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**Plug and play firms in the TNCs' virtual value chain**

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**Abstract**

Growing virtualisation of the value chain appears to be an expression of implementation of ICT solutions in international business represented by TNCs. This creates new opportunities for cooperation within the value chain and its composition. The growing importance in this area can be attributed to companies integrating the value chain, known as plug and play. Their integration into the value creation chain gives a new dimension to TNCs' strategic choices from the fragmentation of activity and its integration on an international scale point of view.

**Keywords:** TNC, plug and play companies, virtualisation, value chain, digitisation.

**JEL Classification:** F2, F6, M1, O3.

**Introduction**

Computerisation and informatisation of various fields of economy and society have significantly changed the conditions of the business' functioning in recent years. Companies are no longer viewed as single entities, but as a part of an integrated network of organisations, where information and communication environment plays a key role.

The growing virtualisation of a value chain is a manifestation of the implementation of ICT solutions in international business represented by TNCs. This creates new possibilities for enterprises to enter the value creation chain [Porter 1985, pp. 33-61]. Companies integrating the value chain, known as plug and play, are a reflection of this. Although a growing number of researchers are interested in virtualisation of economic activity, its analysis from the perspective

of units integrating a value chain, i.e. plug and play, is not widespread, especially in Polish literature. An article is thus an attempt to present a new approach to value chain virtualisation – through the prism of its new integrators and connections. Given the above considerations, the objective of the study is to identify the role of plug and play firms in the transnational corporations' virtual value chain and their influence on the TNC's strategic decisions within the framework of value creation by the chain's new units.

The undertaken issues have a general character, systemising the research area and in no way deal with all its aspects. It is the introduction to the discussion on the role of plug and play companies in the TNC's value chain, focused on creating competitive advantage in the conditions of activities' fragmentation and its integration in the international scale.

The study involves a deepened literature analysis, basing the conducted research on the genetic method used for explaining the reasons of a studied phenomenon within the range of economic activity digitisation and value's creation chain virtualisation combined with literature analysis systemising theoretical approach to the discussed problematics. The analysis was based on foreign sources and to the smaller degree on Polish ones (due to their limited character).

## **1. Digitisation of the economy – implications for international business**

### **1.1. Digitisation of the economy – conditions, symptoms**

The information revolution entails a number of consequences that create a specific environment for the growth of the New Economy, involving the creation of knowledge, innovation and creativity and the use of information technology for the development and sales of new products and services. Physical distance is no longer as important as in the era before the IT revolution and the death of time leads to the emergence of new market segments. This creates new opportunities for development of trade and distribution of products through the digitisation of products and the development of the service sphere.

The turn of the XX and XXI century witnessed a massive development of self-organising techno-human networks due to information technology popularisation. Thanks to the Internet a user has an access to a complex infrastructure that enables him the so-called "cloud computing", i.e. using the network without the knowledge about the necessary technology [Kotler & Caslione 2009, p. 34]. With this type of networks, companies can reach the customer regardless of his place of residence, meet his needs and enable him to actively participate in the

co-creation of the final product. At the same time there is a growing pressure from the client, who wants to have easy-to-use applications that allow them to compare the products' characteristics, their prices, transactions' execution and distribution. As a result companies operating on the international level, need to handle the following problems:

- increased price competition,
- the need to adapt to international standards in terms of the presentation of products, forms of payment (e-payment), distribution, after-sales service, etc. In this way another competitor has emerged – providers of applications enabling implementation of new solutions (B2B) [Hirt & Willmott 2014, p. 2].

These processes constitute the digitisation of the economy, which is usually understood in the context of the development and the increasing use of information and communication technologies in business and its relationships with stakeholders from both closer and further environment, which undoubtedly translates into ways of doing business, type of connections and consequently, conditions for competition. In short, digitisation is the result of the implementation of ICT solutions, especially the Internet and its potential concentrated in three areas: communication (transfer of information), resources (data storage) and social (network creation and cooperation) [Ruiz et al. 2011, p. 6].

The progressive digitisation of the economy is accompanied by:

- increased number of web-native products. These include new generations of products and services that do not have equivalents in reality (e.g. an electronic ticket), and that can be distributed throughout the world;
- reorganisation of the enterprises in order to better exploit the achievements of the digital economy, new and more effective use of IT technology;
- reversed distribution of the benefits of globalisation – emerging markets invest very much in the development of the digital economy, which could translate, in the long run, into greater benefits from the digitisation of the economy in relation to highly developed countries.

