

CREATING OF TRANSNATIONAL COOPERATION NETWORK AS A FACTOR OF COMPETITIVENESS

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Abstract: The paper presents good practices and selected problems of creating cooperation networks. The basics of creating and disseminating new forms of cooperation between enterprises and universities have been described. Based on the implemented international project "3DCentral - Catalyzing Smart Engineering and Rapid Prototyping", selected conclusions from creating network and management of many project activities including innovative technologies are presented.

Keywords: 3DCentral, transnational cooperation network, project management, rapid prototyping, smart engineering

1. INTRODUCTION

In the era of globalization, the involvement of enterprises in various cooperative relationships is based on the assumption that inter-organizational relations (to which these enterprises enter) may be a more important source of progress than internal characteristics such as size and technologies used. Cooperation between organizations is becoming increasingly important as an instrument for solving difficult economic and social problems.

Currently, the expansion of the scope of cooperative ties is necessary for at least two reasons. First, the industry is increasingly integrating science and production, which often hinders the strict separation of the production process from the phases of design and preparation of production. Secondly, the deepening division of labor enforces specific external links not only in the production phase, but also in the other phases of the product life cycle.

Based on the observation of the development of cooperation in industry, it can be pointed out that cooperative networks are becoming increasingly expanded both in number of the cooperating organizations and the scope of existing relationships. Technical relationships between cooperators such as specialized design offices, R&D centers, enterprises conducting marketing research, etc. have a special role. This requires the creation of control systems capable of managing distributed knowledge and intelligence.

Cooperation can take various forms: from joint strategies based on cooperation agreements by network organizations and modular partnerships, in which all economic activity (not at the core of the agreement) is outsourced to subcontracts as shown in Fig. 1. Other forms of cooperation are virtual corporations that only exist as temporary collections of agreements between enterprises that share their core competencies for short term cooperations.

