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TRANSNATIONAL CORPORATIONS
AS CHAIN LINKS IN THE INTERNATIONAL TRANSFER OF INNOVATION AND KNOWLEDGE

Summary: The article attempts to show that contemporary transnational corporations (TNCs) play a key role not only in the traditional transfer of innovative solutions, but are also centres that constantly generate new streams of knowledge, and which therefore are key links of the international chain of creative innovation. This article consists of three parts. The first presents the evolution of the notion of innovation. The second attempts to identify the basis of the recognition of transnational corporations as key links of the international chain of creative innovation. The final chapter presents examples of business models of selected corporations (Apple, Toyota Motor and General Electric).

Keywords: transnational corporations, TNC, innovations, knowledge transfer, business models, Apple, Toyota, General Electric.

Introduction

The generation of new ideas and knowledge is the greatest asset in today’s economy. It is the source of economic development, science, and innovation – without it, individuals and societies would succumb to stagnation. Corporation careers require both: creativity and innovation. Creativity and innovation are tools that can be developed and fostered. Through exploration, observation, and imagination corporations are challenged to react with vision, think outside the box, and to produce creatively. This article attempts to show that contemporary transnational corporations play a key role not only in the traditional transfer of innovative solutions, but that they are centers that constantly generate new streams of knowledge, and, therefore, they are key links in the international chain of creative innovation. The article presents the evolution of the notion of innovation. The presented waves are the next stages of the globalization of innovation leading
Transnational corporations as chain links in the international transfer of innovation

1. The evolution of perceiving the concept of innovation in the times of a knowledge-based economy

Innovation and innovativeness are terms that are currently used in almost all areas of socio-economic life. The evolution of the global economy, in fact was contributed to its transformation into a knowledge based economy, characterized by the continuous growing demand for new technological and organizational solutions. Innovation defined as a combination of learning with the ability to implement research results is one of the major developmental challenges in the era of globalization. Bodies which are able to meet this challenge and generate new streams of “useful” knowledge gain a key role in the international chain of innovation (this applies to countries and companies).

It should be noted that the concept of innovation is not a new one. J. Schumpeter is widely recognized as the founder of the theory of innovation; he stated that innovation is the engine of enterprise and it is a much more important determinant of economic development than capital. According to him, the innovation process consists of: the introduction of new products or components of the production process and improving existing ones; implementation of a new way of sale or purchase; and, finally, the change of the rules of the organization of production. What followed in the course of global economic development was the paradigm shift of innovation and the associated evolution of innovative models. One can extract five waves of innovation [Pangsy-Kania 2012, pp. 111–112]: the first wave (beginning of the twentieth century) – J. Schumpeter’s innovation theory; the second wave (1950–1960) – technological innovation based on its design, that is, innovations in products and processes; the third wave (1970–1980) – with a massive innovation in specific areas of business (mainly industry); the fourth wave (the 1990s) – a system based on an integrated innovation model; the fifth wave (the beginning of the XXI century) – innovation related to knowledge, whose essence is the creation of added value.

The presented waves are the next stages of the globalization of innovation leading to the knowledge-based innovation model and thus the crystallization of a model of the knowledge-based economy. The first breakthrough was the shift from the linear model (Schumpeter model) to the integrated model (systemic model). This meant the parallel processes of creation and the implementation of innovation, which is necessary for research and application system based solutions in the development cycle. The requirements are, among others: integration of R&D and production and service, and creating task groups. As a consequence, it is followed by the growing importance of links with suppliers, subcontractors,
customers, and designers with focus on real opportunities to produce and sell, that is, the creation of an integrated value chain link. Another breakthrough is the transition from the integrated model to an innovative multi-level network. The popularity and promotion of the model is the result of the development of computer technology (especially the Internet) and thus accelerating the flow of information relating to technological, organizational (organization and management methods), and marketing (promotion, distribution) innovations. The concept is of paramount importance to create value added to the previously known standard, the use of multiculturalism and so-called “local” diversity (geographic, industrial) in order to gain a competitive advantage in the global market.

