created in 1984 and has its headquarters in Spain. IASP connects science park professionals from across the globe and provides services that drive its members' growth and effectiveness. Members enhance the competitiveness of companies and entrepreneurs of their cities and regions and contribute to global economic development through innovation, entrepreneurship, and the transfer of knowledge and technology. In 2008 IASP had 359 members, involved 150,000 companies located in IASP member parks. in 74 countries and five regional divisions: IASP Asia-Pacific, IASP Europe, IASP Latin America, IASP North America, IASP West Asia. Between 1984 and 2007 IASP organized 24 world and 42 regional conferences. IASP is a founding member of the World Alliance for Innovation.

Another example of a network of Science parks is the **World Technopolis Association (WTA)**, a multilateral cooperative international organization. The main goals of the WTA are to promote regional development and prosperity through exchanges and cooperation among science cities and to contribute to the happiness and well-being of all peoples through the advancement of science and technology. The World Technopolis Symposium in 1996 was a preliminary event which led to the establishment of the WTA, which formally emerged in Daejeon, Korea. The Daejeon Metropolitan City has made special efforts for the WTA: first, it has sought the United Nations Educational, Scientific, and Cultural Organization (UNESCO) as an affiliate; second, it has set aside part of the city municipal budget for the WTA and secured a subsidy from the Korean government. The WTA is pushing ahead with international cooperative research projects and building an information network among members.

Other critical networks

A number of specialized networks do not focus on bringing innovation and business support infrastructure together. Some target services offered by the innovation and business support infrastructure to its clients. Other networks form to support specialized functions: for example, TechnologieAllianz is a German network of patent marketing and technology transfer agencies. Many specialized networks op-

erate internationally, but are organized nationally[3].

A number of specialized networks support access to funding (business angels, venture capital, sectoral funds, etc.). One of these, the European Private Equity and Venture Capital Association (EVCA) represents the European private equity sector and promotes the asset class both within Europe and throughout the world. EVCA's role includes representing the interests of the industry to regulators and standard setters; developing professional standards; providing industry research; professional development and forums; facilitating interaction between its members and key industry participants including institutional investors, entrepreneurs, policy makers and academics. EVCA's activities cover the whole range of private equity: venture capital (from seed and start-up to development capital), buy-outs and buy-ins.

A network can serve more than one need of innovation and business support infrastructure: It can be both a network that provides support to it's' employees or stakeholders and specialize in a technology relevant to it. The Centre of Excellence for Applied Research and Training (CERT) was established in 1996, and constitutes a hub for a network of 13 higher colleges of technology in Dubai.[4]

One of the more important aspects of network participation is synergy and exchanges of experience. It is not only top-level decision makers who participate in networks. Those who implement various innovation and business support infrastructure's services and provide support to clients can learn from, and share, their experience in networks. Innovation and business support infrastructure joins many networks to establish and maintain connectivity and synergy in, and between, the innovation and business support organizations, to connect to the local and wider region, and to support special interests[5].

Sometimes, specialized clusters are very large, especially in industries requiring world-class technologies. Representatives of France, Germany, and Switzerland, working in life sciences, business, and economic development, helped to create a network of science, industry, politics, and finance. Cooperation between life-sciences and medical-technology companies, including major global players in the phar-

[3] Among other examples, there is the Red de Officinas de Transferencia de Resultados de Investigación (RedOTRI), the Spanish Network of University Knowledge Transfer Offices, or the **European Network of Mobility Centers for Researchers** (ERA-MORE) for researchers wishing to work in another country than their own and for organizations willing to recruit talented European and non-European researchers. A support network exists in 32 countries through 200 centers. Services provide information on research fellowships and grants, at European, national, and international levels. The service is free of charge and supported by the European Commission. The National Scientific and Technological Research Council of Turkey (TÜBİTAK) uses ERA-MORE to draw its skilled scientists back home to Turkey.

[4] CERT operates two science and technology parks, one in Abu Dhabi and one in Dubai, which provide access to world-class experts in technology through more than 20 multinational partners. The **Dubai Technology Park**, launched in 2002 by the Ports, Customs and Free Zone Corp (PCFC), is designed to attract foreign investment in research in oil and gas, desalination, and environment management.