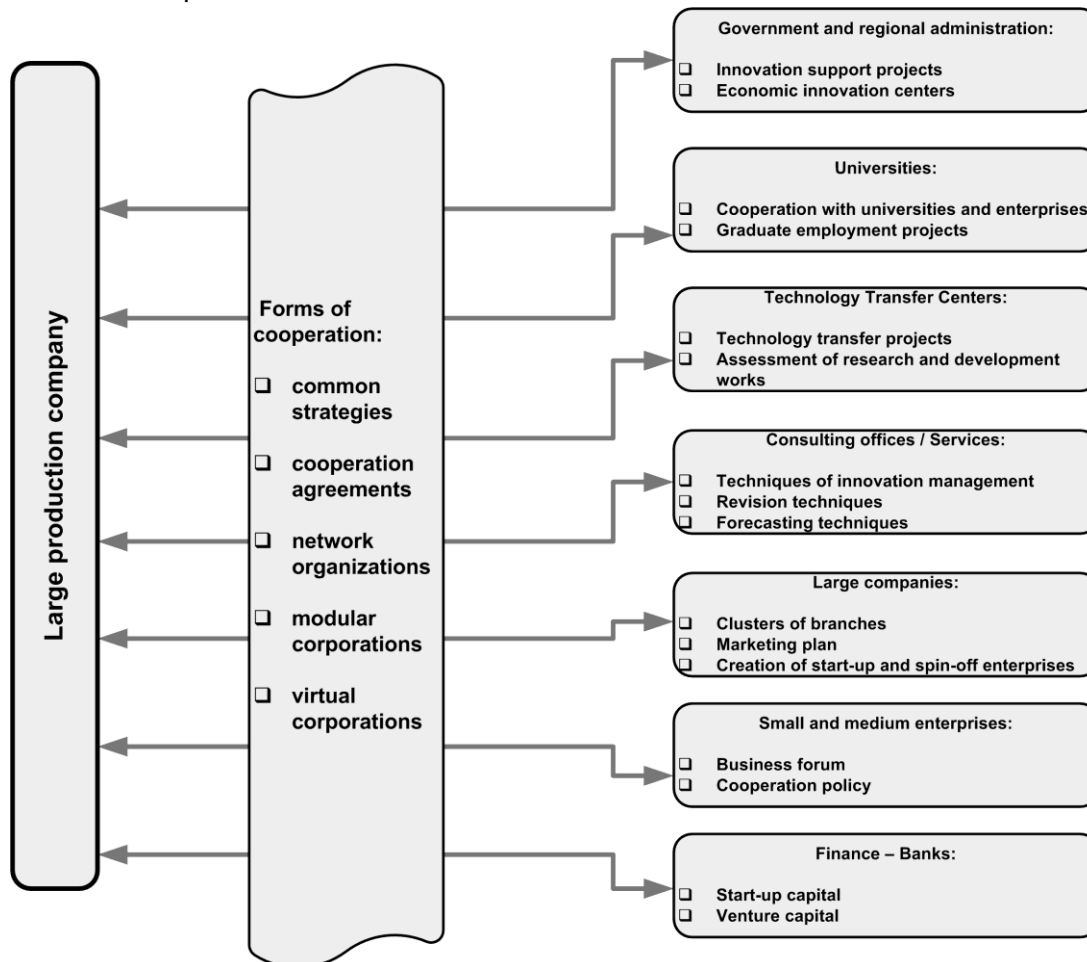


Fig. 1. Cooperation Network

Source: own study

The basis for the creation and prevalence of new forms of cooperating organizations are the growing structural transformations of industry and the entire economy. They lead to a growing diversity of products and services, which increases the absorbency of industry and the economy for innovation and promotes the development of information technologies. Other new technologies, including materials science and biotechnology, are other innovative components that are transforming the modern economy (Drljača, 2019; Gliń, 2018; Saniuk and Saniuk, 2018; Stacho et al., 2019).

2. METHODS

Fierce competition in the global economy has become the driving force behind the development of new forms of cooperation between research institutes and industry. In addition, public authorities are increasingly involved in this process, mainly at local and regional level. The cooperation of industry with research centers concerns con-

ducting joint research and development activities, as well as organizing new fields of study and forms of education (however, this practice is more often used e.g. in the United States of America and more developed Western European countries). Commercial companies, mainly large enterprises and transnational concerns, are putting pressure on universities to create programs dedicated to specific business needs. As a result of this relationship - as practice shows - enterprises build their competitive advantage, which is particularly visible in the area of new (advanced) technologies, technical and organizational innovations.

