This paper presents issues relating to knowledge management in a modern organisation and pays special attention to the models of knowledge management as well as the relationship between innovation processes and knowledge development. The main aim of this paper is to present the models of knowledge management in an organisation and the relationship between innovation processes and knowledge development. This paper is based on literature on the subject both by Polish and foreign authors, as well as employs deductive and inductive reasoning. Japanese researchers often refer to the notion of “organisational” creation of knowledge. However, an organisation is not capable of creating knowledge all by itself, i.e. without initiatives undertaken by others and interaction among them. The questions addressed in this paper have proven that issues relating to knowledge management are linked to a number of complex topics, which stems from the complexity of knowledge management itself. The management of modern organisations has become a difficult task, especially in the context of specific challenges to be met in the future. It is necessary to seek new institutional patterns and patterns of managerial behaviour.

**Key words:** knowledge management, organization, innovation

**JEL codes:** O30, O31
Introduction

The process of knowledge formation (or creation) is regarded as the most significant among the following: other components of organisational knowledge, conditions for knowledge creation, employee initiative, development of creative atmosphere and cooperation with organisations that create knowledge. The creation of knowledge in an organisation entails a continuous internal revival of this organisation. The interactive process of knowledge creation and hence the development of new ideas occur by the mechanism of life-long learning and the acquisition of new abilities (i.e. by the mechanism of accumulated organisational knowledge) and competencies developed as a result of this knowledge (Morawski, 2005, pp. 74–75). Japanese researchers often refer to the notion of “organisational” creation of knowledge. However, an organisation is not capable of creating knowledge all by itself, i.e. without initiatives taken by others and interaction among them. Once the knowledge has been created, it is specified more precisely by the members of a group who engage in a dialogue, share their experience, initiate discussions and make observations (Nonaka, Takeuchi, 2000, pp. 27–31). It is a well-known fact that knowledge is a product of effort made by the members of society and thus it is created and shared as part of a social process (Janasz, 2013, p. 46). A frame of reference for the social process is relational knowledge that is based on connotations produced as a result of a specific configuration of social relations. Furthermore, the process of knowledge management is a particularly important aspect to the functioning of a modern organisation. The main aim of this paper is to present the models of knowledge management in an organisation and the relationship between innovation processes and knowledge development. This paper is based on literature on the subject both by Polish and foreign authors, as well as employs deductive and inductive reasoning.

1. Models of knowledge management

The literature on the subject presents the following three concepts of knowledge management:
- the Japanese approach,
- the resource-based approach,
- the process-based approach.
The Japanese model is future-oriented. It is based on the concept of knowledge spiral and it was developed by Nonaka and Takeuchi (2000, pp. 27–31). They divide knowledge into two categories, namely tacit knowledge and explicit knowledge. They present the following four ways of knowledge conversion:

1. From tacit knowledge to tacit knowledge (socialisation), i.e. the process that involves experience sharing. Tacit knowledge takes the form of mental models and technical capabilities. It is acquired directly from others, i.e. without using any language. Students learn from their teachers and achieve mastery through observation, imitation and practice. Experience is a method for acquiring tacit knowledge.

2. From tacit knowledge to explicit knowledge (externalisation), i.e. when tacit knowledge is expressed by means of available notions. This is a complex process of knowledge creation during which knowledge becomes explicit by developing hypotheses, models, statements, notions, analogies and comparisons (metaphors). In order to formulate a specific vision, one uses language. A verbal form (writing) is employed to transform tacit knowledge into explicit knowledge. Although the following statement may seem incomplete or inappropriate, among four methods for knowledge conversion discussed in the present paper, externalisation is a basis for knowledge creation since it produces new ideas by using tacit knowledge. The essence of this process is to employ metaphors, comparisons, analogies and models in a sequence.

3. From explicit knowledge to explicit knowledge (combination). This type of conversion involves organising (categorising) and including a concept in the adopted (specific) system of knowledge, which involves combining different components of explicit knowledge. Knowledge is shared during meetings and conversations, in written documents and via computer networks.

4. From explicit knowledge to tacit knowledge (internalization), i.e. a form of conversion similar to “learning through action”, which entails that knowledge has become a useful resource. When a subject (human being) is gaining experience, they acquire tacit knowledge. This process involves experiencing, developing mental models and gaining technical capabilities. People accumulate knowledge, interpret it in their own way and then apply it. Internalisation is particularly important as it provides the operational knowledge of production (service) management. The combination of explicit and tacit knowledge initiates specific conversion processes that occur in continuous cycles.
The resource-based approach recognises a key role of a model known as “the wellsprings of knowledge”. The precursor of this theory, i.e. Dorothy Leonard-Barton, mentions the following sources (well-springs) of knowledge (Dolińska, 2010, p. 82):

- core capabilities that include physical and technical systems, managerial systems, employee knowledge and skills, as well as values and norms,
- joint problem-solving,
- implementation and integration of new technologies and instruments,
- experimenting,
- import of knowledge.