[5] The **Baltic Association of Science and Technology Parks and Innovation Centers** (BASTIC) brings together associations of science parks active in the Baltic countries. There are three member associations: the Association of Lithuanian Innovation Networks (ALIN), the Latvian Association of Technology Parks, Centers and Business Incubators (LTICA), and the Association of Estonian Science and/or Technology Parks (AESTP). BASTICS is a member of: AESTP, a national network supporting trade (common market) needs; ALIN, a national network supporting trade (common market) needs; IASP, an international association of science parks, which allows for study visits and comparison of practices; EEN to support international technology transfer exchanges for BASTICS; LTICA, a national network supporting trade (common market) needs. Effective participation in networks involves many categories of innovation and business support infrastructure stakeholders.

maceuticals and agro-chemical sector, 40 scientific institutions and four universities, and about 280 research groups, has resulted in one of the largest biotechnology regions in Europe, called BioValley[6]. It goes beyond the organization of local activities and requires active cluster management.

Such interactions influence the services delivered and can help to professionalize innovation and business support infrastructure' services. It may be noted that only a small number of specialized networks relevant to innovation and business support infrastructure have been mentioned here.

Contribution to the professionalization of innovation and business support infrastructure's services

Networks serve the interests of innovation organizations, at the level both of the innovation and business support infrastructure and of individuals. Networks can support professionalization through: open exchanges and knowledge sharing, publication of materials that advance knowledge, staff exchanges, training, organization of exams, formal qualifications, identification of good practice, and benchmarking.

Participation in networks takes place through human interaction: individuals involved in innovation and business support infrastructure benefit from network participation, and can pass this benefit on to customers and stakeholders. Therefore, innovation and business support infrastructure can be improved through employee training and service improvements result from interaction with networks. Part of the process of service professionalization includes developing specific tools such as checklists, guidebooks, manuals, quality procedures, and general training materials.

Some networks focus on developing the individual as an actor in his/her organization. For example the European Association of Research Managers and Administrators (EARMA) focuses on the knowledge of individuals within their organization (university, research laboratory, etc.). Another example is Technology Innovation International (TII), an independent European association of technology transfer and innovation support professionals.

Some publicly supported initiatives organize and deliver formal training in innovation support skills. The ProTon Europe network, supported by EC research program funding, has organized professional training programs and qualifications for individuals responsible for innovation support. The training includes: setting up and managing a knowledge transfer office; patenting and IPR management; licensing; university-industry collaboration; and spin-off and campus companies. Finally professionalization can occur through benchmarking of services across the network.

Benchmarking innovation and business support infrastructure Performance

Benchmarking is an additional aspect of network membership and is relevant to

[6] In the late 1980s, the idea emerged to create a **«Silicon Valley» dedicated to biotechnology** in the Upper Rhine Region. A BioValley Promotion Team implemented the concept in the late 1990s, and a budget of EUR 2.2 million was received through EU regional/structural funds. A new legal structure for the BioValley was created, involving three national associations and one central tri-national association. In the mid-2000s, EUR 2.8 million was allocated from EU structural funds to «BioValley: from network to tri-national biotech cluster.» In 2008 **the BioValley** has 600 companies: including 40% of the world's biggest pharmaceuticals companies, and 50,000 biotechnology sector jobs. It has 40 scientific institutions, and 100,000 students. It includes 11 life sciences parks, 12 universities and academic institutes offering life sciences, biotechnology, chemistry or nanosciences curricula. It has over 30 qualified technology platforms for scientific services: screening, ADME, spectroscopy, NMR, phenotyping, clinical research, etc.

innovation and business support infrastructure' management. Benchmarking allows an innovation and business support organization to evaluate itself in relation to best practice across the network. This requires network members to agree to study their activities and to compare results and outputs, and to share this information, often in the form of a report. When benchmarking is undertaken on an ongoing basis, overall improvements across the network can be observed. Ongoing benchmarking is frequently linked to agreed evaluation criteria and performance indicators. All of this establishes quality systems and contributes to a process of continuous improvement.

Benchmarking provides a route to success. It facilitates planning to improve the quality of services within the innovation and business support infrastructure. As services are upgraded, all participants in the benchmarking process move towards best practice. Any deficiencies in results will provoke action plans to improve performance.