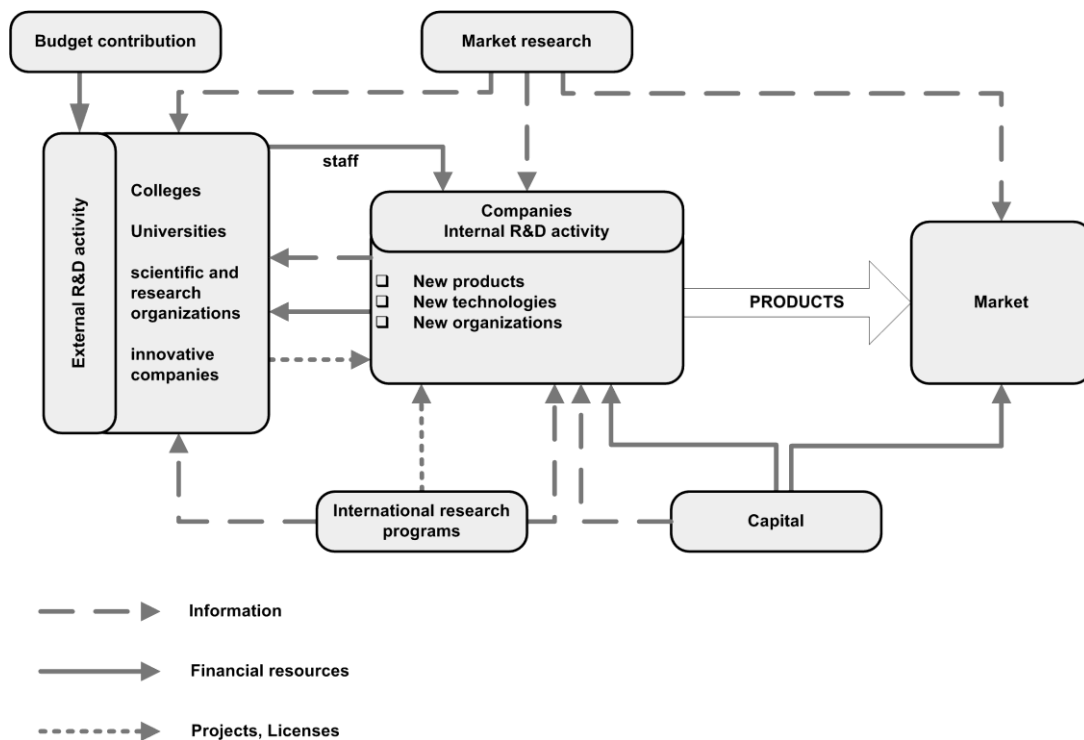


Fig. 2. Linking the R&D sphere with production enterprises

Source: own study

The diffusion of the R&D sphere and the sphere of production is demonstrated by the flow of accumulated knowledge and information and the flow of funds enabling the application of scientific research results in economic practice (Karpisz et al., 2019). Figure 2 illustrates the relationships of a large enterprise with its own R&D department and additionally using external services of domestic and foreign research units. The highest level of integration of R&D activity and production is observed in innovative companies belonging to the high-tech sectors and located in niches of the global market, mainly due to the high degree of specialization.

3. RESULTS

An example of the creation of a transnational cooperation network connecting the R&D sector with the industrial sector was the project entitled 3DCentral - Catalyzing Smart Engineering and Rapid Prototyping (No CE634).

The main assumption of the 3DCentral project, financed by the Interreg CE program, was to create a cooperation network of innovation regions operating in the field of intelligent engineering technologies and rapid prototyping through the so-called Central Europe Knowledge Axes (KACE - Knowledge Axes Central Europe).

The project built a platform for the exchange of knowledge and experience between scientific and research centers and industrial centers in the field of intelligent engineering and rapid prototyping. Actions to strengthen the links between participants in innovation systems (through transnational cooperation), leading to an increase in the innovation potential of Central European regions (Karpisz et al., 2019) (Kielbus and Karpisz, 2019) were taken. As part of the project, activities were undertaken to create a specialized education support program in the areas of knowledge management, innovation management and innovation transfer, as well as collecting and disseminating good practices related to rapid prototyping and intelligent engineering. The idea behind the 3DCentral concept was to identify opportunities that could be passed on through later pilot actions as a follow-up to the next project.

The main effects of work on the project were the initiation of 11 flagship projects and 22 international transfer and cooperation activities that were carried out after the project was completed (Fig. 3). Flagship projects as well as transfer and cooperation activities directly served the overall purpose of the project, which is to connect innovation islands related to intelligent engineering and rapid prototyping in Central Europe.