The overall conclusion is that as a consequences of change in the global economy it is necessary to have a somewhat broader view of the concept of “innovation” and “innovativeness” taking into account the internationalization of the creative innovation chain. Today, innovation-related knowledge, generating added value, requires a constant adaptation to the requirements of the dynamic international environment.

“Innovation” should be understood as the ability to use research results, concepts or inventions and the willingness to seek them due to the process of the continuous and rapid imitation of innovation [Dominiak 2009, pp. 187]. It requires not only the activity of pure scientific research, but an appropriate “framing system”, which means the need to combine the creative innovation (ideas, inventions, ideas) of the diffusion process to real applications in specific areas of socio-economic development. In this sense, “innovation” must combine dimensions: research (technological), organizational (business) and financial (input – the results).

“Innovation” is to be understood as pioneering new technologies, institutions or the organization, that is, the first use of technology / knowledge, which resulted in success. One can distinguish [Pangsy-Kania 2012, pp. 109–112]:
- subject based – introducing new goods and services to better meet their responsibility in exchange for those previously used,
- functional – satisfying the new, not yet disclosed to social needs,
- process- and organizational – for new production methods, which make production more efficient (cheaper, more efficient) and more socially responsible (green, acceptable by the local community, using methods of improving the quality of working conditions and the operation of the environment)

Different types of innovation can occur simultaneously or independently. As a result of the uneven spread of innovation, there are technology gaps, whose reduction is down to the skilful combination of sources of innovation within individual organizations (states, sectors, groups, business networks). Increasing the innovation of the entity is thus an appropriate recombination of the value chain in the organization and benefiting from the added value created as a result of using

1 The author discusses process and organizational innovation separately.
different sources of innovation: its own research capacity (expenditure on R&D, patents), imported technical ideas (e.g. purchase licensing, technology) and international cooperation (e.g. in order to gain know-how or a brand). The ability to conduct multi-level cooperation is crucial in a knowledge-based economy. As per the existence of entities capable of meeting these challenges basing their strength on the ability to act in such conditions, one can witness the emergence of transnational corporations.

2. Transnational companies as chain links in the international creation of innovation

At the beginning of this discussion the author attempted to draw attention to the distinguishing features of transnational corporations in relation to traditional, monolithic companies\(^2\) that decide that TNCs are leading economic change, tearing down barriers in international trade and have the ability to depart from any crisis even more powerful [Boruc & Remisiewicz 1999, p. 62]. The author decided to identify those attributes and emphasize that among the corporations themselves one must also distinguish objects that are the nodal points of the global economic space – the most powerful corporations, which are orchestrators of the Global Business Network (GBN). Orchestrators are a group of TNCs classified into the small group of industry leaders in global oligopolies. They have adequate capital, a stable market position and maintain their own strategic policies in order to gain independence from institutional and axiological factors [Rosińska-Bukowska 2012, pp. 201–202]. Corporations are orchestrators that stand out from other TNCs in their development approach, which reflects their business models.

Generally, transnational corporations are seen as entities managing globally organized production and service networks, and controlling large areas of the economy through capital commitment. They build their power on innovative actions, understood as smooth adaptation to dynamically changing conditions of development. They modify their functioning and structure in order to benefit from differences in the distribution of production factors (natural resources, capital, labour) and the specificity of national policies [Rosińska-Bukowska 2009, p. 112]. The key to distinguish corporations from traditional, monolithic companies is emphasizing the importance of their philosophy (culture) on the effectiveness of the multi-level system which determines the cooperativeness of its constituent component units. Based on the analysis of various definitions and classifications [Zorska 1998, pp. 50–57; 2007, pp. 126–132; Nowakowski 2000, pp. 245–248]

\(^2\) It should be emphasized that this does not mean that TNCs are not enterprises, but only aims at emphasizing their value.
the key attributes of TNCs are: global efficiency, geographic dispersion, arbitrage, organizational complexity, the need for specialization, integration, intra-organizational transfer of knowledge, networking, flexibility and sovereignty. It is important that one does not decide about the “dissimilarity” and the specificity and strength of the corporation. The distinctive feature of TNCs is that one can and even should present them as a system of “connected vessels”.