The Innovation Relay Centre (IRC) network, which focused on technology transfer, triggered a process to compare network member outputs. Common standards and outputs from the network were proposed by an advisory group and subsequently agreed upon. The types of outputs measured across the IRC network included: the number of cases in which technology transfer assistance was provided to clients, the number of technology transfer agreements, group meetings of participants, all compared across the network and taking into account the number of personnel in each network member or node. Annual reports captured results and, over time, overall network outcomes improved. Any network members who had difficulty in reaching outputs were supported by a central IRC secretariat, through training and direct interventions.

Another interesting example is provided by the Innovating Regions in Europe (IRE) network, created by the European Commission (EC) in the mid-1990s. Its aim was to facilitate the exchange of experience and good practice among European regions that are enhancing their capacity to support innovation and competitiveness among regional firms, through the development and implementation of regional innovation strategies and schemes. In 2008, over 230 regions were members of the IRE network. The majority of IRE regions have developed regional innovation strategies (RIS).

The European Commission published, in 2004, a call for pilot projects on benchmarking. The types of organizations involved were: regional administrative and political authorities, development agencies, and regional innovation support organizations. Eight pilot projects on benchmarking were launched, involving 36 regions across Europe. Some of the regions had leading industrial zones with high growth, and others were poorly developed or declining regions. The projects adopted different methods for benchmarking innovation strategies. Measures were applied to innovation strategies and services at regional, science park, and services levels. These projects made it clear that, even if innovation strategies exhibit significant differences, the results can be benchmarked with a view to improvement.

Activities of organizations within a network are very diverse, and selecting the outputs to be measured is a challenge. For instance, many innovation and business support infrastructures are established with the expectation that they will positively influence economic growth and technology-based developments in their environment or region. The strategy behind this thinking can be high-level, outcomes may only

be expected in the long term, and the outputs may be difficult to measure.

Benchmarking across network members contributes to a mutual learning environment. One of the expected outcomes of network membership is synergy. Benchmarking allows members to improve their performance to reach the level of the highest network performer. Networks that identify best practices, and compare outcomes, perform better than those that do not.

Conclusion international innovation and business support infrastructure

International networks vary in geographic reach, thematic focus, special interest, size, organization, funding, emergence, and level of member participation. They stimulate activities in specific areas, such as formulation of common services or standards; technology transfer; patent marketing; access to clients or to finance; internationalization; driving creation of start-ups; facilitation of international research consortia: promotion of mobility of researchers; or representation of member's interests to regulators and standard setters. They organize information exchange mechanisms by meetings, conferences, websites, platforms, databases, or newsletters. They support members' professionalism by access to experts, trainings, guidelines, good practices exchange and benchmarking, or performance rating and enhancement. Network membership requires membership fees (often), adherence to criteria, and time. Therefore adherence to networks must be carefully selected in order to make best use of scarce resource.

When selecting networks likely to fill gaps within Ukrainian innovation and business support infrastructure, questions should be considered like: What local, regional, national, and international networks exist and are open and of interest? Can the Ukrainian innovation center provide resources to participate fully in the network? What criteria have been established to choose between different networks? Who in Ukraine can be contributing to the network? How can exchanges be diffused form the network to Ukrainian innovation centers? Have measures been established on outcomes expected from participation in the network?

2. Ukrainian innovation and business support infrastructure[7]

National economies are increasingly interlinked. Innovation and business support infrastructure must be, too. [8]

However, there is no comprehensive provision of innovation and business support services in Ukraine according to EU standard. Innovation and business support infrastructure in Ukraine is underfunded and not equipped with tools, methodologies and knowledge to provide state of the art support services. Start ups and SMEs are most affected by this lack as they often cannot develop international networking on their own hereby often not being able to tap into knowledge needed to innovate and to develop commercially viable products and services at the speed and quality imposed by increasingly competitive and complex markets.

[7] Including outcome interviews with innovation projects Support to knowledge based and innovative enterprises and technology transfer to business in Ukraine, Development of financial schemes and infrastructure to support innovation in Ukraine, and Joint Support Office for enhancing Ukraine's integration in EU research area.