The aforementioned elements of the model developed by Leonard-Barton refer to the inside of an organisation (i.e., implementation and integration) and organisational environment (i.e. import). They concern the present and the future. A mechanism that integrates all elements of this model is referred to as core capabilities. The resource-based approach has significantly increased the awareness of the role that knowledge plays as a strategic resource. To be more precise, knowledge has become a source of competitive advantage on the market. It provides an advantage in terms of organisational management by paying special attention to intangible assets held by an organisation (Mikuła, Pietruszka-Ortyl, Potocki, 2002, p. 69).

On the other hand, the process-based approach pays special attention to experience gained by large consulting companies and solutions they produce. This theory was developed by Davenport and Prusak (1988). According to them, knowledge management, understood as a process, consists of the following sub-stages: knowledge location, knowledge acquisition, knowledge development, knowledge sharing, knowledge diffusion, knowledge expansion (enrichment), knowledge application and knowledge accumulation. The process-based approach to organisational management considers an entity as a complete process that identifies a specific sequence of activities to be performed.

The process-based approach is based on the assumption that certain constraints are placed on a continuous and dynamic process, i.e. it should end at a specific moment in time and at a specific point in an economic (technical or financial) cycle. This theory integrates time, quality and prompt completion of specific activities aimed at delivering clients with an outstanding value. These activities are aimed at producing a strategic effect, namely flexibility which, in turn, enables to achieve a competitive advantage. The process-based model defines how (methodology)
organisations create and use knowledge by following the aforementioned sequence of operational stages, namely knowledge development, knowledge codification and knowledge transfer. Knowledge development consists in the following four activities: acquisition of knowledge, release of resources, internal mergers, and networking. In every process-oriented organisation, the responsibility for the outcome of a process rests with the owner, i.e. a person in charge who manages the entire process. On the other hand, on a functional level, the owner is accountable for knowledge acquired by participants.

The process-based approach entails teamwork. Both are largely based on an open structure of a learning organisation. Open structure enables to eliminate barriers between employees working at different levels and in different departments. Finally, open structure facilitates the dissemination of knowledge and contributes to the successful completion of the process.

2. Organisational capability to create and absorb knowledge

An organisation or a country that intends to become a knowledge-based entity should pay special attention to increasing the scale of innovation activity. This goal can be achieved through development based on incremental innovation that occurs by absorbing knowledge from the outside, i.e. by allowing external flows of knowledge. As a consequence, an organisation is able to maximise its potential for growth, which makes it hypothetically possible to use knowledge created by others. This path (strategy) to development is successfully followed by organisations (economies) known as the Asian Tigers. These organisations (countries) have successfully combined “learning through action” with conducting innovation activity.

It is a well-known fact that incremental innovations produce specific external effects, namely an organisation learns and develops knowledge. These effects arise from knowledge diffusion. For the sake of knowledge transfer, different channels are used (Majewska, Szuleczyńska, 2012, p. 105). In other words, already acquired (created) knowledge is a basis for incremental innovations, i.e. practical uses of existing knowledge. The absorption of knowledge from different channels and the flows of knowledge that are produced, e.g. by imitating others’ ideas (solutions), facilitate the technological progress of an organisation. The capability for knowledge absorption enables an organisation to conduct innovation activity by using
knowledge resources that this organisation has at its disposal. This is possible since knowledge has a simultaneous and non-linear character (Majewska, Szulczyńska, 2012, p. 5). The former entails that the same knowledge can be applied by different organisations and persons at the same time. The latter demonstrates itself in that the same knowledge used by different organisations or countries provides different results, i.e. a variety of incremental innovations. Hence, organisations (countries) that have acquired identical knowledge are able to develop at their own pace owing to their individual potential for absorption, and particularly their technical knowledge or capability for learning. As a result, incremental innovations vary considerably despite the fact that certain organisations use the same knowledge (Hatch, 2002, pp. 157–159).

As far as modern times are concerned, investments in intangible assets have increased, particularly in such countries as Finland, the USA, Sweden and Great Britain where the level of these investments exceeds the level of investments in physical capital (OECD Science, 2011). It has long been discussed whether the accumulation of knowledge is more important for the pace of organisational growth (economic growth) than the accumulation of capital. Growing number of researchers agree that it is the accumulation of knowledge that plays a more significant role (Kubiela, 2009, p. 225).

As for the stage of development that an organisation or a country may reach, Polish economy has entered the phase of transition between development stimulated by effectiveness and development stimulated by innovation. Hence, two scenarios are possible (Soszyńska, 2012, p. 44), i.e. either an advanced is reached or the economy re-enters an initial stage of development. The latter option is a severe slump particularly in the context of the future development of an organisation (a country).