The foundations of the system are the processes and structures that are supported on four pillars: the ability to arbitrate, key competences (specialization), the diversity of organizational forms depending on the circumstances of the multicultural, global environment and preserving the sovereignty decisions while meeting the diverse demands of various stakeholder groups. This model provides flexibility and an overall organizational effectiveness. The global spread should be viewed as the sine qua non for defining the entity as a corporation. The aforementioned characteristics of the attributes that make up corporations may also occur in other entities. The strength of the corporation results from the fact that they overlap, that is, their synergies actuate streams of innovation. A systematic expanding multi-level system of corporate links constantly generates successive pulses to stimulate product innovation, function, process and organization. Corporations – GBN orchestrators are the centre for innovation, not only because it is based on their own potential, but it is reinforced by ideas and initiatives imported from network members and partners and affiliates. As a result, they naturally become nodal points of the international chain of innovative actions, competence centres, and/or R&D bases for global impact.

It should be noted that certain actions of the corporations and their characteristics result from their level of international engagement, which is the basis for the categorization of participants operating in the global range. On theoretical grounds one can refer to the concept of C.K. Prahalad and Y.L. Doz [1987], developed by Ch.A. Bartlett and S. Ghoshal [1991]. On the basis of their willingness to be amenable to local sensitivity (differentiation) and/or global integration (standardization) one can identify four types of corporations: multinational, international, global and transnational, that exhibit a specific capacity for the creation and promotion of innovation. With the development of a corporation, one observes a shift to a higher level of involvement in the global space of business through a change of the parameters considered strategic within the competitive strategy. In mature global network organizations (type GBN) innovation usually assumes the nature of organizational processing; product and function innovation occurs as an addition. This is a transition of the parent corporation from the dominant role, the central body, to functioning creatively as the orchestrator of a multi-level, global business network. This approach is part of an evolutionary model of TNC [Westney & Zaheer, 2001, pp. 349–379], according to which internal factors (adaptability of the organization) and external (to benefit from the international environment), determine the competitiveness and therefore the innovative ability of the subject entity.
In this way, once again, there are clearly issues of adaptability, that is, the attitudes towards cooperation, or coalition-building as an important factor in the conversion of challenges flowing from the vicinity of the strengths of the company different types of innovation. The attributes of transnational corporations indicate possible areas of their advantages as well as their appreciation of the important parameters of the development of such features as: collaboration, creativity and innovation. Consequently, the skilful use of the knowledge-based economy by corporations allows them to constantly generate new streams of knowledge, permitting them to be key cells in the international chain of creative innovation.

3. The place of innovation in business models of selected corporations

In the last part of this paper the author will attempt to demonstrate that innovation and knowledge creation are important elements of the development strategies of leading multinational corporations. The author discusses the business models of Apple, General Electric, and Toyota Motors, trying to verify to what extent the strengthening of their position is due to their ability of meeting the requirements of the knowledge based economy. The selection of these very subjects was dictated by their consistently high ranking position in the classification of the most powerful corporations, among others, the most admired corporations, with the Most Valuable Global Brands and in the most innovative companies.

Reference to the Most Admired Companies\(^3\) list was considered appropriate because of the many aspects of the ongoing research. The overall assessment ratio is based on eight parameters: innovation of the company (number of patents and deployments, employment in R&D, pro-development expenditures); use of corporate assets, especially human resources (talents of employees); Corporate Social Responsibility (CSR) e.g.: its attitude to environmental protection; transparency in governance; respect for human rights; assessment model of governance; investment policy; financial condition and quality of the offer. The statement published covering the years 2006–2007 shows that GE was the highest rating company (in 2012 only at rank 15); however, since 2008, Apple holds the leader’s position (ranked 11 in 2006). General Electric continually (2006–2012) occupies the position of leader in the electronics sector (other listed companies include Samsung, Siemens, Sony). Apple is the leader (in 2006, ranked 2) in the computer corporations (other listed companies include EMC, Xerox, Dell, Canon, HP). Toyota is not the leader of the ranking of the automobile sector (ranked 1 in 2006\(^4\), now only 33), but it is, in turn, 

\(^3\) Annually done by “Fortune” since 2006.