[8] Key features of innovation policy as a basis for designing innovation enhancing measures leading Ukraine to a knowledge-based competitive economy-Comparison EU and Ukraine; G.Rumpf, G.Strogylopoulos, I.Yegorov, June 2011, in Ukrainian.

Also Ukrainian innovation and business support infrastructure is 'under networked' when compared to their Western counterparts both bilaterally and within networks. Ukrainian innovation and business support infrastructure is not actively engaged in networks they are mostly unaware of. Having in mind the chronic underfunding of most business support organizations missing international links might seem as a minor problem. However, being cut out from accumulated international learning experiences, best practices, methodologies and tools ignites a virtuous circle. The downward spiral of professionalism of provided innovation and business support services makes it increasingly loosing their raison d'être for assisting Ukrainian business in becoming more competitive. Likewise the gap to state of the art business support infrastructure widens and its actors are less and less able to provide state of the art business support services designed to help client organizations become more competitive in the globalised economy.

A recent analysis suggests 147 innovation infrastructure actors in Ukraine comprising 16 Techno Parks and 24 innovation business incubators[9].

However, to many, these figures are highly overrated: According to the Ukrainian Association of Investment Business Association (UBICA) only 8 Techno parks (out of 16 registered ones) are operating. Experts estimate out of these only 2 or 3 of them are performing well. Furthermore, according to UBICA, to date there are only 10 active business incubators in Ukraine.

According to the opinion of Ukrainian experts, business incubators and business centers have not been working successfully in recent years [10]. They were focused much more on general commercial activities than on support of innovation enterprises. Innovation projects were few and small; they could not compete with projects in property development or merchandise trade. A similar situation presented itself with other forms of innovation and business support organizations. Partially, this could be explained by the fact that there are no special (indirect) incentives for creation and utilization of innovation in the country. Also state finances for innovative enterprises are scarce.

Due to the economic crisis new forms of innovation and business support infrastructure have not been developed in spite of sound declarations. Likewise the State Agency for Investment and Innovation (SAUII) had to create a number of regional innovation and business support centers in 2008-2009. However, in reality only first organizational steps were taken, and no innovation projects were supported.

Technology Parks[11]

According to some experts the most (and to some: the only!) successful measure in stimulation innovation was the creation of techno parks. The country's first techno park created in the early 90s in Brody, Western Ukraine, was not successful due to the lack of a sustainable business strategy. In addition, disputes relating to property rights for land and buildings created an insecure business environment, which discouraged the creation and expansion of new companies.

[9] Ministry of Education, Science, Youth and Sports presentation innovation forum, October 2009, Kyiv.

[10] Strikha M.V., Shovkaluk V.S., Borovich T.V., Dutchak Zh. I., Sedov A.O. Information and Analytical materials of the Ministry of Education and Science to the Parliamentary Hearings ' Strategy of Innovation Development of Ukraine in 2010-2020 in conditions of Globalizing Challenges' — Kyiv, MON, 2009 — 39 pages (in Ukrainian).

[11] With input of Igor Yegorov, Dobrov Center.

In 1999 a new attempt to create techno parks was made. In July 1999, another Law on Special Regime of Investment and Innovation Activities for Technological Parks passed Parliament. According to this Law, three new techno parks with some real financial privileges for innovation companies were created — Techno park in the Paton Institute for Welding (Kyiv), Techno park in the Institute of Semiconductors (Kyiv), and Techno park in the Institute of Mono-crystals (Kharkiv). They were created on the basis of leading institutes of the National Academy of Sciences of Ukraine with strong technological orientations. Tax and customs privileges could be received not by the institutes themselves but by specific (specially registered) innovation projects with the overheads they transfer to the techno park management were exempted from standard taxation procedure. Despite their privileges, techno parks contributed almost 905 million Hryvnas of different taxes to the central and local budgets in 2000-2008. They also created more than 3000 new jobs. However, the number of employees in techno parks dropped by almost 10 times in 2007 and in 2008. This means that techno parks worked in 'inertial mode' in 2007-2008 [12].In 2009 the Ministry of Education, Science, Youth and Sports reported 16 technology parks. They were registered after 1999 following a law on technology parks that set out a regime of tax incentives, reductions in duties and customs. Beginning 2005 the tax privileges granted to Techno Parks were abolished. According to the Ukrainian Business Incubators & Innovation Centres Association (UBICA) 8 Techno parks are still operating. Among them only 3 Techno parks sell innovative projects. These are the Electric Welding Institute named after E.O. Paton (Kyiv); the Institute of Monocrystals in Kharkhiv; and the Semiconductor technologies and materials, optoelectronics and sensing Technology Park in Kyiv.