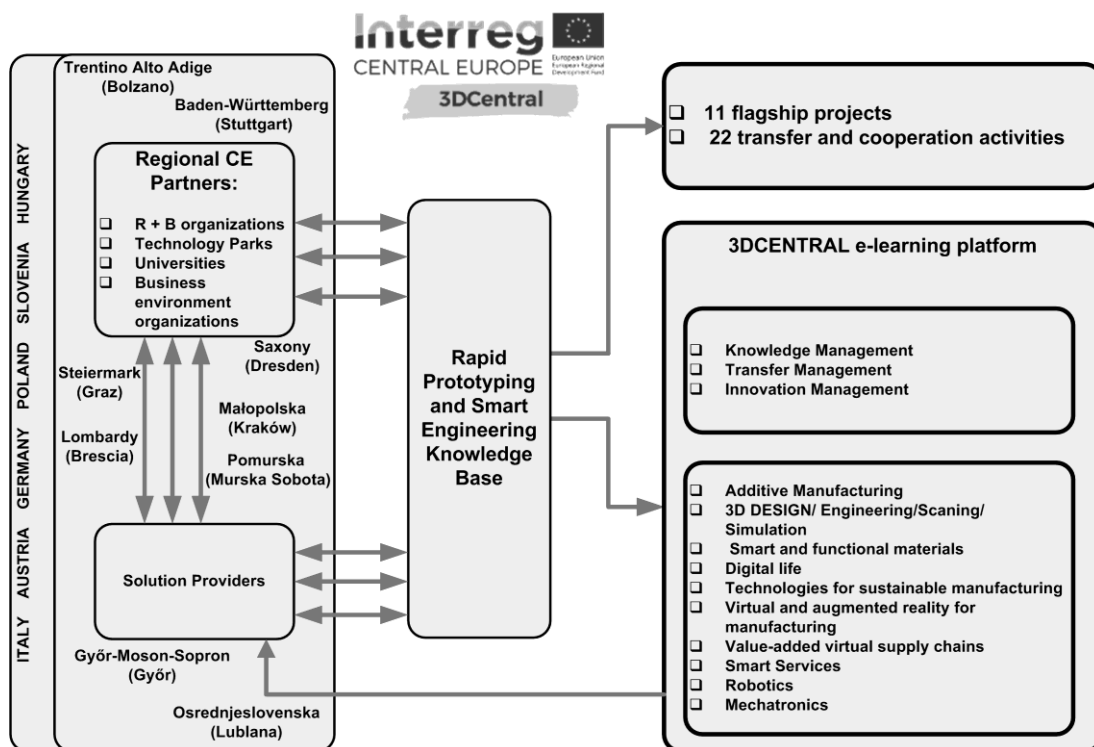


Fig. 3. The 3DCentral project in an international environment

Source: own study

4. SUMMARY

The use of new technologies enables enterprises to respond flexibly to changes in the environment in which they conduct business. In turn, the increase in the importance of information and knowledge (and their absorption) is the driving force behind the development of cooperation agreements between enterprises and scientific institutions, in particular R&D units.

In the modern production system, which absorbs knowledge intensively, the economic surplus is generated thanks to cooperation processes, which usually takes the form of

economic networks. Network organizations are quickly becoming forms of cooperation that are assimilated by enterprises. Because of their usefulness in capturing complex interactions, networks are a promising tool for describing, explaining and managing regional and ecological-regional systems.

In the modern world, the factors that make organizations more competitive are knowledge and innovation (Boratyńska-Sala and Woźniak, 2018; Woźniak and Boratyńska-Sala, 2018). Knowledge, however, is not a static, unchanging resource. Dynamic changes in the organization's environment make it necessary to increase and direct the development of knowledge resources in the organization.

Also outside the organization are processes related to learning and diffusion of knowledge (Boratyńska-Sala and Woźniak, 2018). Outside the organization there are processes related to learning and diffusion of knowledge (Boratyńska-Sala and Woźniak, 2018).

Knowledge is becoming more and more detailed, specialist, but also available, even globally. It is a dynamic factor in the outside organization's environment, but also its a dynamic resource inside. It should be remembered that R&D commercialization projects, especially transnational ones, are subject to a significantly higher level of risk than projects from other areas (Pietras, 2015). Hence, it is worth paying attention to leaving more reserve for preventive and reactive measures when preparing detailed project plans (and in particular budgets) when risks cannot be avoided. Therefore, risk management (Pietras, 2015) includes activities such as: recognition of a potential threat, assessment of its effects, determination of actions to minimize risk and re-assessment of events that may have an adverse effect on the investment.

The issues mentioned above are of the great interest in technological researches requiring huge financial support often collected from many countries e.g. "green technology" of fuel cells (Włodarczyk et al., 2011), power plants infrastructure (Osocha, 2018), biotechnology industry (Skrzypczak-Pietraszek, 2016; Skrzypczak-Pietraszek et al., 2017; Skrzypczak-Pietraszek, 2018) or surgical implants (Pawlowska et al., 2017). It may be also very important in those industrial branches where internal multinational cooperation is natural behavior e.g. steelworks (Ulewicz et al., 2013; Ulewicz et al., 2014), woodwork industry (Ulewicz, 2016), heavy-duty machines design (Domagala, 2013; Domagala et al., 2018a, Domagala et al., 2018b), production (Kozien and Kozien, 2016; Kozien and Kozien, 2017), control (Filo, 2013; Filo, 2015) and minatenance (Domagala and Momeni, 2017; Fabis-Domagala, 2013; Fabis-Domagala and Domagala, 2017).

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