\(^4\) In the period between 2007–2011, BMW ranked as 1. In 2012, however, the highest development model went to Volkswagen. Daimler was ranked 2, while BMW dropped to third place.
the most valuable brand in the industry. The example of Toyota is to emphasize that modern leaders must continuously improve their business models and adapt them to the changing environmental conditions, in order to effectively fight for their position in the market [The 50 World’s Most Admired Companies 2006–2011].

The need for a new look at the determinants of development under new conditions is primarily to highlight the role of qualitative factors in building a competitive advantage. One form of quantification of this type seems to be the value of assets held by the company brand / brands. Reviewing of the Most Valuable Global Brands ranking [Top 100 Brandz 2000–2011] indicates that all the corporations surveyed consistently remain front runners. Apple is in 8th place and systematically increases its rank (in 2010, ranked 17). Toyota ranks 11, holding the industry leader rank from 2006.

The reference to the ranking of The Most Innovative Corporation only as the third reference was to emphasize that the innovators really are the leaders; that they are not companies that, just thanks to one invention, have been included in this list. In addition, the author notes that this is not always synonymous with the highest expenditure on R&D (both in terms of the sums expended, as well as a percentage of the value of sales). This may suggest that it is not about typical inventions – product innovation, but a new kind of approach to business (functional or process-innovation and organizational). Most money spent on innovation comes from companies in the medical and pharmaceutical industries. However, the leader of the ranking of the most innovative corporation is Apple, which spends USD 1.8 million, which represents only 2.7% (compared with 21% for Rocha), of the value of its annual sales. As many as 70% of respondents put Apple in the top three most innovative companies in the world, half of which place the company as number 1. General Electric takes 4th place in the classification of the Global Innovation Index 2011 – spending USD 3.9 million, or 2.6% of sales, and Toyota is ranked 9 – spending USD 8.5 million, or 3.9% of sales [Jaruzelski, Loehr & Holman 2011, pp. 10–11].

The choice of these corporations was also justified by other considerations. Apple is a corporation which in recent years has been very successful in spite of strong pressure from their competitors. Toyota, in turn, after the huge success of being considered as a model in the field, having created a qualitative model of development, recently started to lose its leading position. Analysis of General Electric’s business model is a point of reference because of its interdisciplinary branch model and as a leader of the world’s most powerful non-financed corporations [The World Investment Report, 1991–2011]. It is also important that the mechanism of competitive

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5 For example, Roche Holding USD 9.6 billion, 21% of sales in 2010, and Pfizer, respectively USD 9.4 million, or 14%, Novartis 9.1 million, or 18%. Among these corporations at the forefront one acknowledges only Toyota – 9th place.

6 The company is consistently since 1996 (except for the years 2000–2001, rank 2), the leader of The World Investment Report. In addition, it is listed among the top most powerful financial corporations, also prepared by the UN Agenda on Trade and Development UNCTAD.
advantage, in this case, is based on adaptive changes in the system for establishing business relations and the introduction of various innovations [Rosińska-Bukowska 2011, pp. 21–33]. Each of the corporations mentioned is certainly a leader in its field, which as a result created a system of networking, with players looking for potential sources of competitive advantage. As a result, we are dealing with entities that act as GBN orchestrators. The challenge is to attempt to demonstrate that each of them not only recognize innovation as an important element of their concept of development, but also as an indispensable mechanism for the regular creation and international transfer of innovation to build an organization of a global business network. As a result, these corporations are becoming hubs of the international links of the innovation chain. The challenge is to attempt to demonstrate that each of them not only recognizes innovation as an important element of their concept of development, but as an indispensable mechanism for the regular creation and international transfer of innovation to build an organization of a global business network. As a result, these corporations are becoming hubs of the international links of the innovation chain.