## **1.2. Digitisation – a new dimension of market space**

Digitisation is driving the expansion of traditional market space, creating the possibility of perceiving it through the prism of:

- Information. The virtual space of information gives an opportunity for the presentation of product information in real time and in an appropriate manner, generally easier for the customer than traditionally.

- Transaction. Internet “slims” the whole process of transaction between a buyer and a seller, increases the efficiency of the transaction and can reduce its costs and time of its execution, e.g. by reducing the traditional administrative tasks.
- Distribution, communication and product digitisation. Virtual space of distribution brings new opportunities for creative business models and facilitates access to foreign markets. Companies offering digital products and using the Internet as a marketing and distribution channel offer customers a more convenient form of distribution, providing immediate delivery at a lower cost (skipping intermediaries).

The basic impact of new technologies on business development is expressed not only in new distribution channels and product’s marketing and markets, but also in new products [Chen 2005, p. 17]. As argued by N. Gershenfeld, professor at the Massachusetts Institute of Technology, development of computer technologies, materials’ science and nanotechnology leads to the production personalisation and allows the blurring of the boundaries between the world of intangible ideas and material production, which puts the challenges to science in terms of the development of a new general theory of production [Bendyk 2007, p. 48]. An example in this regard are, operating in many regions of the world, Fab Labs, i.e. small manufacturing enterprises (mini factories), whose instruction of “assembling” can be purchased on the Internet. In exchange for the risk of starting economic activity based on project purchased in the network, entrepreneurial consumer has an active impact on the product, which he can modify and customise according to the needs.

The importance of digitisation in the economy was confirmed by studies carried out in 2014 by McKinsey among managers of companies gathered in DMDII (Digital Manufacturing and Design Innovation Institute, which brings together more than 200 organisations, including those from industry and academia). Over 80% of respondents believe the digitisation of production to be a critical factor of competitiveness [Nanry, Narayanan & Rassey 2015, p. 2].

## **2. Plug and Play companies in TNCs’ virtual value chain**

### **2.1. TNCs’ business network – focus on virtualisation of value chain**

The contemporary nature of the economy makes every business, whether it wants or not, to operate in the network [Rosińska-Bukowska 2012, pp. 143-213]. In the literature on the subject one encounters many similar-sounding terms like network of enterprises, network enterprise and e-business. In the case of network of enterprises, network is regarded as a way of coordinating the actions of many

businesses, through various ties – technical, planning, social, economic, legal, etc. On the other hand the network enterprise is a network that should be treated as one company with high flexibility [Pierścionek 2011, pp. 397-398]. It is often equated with a virtual organisation, which also is not always defined explicitly. The concept of virtual organisation, as perceived through the prism of the enterprise for which the key is not the ownership of the processes, but control over their effects, is connected with no specific place of activity, i.e. not linking the implementation of its processes with a particular place and time [Hatch 2002, p. 195, after Wielki 2012, pp. 50-53]. One mentions also the following aspects: 1) organisational aspect of enterprise's virtualisation, emphasising the role of information technology and global network in the establishment and functioning of the company and the opportunities arising for the company from their development, 2) the physical aspect, identified with the increasingly common replacement of tangible elements of companies with intangible ones (digital information).

Regardless of the differences in the definitions, the main problem for the company is to find the way of obtaining such resources and characteristics of competitiveness that will ensure its success in the competitive struggle. It is also the ability to find partners that corresponds with business objectives and building the desired short and long-term relationships with them. It may be relationships of companies with market participants, such as suppliers, customers, new players outside the industry, with who companies want to start cooperation or are their competition, or with contextual entities (e.g. authorities, banks, universities). In the New Economy the most important changes concern ways of creating a relationship with the client.