However, according to international experts there is no innovation and business support infrastructure in Ukraine according to international standards. Ukrainian Technology Parks do not constitute innovation infrastructure according to international standards. They are legal entities that serve the founding research institutes to engage in commercial activities, e.g. to manufacture products based on intellectual property vested by said research institutes. Ukrainian Technology Parks offer no space for rent, nor any promotion for foreign direct investment apart from joining as legal partner to the Technology Park. They are not business infrastructure allowing businesses establish independent facilities. It may be worth investigating to set up a pilot Science and Technology Park hosting a business incubator in Ukraine.

Business Incubators

A current weakness in the Ukrainian National Innovation System is the continuous fresh supply of high tech start ups. While start ups are a vulnerable species everywhere in the world they face particular challenges in an economy of transition like in Ukraine. There is no legislative base for creation of innovative spin-offs from Ukrainian universities and there are no tools to stimulate innovative start-ups. However, experience and practical support to start up companies would be needed to improve efficiency, to avoid unnecessary work and mistakes. Also start ups need to be introduced well selected and prepared investment opportunities. In the EU some business incubators provide these services hereby enhancing the odds of success and

[12] Mazur O,A., Shovkaluk V.S. Technological Parks: Ukrainian and Foreign Experience. — Kyiv, MON, 2009 — 71 pages (in Ukrainian).

helping entrepreneurs and companies to become faster credible, taxpaying members of society. However, the currently existing few Ukrainian business incubators are often busy struggling with their own survival and are not prone to help entrepreneur to succeed. Often product-based ideas originating from diverse areas of expertise, research and practical business experience on the basis of protectable technology or information enrichment and scalable business models are not put into practice. This affects Ukrainian economy as it is often such business ideas that, if properly implemented, have the potential for creating new jobs, revenue of hundreds of millions Euro and lucrative exit for shareholders.

Overall, in Ukraine there is a shortage of supporting the creation of new innovative company set ups. According to UBICA there are 10 active business incubators in Ukraine. However, many business incubators are not primarily focused on innovative start ups but on other commercial projects, a tendency that had also been observed within the State Agency for Investment and Innovation (SAUII). The provided range of innovation and business support services is not complete compared to their Western counterparts.

Contrary to the EU, in Ukraine higher education institutes only rarely are among the founders of business incubators. The provisions of law prohibit universities to participate in almost all types of entrepreneurial activities, including the right to create companies, which are working on commercialization of R&D results. The establishment of the science park KPI could open the way for changes in the legislation, if it could show substantial positive results of its work.

Typically business incubators are supported by public sector schemes with modest contributions by entrepreneurs who avail of their services to create new businesses and jobs hereby providing an increased tax base. However, in Ukraine public private partnerships are largely underdeveloped. Also companies hosted by business incubators are observed to have an «all inclusive» mentality expecting 100 % funding from the state.

While it is desirable to foster the entrepreneurial spirit and propensity towards co-financing among tenant companies it remains the role of the state to fund the lion's share of business incubator operations. However, in Ukraine the share of financial support from the side of local authorities is small. Some experts estimate NGOs account for 50 — 80 % of business incubator financing. Without systematic support by local authorities and the state most business incubators cannot count on sustainable development. Business incubators have to choose either to transform into purely commercial enterprises (this may lead to loss of clients who hoped for certain preferential terms at the first stage of running business) or to reduce the volume of services they render to their clients (by refusing to lease business space, or by reducing other services). This limits their possibilities to obtain additional financing from donor organizations which connect the criteria of sustainable development with interest of local community and authorities in assisting and supporting projects financed by them. [13].