Apple Inc. is currently the market leader in computers and modern multimedia solutions. An analysis of corporate history and the evolution of its offer indicates that the key to the success the company was striving to find lay in its innovative solutions. Initially focused on typical product innovations, it seems that the dynamics of growth and success of Apple were based on networking knowledge and as a result creating a set of products for different types of applications. The company quickly realized that the forging of technical ideas into concrete, targeted solutions and their speed of implementation is the basis for competing in the new conditions (especially in the electronic market)\(^7\). Business development was combined with the introduction of more products (in 2001, the iPod, in 2007, the iPhone), which answered to the challenges of development. Each of them led to the establishment of a new standard for the industry, which confirms that the corporation is not just a component of the international chain of innovation, but plays the role of a centre of competence. It seems that the name change from Apple Computer Inc. to Apple Inc. was aimed at emphasizing the transition from a monolithic entity, (the producer of computers) to the level of a network Orchestrator, a supplier of a wide range of devices and services [Annual Report Apple 2011]. The corporation is thus an almost perfect example of the development strategy of adaptation to the challenges of a changing economy.

Apple’s business model must be regarded as: innovation, global reference, focus on internal and external collaboration and brand name. The main objective of corporations is to provide the best branded products and services to consumers around the world. Globalization strengthens corporation development and, as a result, Apple is one of the most recognized brands. As drawn up by the Financial Times Top 100 BrandZ index, the company’s brand value is USD 183 million and that

\(^7\) More on Apple’s history at: Company history [2012] and S. Stodolak [2009].
is a 19% increase compared to 2011 [Top 100 BrandZ, 2012]. The greatest value seems to be worked out owing to the model of organizational culture that allows systemic innovation. This concept is based on professionalism and such a form of implementation of strategic actions that means “to relate respectfully to each other and the environment”. A key element of the model is the recognition that the interests of the mother company and its components (including employees and subcontractors) are inseparable. The development vision of building a global network of business is thus subordinate to systematic innovation, which will always allow the company to remain the best.

From the beginning the Toyota Motor business model was based on the designation of key objectives (or pillars if you may) as strategies of success and organizing all projects around them. Toyota recognized four elements: the need to build the concept of organization development in the long run (philosophy); focus on key processes and eliminating any and all losses (process); appreciating the importance of human resources and partnerships (people); and consistent improvement, including high-resolution specific problems (problem solving). The model is based on the so-called 14 principles of “Toyota ways” [Liker 2005, pp. 47–50]. It is essential to focus on a comprehensive approach to management, meaning not so much individual variations and modifications, but the look of the process and organization. An important element is to standardize the output of tasks as a basis for constant modernization and the emergence of leaders in the process, which means the establishment of competence centres for specific activities/products. The essence of the model is the recognition of culture as a kind of conveyor belt, and promoting the flow of knowledge, as a result of constant innovation and improving quality. The advantage is the relational concept of power, that is, building relationships with organizations in all groups of stakeholders. This is determined by innovation in all dimensions, since development impulses originate from customers, suppliers, and employees. Each of the participants in the system is focused on continuous improvement, requiring further changes. This is the idea of a “Toyota community” [Nowakowski 1987, pp. 42–43]. The consequence of the realization of the strategy is the creation of a multi-level, integrated system aiming at increasing efficiency by building a self-steering system, allowing for, for example, the shortening of waiting time on demand, and reducing inventory costs. The advantage therefore stems from innovation processes, organization and management. The “Toyota Production System” was used by many companies that wanted to improve their efficiency. Toyota has become a key link in the international system of innovation. The essential instruments for the creation of new solutions in an increasing number of other areas and in particular the diffusion of knowledge are: suppliers, clients, associations, departments, operations management consulting, small (problem) group learning, and training or employment practices (shift workers in the various global companies network). All of them are sub-networks of knowledge sharing [Zorska 2007, pp. 204–206].
The last mini-case study is General Electric; GE’s motto is “imagination at work” which means that the company realizes its business concept, trying to meet the challenges of a changing global environment, by providing the latest solutions. GE Energy Industrial Solutions LEADS is an acronym, which reflects five main challenges: Leading The Future of Electrification, Expanding globally, Addressing customer challenges, Demonstrating investment and commitment and Solving customer issues now. When analyzing the vision for LEADS one can see that in each of the indicated aspects, the emphasis is on the importance of innovation. It focuses on the ecological and more innovative, safer, more efficient industrial solutions, but also indicates a need to meet the specific needs of different customer groups. It emphasizes the importance of competence issues that foster the use of experience, the global potential and diversity to find new solutions, not necessarily the nature of product innovations, but the organizational process itself. In this way, GE emphasizes the essence of the new approach, an innovation seen as a combination of diverse global customer needs with professionalism and the potential of a global organization for the continuous development of modern technology solutions, services and products, methods of organization, etc.