Although TNC is a single legal and organisational unit, it operationally consists of several subsidiaries. Each subsidiary is rooted in its network of business relationships, which to some extent is different from the networks of other subsidiaries of the corporation [Zorska 2007]. Computerisation together with the resources of corporate knowledge constituting in the micro scale the basic criterion of virtuality [Perechuda 2013, p. 226; Christopher & Towill 2000] covers with its impact the increasing number of functions exercised by individual members of the network (initially focused on dealing with customers and marketing). This means both the progressive virtualisation of TNC's value chain, defined as a dynamic process, omnidirectional and non-linear, co-created by TNC on the basis of different kinds of relationships with cooperating suppliers, customers, business partners, in which the Internet (ICT solutions) is used in the process of value creation and on which it has a strong influence [Wielki 2012, pp. 83-87]. This is facilitated by the growing commercialisation of information, while maintaining at this stage the dual nature of implemented functions, i.e. traditionally

and on-line, as well as composing new value chains based on specific abilities of individual business units and mechanism of relational rent built in an interactive, stimulated environment – virtual worlds – created for many participants.

## **2.2. Development of plug and play models – option for chain integration**

With the development of ICT, grows the importance of enterprises engaging in projects that integrate the activities of enterprises dispersed in the network. Fragmentation creates a kind of space for new companies integrating this chain – plug and play models [Hirt & Willmott 2014, p. 5]. More and more international corporations include the existing market offers, often of small enterprises, in their value chains, thereby creating integrated packages of services for the customer (e.g. touring – hotel, flight, car rental, on-line payment) [Poniatowska-Jaksch & Pakulska 2015, p. 27]. Companies implementing plug and play models are often start-ups of born global type (they have derived a competitive advantage from the use of resources and sales of products in many countries since the moment of their creation).

The nature of resources of plug and play companies affects the separation of preformed value chains, thereby creating room for new, nimble competitors, who are able to adapt to changing conditions. These may be companies already operating in the market, but in a different role – taking a new activity. Good examples of it are, among others, providers of services related to telecommunications, or insurance who can enter completely new markets without having to build a distribution network or to acquire additional local agents. They may also use customer databases that are in their possession. New players include often also small enterprises, which rapidly increase the scale of their operations at lower costs than already operating companies on the market.

In the long term leaders increase the scale of operations utilising the talent and intellectual property, which in intensity-information models mostly impacts the success. These characteristics are also a part of successful start-ups, where engineering of knowledge and high culture drive favourable development cycle. Digitisation more often and more deeply enters the fields related to knowledge, which requires from employees increasingly higher qualifications and new skills (e.g. the developers of artificial intelligence), i.e. the talent needed for the development of digital businesses and their entry into the global structures.

Moving away from the traditional perception of the value chain into a new one, with growing importance of virtualisation, corresponds to a different customer perception than ever before. Digital technologies know no borders, and the experience coming from the needs of the individual customer may turn into

an international standard offering. On the B2B market, corporate buyers are putting pressure on suppliers to standardise services in the international dimension, which leads to a better match of the product offer to customers' needs. The importance of business models that create value for the customer from a combination of different spheres of economic activity (e.g. production of cars with automatics and production of new materials) grows.

Effective global management of relationships with suppliers appears to be a factor integrating the process of value creation, especially in the context of digitisation of the economy. They are a part of global information systems, which ensures deliveries by integrating enterprise's information systems and data obtained from external suppliers. Williams, Espaer and Ozmet also pay attention to a supply chain as an integrating factor, especially of virtual enterprises [2002, p. 705]. According to these authors, e-supply chain is a group of interconnected companies – within the organisation and among themselves over an information network that is used in the process of flow of materials, information and funds. Electronic supply chain is a new form of cooperation of companies, which allows the organisations forming this group a joint designing and development of products, participation in forecasting of demand, flexible use of available resources and better adaptation to customers' needs.

### **3. New dimension of TNCs' strategic decisions in the context of the fragmentation of activity and its integration**

In conditions of turbulence and hypercompetiton (high dynamics of changes in the environment, competitors coming out of nowhere in the light of the growing digitisation, etc.) and significant correlation between organisational structure and implemented strategy, functional and spatial fragmentation of the value chain creation can be perceived as a strategic decision.

With regard to transnational corporations this decision entails a number of consequences like the methods of development, the degree and scope of use of its own and external (shared with other organisations) resources, the selection of strategic partners and the nature of formalising this cooperation, or the degree of discounting integration competences in accordance with the changing stakeholder's expectations.