A European best practice is the European BIC (Business and Innovation Centre) Network (EBN) which spreads across the world. The project «Development of financial schemes and infrastructure to support innovation in Ukraine» is considering

[13] Sipos, Zoltan, and Szabo, Antal, Benchmarking of Business Incubators in CEE and CIS Transition Economies, (ERENET and Sintef, Budapest, Hungary), 15 June 2006, available at: http://www.erenet.org/papers/download/benchmarkingbusinessincubation.pdf .

facilitating the set up of Business & Innovation Centres (BICs), to link them as full members to the EBN European Business & Innovation Centre (EBN-BIC) Network, and to provide high tech start ups with dedicated funding instruments.

Cluster initiatives

In the EU and beyond thousands of clusters bring together small and large companies, universities and research institutes, business support infrastructure and regional public administration to stimulate collaboration in view to enhance production, marketing, and technological skills. This collaboration is often stimulated by cluster initiatives who organize joint branding, training, export promotion, etc. Usually cluster initiatives are kick started by regional authorities, and tend to be self sustainable after around 2—5 years.

In Ukraine there are currently neither clusters nor supporting cluster initiatives operating according to EU standards. Companies and research organizations in a given geographic area operating in the same sector tend not to collaborate. Rather, entrepreneurs and researchers tend to work in isolation hereby not developing synergies to further develop joint branding; export and domestic markets; entrepreneurial and export skills; raise productivity.; enhance competitiveness; production and logistics value chains; technology transfer; joint research; etc. Likewise business potential is untapped.

It may be worth fostering collaboration in some strategic clusters by launching and funding pilot cluster initiatives in sectors with growth potential.

Technology transfer infrastructure

Missing commercialization of research results to industry is one of the Achilles verses of the Ukrainian National Innovation System. There currently are no functioning technology transfer broker mechanisms or structures that assess, audit and matching technology needs and surplus of technology providers and consumers. The technology gap of already innovation adverse Ukrainian firms compared to international players is widening as a result. In spite of the fact Ukraine has a patent portfolio, university technology transfer offices and some acting technology transfer players, the existing initiatives are not working together. Rather, universities explore their Intellectual Property in an isolated approach so that it is difficult for companies to compare technology solutions offered by various universities. Technology transfer agents are not pro-active in matching technology needs with technology solutions. Rather technology transfer is understood as publishing publicly funded research results in databases without the active promotion facilitated by technology brokers. IT based technology transfer platforms do exist but they are not interconnected with each other hereby impeding user friendly access to all of them. It seems no player in the infrastructure is dedicated to assessing and promoting technology demands of companies to universities. Also there are not financial incentives promoting SME-university research cooperation. Overall, technology transfer actors facilitate few technology deals.

The gap between the higher education sector and industry in Ukraine is substantial. Current legislation does not allow universities or research institutes to be founders of a spin-off company with non-state ownership. The introduction of the Law on KPI Science park (2008) might change the situation but it is too early to make conclusions about the effectiveness of changes.

Business support infrastructure is to be equipped with appropriate resources

and with international state of the art business support services methodology and tools to help minimize and close this gap. The fastest way to do this is to adhere to partner with organizations that have a successful track record in brokering technology. A best practice is the Enterprise Europe Network (EEN) which success stimulated governments in four continents to fund EEN centers outside Europe. To date EEN spans the EU, Armenia, Bosnia and Herzegovina, Chile, China, Croatia, Egypt, former Yugoslav Republic of Macedonia, Iceland, Israel, Montenegro, Norway, Russian Federation, Serbia, South Korea, Switzerland, Syria, Turkey, and counting. The project «Support to knowledge based and innovative enterprises and technology transfer to business in Ukraine» has facilitated the set up of EEN Ukraine. Care must be taken to provide sufficient operating financing for consortium partners and associated members. Care must be taken to co-ordinate efforts of international, national, and regional technology transfer centers (be it regional/national technology transfer brokers, liaison offices at universities, technology transfer services at National Academy of Sciences, etc) to avoid duplication of services and resulting confusion of client organisations. Training to research centers on channels for technology transfer, negotiation skills, language (English) skills, and technology marketing skills will help market Ukrainian technology worldwide.