The GE’s business model can be based on four elements: global thinking, experience, networking and innovation. The first three are pillars of GE’s systemic innovation as GBN orchestrators. “World thinking” in the case of GE is not only the action, but it is a form of reaching to almost every area of business space. Experience is the accumulated capital, synonymous with economic and intellectual capital, that is, the ability to multiply the tangible and intangible assets (including the knowledge of employees, brand equity). Networking is an organizational model that allows one to build links through the establishment of strategic relationships with customers and business partners. General Electric is, therefore, achieving a competitive advantage in the field, thanks to being a leader in technological innovation, but also and above all, the ability to act as a creative background for research and development (R&D centers) with a developed organizational base (system linkages within the global network), capital base (assets, sales, earnings, expenditures on R&D) and marketing base (brand), which will allow the creation of various forms of innovation [Rosińska-Bukowska 2012, pp. 277–278].

**Conclusions**

In all the above presented business models of leading transnational corporations, innovations are crucial. They are made up of not only new technologies and products but also good business practices and compliance to standards of sustainable development. Thus the perceived innovation allows these corporations to become market leaders, establishing standards, designating directions of development and stimulating subjects participating in their network to continuously improve
processes and organizational systems. The thesis posted at the beginning of this paper seems to be confirmed. The most powerful corporations that are GBN orchestrators usually have a permanent list of initiatives that activate customer and partner companies to present their ideas on the possibilities of innovative changes that could help speed up the development of products and services.

The key place of creativity and innovation in business models of all corporations subject to the observation points to their importance for a competitive advantage. As a result, constantly seeking to improve their competitiveness, corporations are becoming global centres of innovation and important points of the international chain of new solutions. Due to the fact that in various sectors of the market other participants gather around the most powerful corporations, one can easily identify the leaders of innovation. In each of the sectors there are only a few corporations capable of meeting this challenge and these are the orchestrators of the global business networks who, after crossing the path of the integration of business, have reached the highest level of organizational maturity. Currently, these systems act in three functions simultaneously: the conductor-manager indicating the direction of development, – the leader-promoter, and he who cares about the image and efficiency of the system – the coordinator-manager. They therefore become more than just a generator of ideas, resulting in new product solutions, but are responsible for coordinating the global innovation system within the network. As a result, procedural-organizational innovations dominate. Due to the fact that GBNs are the central focus of particular sectors, including their ability to set standards, set the pace of change, and control the direction of industry development, it can be said that powerful corporations which act as orchestrators are chain links in the international transfer of innovation and knowledge. A valuable insight is that investment in research and development (economic capital) obviously plays an important role, but the most important issues at present are other assets (intellectual capital) and they decide on the real innovation, therefore the success of the organization.

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KORPORACJE TRANSNARODOWE JAKO OGNIWA ŁAŃCUCHA MIĘDZYNARODOWEGO TRANSFERU WIEDZY I INNOWACJI

Streszczenie: Celem artykułu jest próba wykazania, że współczesne korporacje transnarodowe (KTN) nie tylko pełnią kluczową rolę w procesie transferu tradycyjnych rozwiązań innowacyjnych do podmiotów mniejszych czy gospodarek słabiej rozwiniętych, ale są centrami stale generującymi nowe strumienie wiedzy, dlatego stanowią istotne ogniwa międzynarodowego łańcucha kreacji innowacji. Artykuł składa się z trzech części. W pierwszej przedstawiono ewolucję spojrzenia na pojęcie innowacji i zaakcentowano konieczność szerszego ich postrzegania w dynamicznie zmieniającym się świecie. W drugiej starano się wskazać podstawy uznania korporacji transnarodowych za kluczowe ogniwa międzynarodowego łańcucha kreacji innowacji we współczesnej gospodarce opartej na wiedzy. W ostatniej części artykułu przywołano przykłady modeli biznesowych wybranych korporacji (Apple, Toyota Motor oraz General Electric) i dokonano ich analizy pod kątem zgodności z wyżej opisaną koncepcją.