In the context of the progressive functional and spatial fragmentation of the value chain, building cooperative global networks and providing them high flexibility and greater efficiency than ever before seems to be a big challenge for companies operating in the international dimension [Małys 2013, p. 183; Po-

niatowska-Jaksch & Pakulska 2015, pp. 67-68]. Flexibility as the ability to adapt to change, enables organisations the development through anticipation of changes in the environment and their use as potential opportunities (opportunities creating occasions for gaining benefits, for example market niche, business offerings integrating chain) and adaptation to unforeseeable changes [Krupski 2009, p. 22]. The flexibility of an organisation can manifest itself at different levels, i.e. the resources, the production unit, the facility, or functions levels, carried out through inclusion of companies acting as integrators of value chain controlled by TNC, as well as relating to the undertaken cooperation in the field of business deals offered by plug and play companies.

TNC, as a flexible organisation, conducts orchestration of spatially diversified activities covering the whole TNC's value chain [Porter 2006, p. 61; Obój 2007, pp. 361-362], decides on the distribution of each of its fragments, analysing risk of investment's location. This results in a fact that the distribution of the individual pieces of business requires taking into account various factors that give rise to different levels of location risk, which is one of the reasons of its high complexity at the level of the central unit [Pakulska 2014, p. 109]. The aim of the fragmentation of production is an optimum use of the location advantage of the various stages of production, while a side effect – the costs associated with their combining through activities having often the nature of offering services (e.g. transport, coordination and management).

Considering the above conditions, growth strategy at the corporate level implies answering a question whether it will be focused on a single business (strictly defined specialisation), or on several (it will be diversified) and what will the trends, scope and nature of the growth and development of the company be? One of the most important decisions is to determine whether the company will use the internal growth (own investments extending the potential), external (cooperation with other organisations of various kinds of links, i.e. ownership, capital), or mixed.

Given the fact that in the conditions of modern “winner takes all” competition and a strong computerisation, transnational corporations rely on growth, where the large role is played by the properly chosen methods of implementation of the strategy, taking into account mixed methods of growth that can be used with varying frequency and scope at the level of individual business units. Focusing on the digitisation and “customer related obsession” creates special conditions for the development of plug and play enterprises, including business package offers for the customer created on the basis of TNC's activity.

One cannot forget also about the fact that in conditions of information revolution strategic decisions in the area of functional and spatial fragmentation get

additionally complicated. Key among them is the issue of lifting digital competences to a higher level, which in an era of rapid changes is difficult and requires a good and varied instrumentation at the level of individual entities, but also the entire value chain and its coordinator.

## **Conclusions**

Digitisation and networking of economies have become the ground of growing virtualisation of the value chain. In the conditions of the growing fragmentation of the functional and spatial activities of the TNCs, and as a consequence of virtualisation, TNCs create smoothly integrated value chains connecting the sources of supply with customers. Plug and play companies that integrate the value chains, generate a new value for the customer.

At the level of practically every element forming a value chain, it is possible to take action on the one hand introducing new business modules (strictly based on the Internet, networking), and on the other hand eliminating the traditional modules, connected with the so-called before-Internet economy and physical shortening of the value chain in a dynamic market environment without borders.

The acceleration of growth and the strengthening of development potential are associated with it by corporations. This does not change the fact that decisions on directions, forms, or the scope of this cooperation, also concerning the value chain integrators – plug and play companies, gain strategic importance for TNCs. At the current stage of development, they are a part of an approach based on mixed methods of corporate growth strategies.

Due to its character and growth determinants, the undertaken problematics is a part of many research trends investigating complex organisations, like TNC in the economy digitisation conditions. These trends include: 1) new strategic thinking (referring to greater organisation's internal and external resources involvement), flexible strategies (ability to adjust to changes) and related corporate business (the use of occasions in the internationalisation process and abilities of adjusting to the changing conditions), 3) network theory, especially strategic business network (network leader imposes strategy and coordinates flow of resource, information and knowledge within a network), classical and network internationalisation theories, modified along with changing internal and external actions' conditions, 5) cooperation strategy, including globally cooperating organisation (actions aimed at providing clients with complex products and services), 6) integrated management (enables global value chain management, which involves various entities, with diverse connections, without excluding new value chain integrators).

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