FP7 contact points — National Contact Points (NCPs)

A shortage within the Ukrainian National Innovation System is the overall reluctance of Ukrainian researchers to engage in international consortia and to engage in Framework Programme (FP) project. While the efforts of the NIP Ukraine have borne fruit it appears that a significant part of the country's research potential is not satisfactorily addressed and exploited since the NCP individuals provide NCP services on a part time basis and are therefore more focused on offering intra organization support. The development of a management and self-assessment tool is critical. There still is no scheme for concrete monitoring or for assessment of NCP services or a standard procedure for providing NCP services. A sustainable region wide support structure of National Contact Points (NCP) would help to reach and assist researchers across the regions to participate in FP. A well conceived NCP system is needed to contribute to strengthening FP participation and the working relations between Ukrainian and EU researchers. High expertise and provision of advanced level NCP services can be achieved by frequently organizing training sessions on advanced FP issues and experience sharing workshops. Care must be taken to adapt the NCP system to national policies, priorities and strategies, into national structures (government, research funding system, scientific and business communities), and to FP7 and European NCP networks.

To date Ukraine has one official INCO National Contact Point (NCP). The NCP system of Ukraine consists of a network of seven regional NCPs (Local Information Points — LIPs) covering some geographical regions. The National Information Centre for Ukraine (NCP coordinator), the National Information Center for Ukraine-EU S&T Cooperation (NIP) provides the Ministry of Education and Science with regular reports on conducted activities partially based on the reports received from the LIPs. NIP was established by the Ministry of Education and Science on August 1, 2003 following Order #514. It is hosted by Kyiv Center

for Scientific, Technical and Economic Information. Communication channels with EC officers and research performers outside Ukraine have been established and are maintained mainly by the NCP Coordinator. The LIPs depend on the contacts of the NCP Coordinator.

NCP services are provided by regional NCPs. The network of Local Information Points was established in 2003 and it is composed of regional state centers for science, technology and economic information as well as universities. NCP services are provided by a total of 9 physical persons on a part time basis and coordination of the regional NCPs is performed by the NCP coordinator. The NCP coordinator's activities are funded through a state financed project and some European funded projects whereas LIPs have been selected on a competitive basis and are directly contracted by the NCP coordinator for performing NCP services at agreed fees.[14]

No thematic specialization is established. Each LIP handles inquiries relating to all priorities. When advanced technical issues arise, informal signposting is activated on the basis of the professional background of the individual NCP or the research focus of its hosting organization. The NCP has a rather small access to academic clientele (if the NCP target group identity is compared against that of the Ukrainian research performers). This could be partly explained by the strong ties of the regional NCP individuals with their hosting organization. This implies that there might be a significant percentage of research performers which are not satisfactorily accessed. The links with the industry, SMEs and private enterprises are limited and vary depending on the region and the research focus of the host organization. Access and dissemination of information to potential clients that are located in remote areas is limited. Not all LIPs make a final proposal check mainly due to lack of human resources. The level of the FP expertise required also varies among LIPs.

Statistics prove the NCP has already linked some Ukrainian researchers to the Framework Programme (FP): In FP7, 107 Ukrainian organizations participated in 79 projects incurring 8,44 million EU co-financing (information obtained by head of NIP on 11.6.2010). The promising results could be enlarged by setting up and maintaining NCPs across FP7 thematic areas.

The project «Joint Support Office to for enhancing Ukraine's integration in EU research area» is setting up a comprehensive Ukrainian National Contact Point (NCP) support system with regional NCP nodes to be systematically trained by the central NCP. The Ukrainian NCP network will be linked with European NCP networks to ensure the dissemination of information regarding FP7 opportunities to their potential beneficiaries, recipients (universities, research institutes, and companies). Care must be taken to adapt the NCP system to national policies, priorities and strategies, into national structures (government, research funding system, science and business communities), and to FP7 and European NCP networks. The state Centres of Scientific, Technical and Economic Information (CSTEI), the Institutes of the National Academy of Sciences, and Ukrainian universities can be a suitable basis of the NCP structure.

Ukrainian innovation and business support infrastructure

Conclusions

National economies are increasingly interlinked. Innovation and business support infrastructure must be, too.

[14] IncoNet EECA: Analytical report on the NCP structure of Ukraine

Innovation and business support infrastructure is an integral part of a wider institutional setting for supporting start ups and small and medium businesses. Business and innovation infrastructure in Ukraine according to international standards should be set up. Regardless of their form (non-profit institutions, partnership between state and non-profit institutions, private, integral part of a university, etc.), business incubators, science centers, innovation centers, and techno parks must be linked with present economic needs and economic and developmental policy of the country.

Care must be taken to strengthen Ukrainian business support service providers. The public budget situation leaves limited room for manoeuvre and puts the imperative to spend public money wisely. Indeed a few effective business support providers providing the most urgent public serviced must be wisely selected, set up, trained and maintained. Areas to be found of particular relevance are technology transfer, promotion of high tech start ups, and facilitation of international research consortia.

Innovation and business support infrastructure is not developed for its own sake. It must prove to contribute to building of the country's knowledge-based economy. Some networks operate since decades. Ukrainian innovation and business support infrastructure can benefit from the network's cumulative learning experience. Ukraine is currently setting up EEN Ukraine and will join it to Enterprise Europe Network, (EEN). Ukraine plans to set up of Business & Innovation Centres (BICs) and to link them as full members to the EBN European Business & Innovation Centre (EBN-BIC). Moreover Ukraine is establishing a comprehensive FP7 National Contact Points system and will link it to EU NCPs.

It is expected that the collaboration within international networks and initiatives contributes boosts both the propensity and capability of Ukrainian innovation and business support infrastructure to provide state of the art support services hereby paving the way of Ukrainian industry to a knowledge-based economy.

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Инновационные сети и инфраструктура поддержки бизнеса

В 60—70-е годы XX ст. и особенно после нефтяного кризиса инновации были признаны большинством стран в качестве решающего фактора конкурентоспособности промышленного сектора и сектора услуг. Эти страны начали разрабатывать технологическую политику, нацеленную либо на стимулирование передачи в производство результатов исследований, полученных в государственных научных учреждениях, либо на расширение инновационной деятельности в частном секторе, в основном путем повышения размеров инвестиций в исследования и разработки (ИР). Такая политика реализовывались в виде масштабных государственных программ, стимулирования исполнителей ИР, помощи в получении патентов и т.п. Однако последние эмпирические данные свидетельствуют об отсутствии непосредственной связи между инвестициями в ИР и инновациями, а также о том, что новая продукция и новые процессы возникают в результате совместной деятельности различных институциональных структур. Это привело к смещению акцентов в политике, и сегодня правительства направляют ресурсы на стимулирование формирования кластеров фирм, связей между научными институтами и университетами и на распространение знаний. Кроме того, взорвавшийся в конце 90-х годов высокотехнологический «пузырь» сигнализировал о необходимости реагирования политики в первую очередь на технологические потребности на локальном и региональном уровне, в том числе путем формирования сетей (networks).

В статье раскрыто понятие сетей, их цели, функции, принципы работы, пути возникновения. Подчеркнуто, что сети возникают двумя путями — в результате политических решений («сверху—вниз») или самоорганизации субъектов на базе общих интересов, проистекающих из близости местоположения или производственной кооперации, причем возникающие таким образом кластеры могут иметь международные масштабы. Ввиду значительной роли малых и средних предприятий (МСП) в странах ЕС, которым, однако, очень трудно выходить за пределы местных рынков, многие меры государственной политики в этих странах направлены на содействие формированию специальных сетей для поддержки международной деятельности МСП.

Приведены примеры сетей, действующих на территории ЕС. Отмечена роль ассоциаций научных парков как организаторов и участников сетей. Представлена подробная информация об основных европейских и международных сетях с участием научных парков и инновационной инфраструктуры.

Кроме того, на территории ЕС созданы и действуют так называемые функциональные сети. Их основной задачей является не объединение субъектов технологической и инновационной деятельности, а предоставление конкретных видов услуг или поддержка конкретных функций, например маркетинга патентов, трансфера технологий, финансовая поддержка.

Отмечено, что одним из важных элементов деятельности сетей является бенчмаркинг — самооценивание участвующих в сетях организаций в сравнении с наиболее эффективными участниками сети.

Предложен алгоритм участия субъектов инновационной и технологической деятельности в сетях, который состоит из отдельных блоков контрольных вопросов на конкретных этапах формирования сети или присоединения к сети.

Приведена подробная информация о состоянии инновационной инфраструктуры в Украине, в том числе в сравнении с ЕС, а также предложены соответствующие рекомендации по ее совершенствованию на основе общепринятых международных стандартов.