According to the literature on the subject, the main difficulty in socio-economic development is the achievement of satisfactory potential as well as organisational (economic, social) capability to create and absorb knowledge, particularly technological knowledge. That being so, it is widely agreed that knowledge has always been a major factor determining economic growth in countries that have reached long-term socio-economic potential by making a sustained investment effort. In other words, these countries are not only able to create and absorb knowledge, but also they have reached an advanced stage of socio-economic development (Soszyńska, 2012, pp. 44–45). A disproportion between the standards of European
science and education as well as inability to translate these standards into economic and technological success is known as “European paradox” (Galar, 2009, p. 43). This notion refers particularly to breakthrough innovations that are essential for gaining a competitive advantage and generating a new impulse for development.

3. Knowledge management in an innovation process

In recent years, researchers have attempted to identify the relationship between innovation processes and knowledge development, which is the case, e.g. with the model of innovation spiral process (Merx-Chermin, Nijhof, 2005, pp. 135–147). This concept (model) has been developed in order to find if there is a relationship between the creation of learning organisation, knowledge organisation and innovative organisation. This model includes three processes (sub-processes), namely knowledge creation, innovation and learning to learn. Each process is an element of a specific cycle that arises from the influence from the following opposing forces, i.e. stakeholders, leadership, organisational structure and strategic alignment. As it has already been emphasised, innovations make use of newly created knowledge. They open new possibilities by using different combinations of existing knowledge. This is the case both with technical feasibility of a product as well as with a situation arising in organisational environment that enables to satisfy an individual need. Such knowledge may have various sources, namely experience, technology analysis, market research or competitor analysis. Innovation management makes it essential to apply knowledge which is composed of different elements forming a coherent whole. This process is known as innovation architecture. The concept of key innovations is presented in the form of the following four zones (Tidd, Bessant, Pavitt, 2005, pp. 17–18):

- Zone 1 – incremental innovation.
- Zone 2 – modular innovation.
- Zone 3 – discontinuous innovation.
- Zone 4 – architectural innovation.

In the 1st zone, products (processes) or services are steadily improved. For the sake of this improvement, knowledge accumulated around core components is applied. In the 2nd zone, there is a need to acquire new knowledge, which occurs within a well-established framework. However, the overall architecture remains
unchanged, i.e. does not entail major shifts or dislocations. The 3rd zone involves discontinuous innovation where neither the final result nor paths leading to such innovation are known. In other words, the set of rules is subject to change which provides a ground for new players to enter the game. Finally, in the 4th zone, new possibilities and combinations emerge as a consequence of needs expressed by different groups of users (reconfiguration of knowledge sources and configurations). In this zone, existing knowledge is used and recombined in a number of ways, or old knowledge is combined with new knowledge.

The model of innovation process is modified by adding subsequent important elements (components) and by adding feedback between these elements. Innovation model resembles a network including primary and secondary feedback between the components of the model and including a growing number of factors (Janasz, Kozioł-Nadolna, 2011, pp. 114–116; Kozioł-Nadolna, 2012, pp. 297–302). One such model, known as open innovation, was developed by Chesbrough (2003). The novelty of this concept lies in the fact that the process of open innovation has become an integral part of innovation strategy followed by an organisation and an integral part of a business model. The main assumption behind the concept of open innovation is that in the world of available and largely spread knowledge, organisations cannot rely solely on their own research. They should share their knowledge, adopt solutions from other organisations, offer their own solutions – which they have not adopted for a variety of reasons – to other entities by licensing or by launching spin-offs.

Deviating from the model of closed innovation and gravitating towards the model of open innovation is a consequence of the following “destructive forces” (Chesbrough, 2002):

- globalisation resulting in geographic expansion of markets as well as increased division of labour and specialisation,
- development of instruments, e.g. intellectual property protection and venture capital, that enable knowledge resources and tangible assets to cross the boundaries of an organisation,
- increasing mobility of labour market, mainly the case with specialists,
- development of new technologies – especially information and communication technologies – that have a profound impact on innovation activity.

The scale of changes occurring as a result of the aforementioned factors (mechanisms) as well as complex phenomena such as offshoring, industrial or
economic dislocation have contributed to the creation of a new economic map of the world and to the creation of a new society referred to as homo sapiens globalis (Rybiński, 2007, pp. 20–30). The process of globalisation will continue to have a significant impact on development prospects for organisations, cities, regions, countries and continents. On the one hand, globalisation is an unstoppable phenomenon that may produce a number of positive effects but on the other hand, it may have an adverse impact and produce an effect known as “crowding-out”, i.e. when negative socio-economic phenomena are pushed out of areas (organisations, agglomerations, countries) that are strong in economic terms to areas that are weaker in this respect. This is the case particularly with small and medium-sized organisations as well as small economies that are often not able to compete with large organisations or economies (Janasz, 2012, p. 61).

As for the model of open innovation, the main principle is to maximise the value of different ideas that may be produced both inside and outside an organisation. In other words, boundaries between an organisation and organisational environment are open, which shortens innovation process itself. The institutional framework of an organisation is just a symbolic boundary between an organisation and organisational environment as far as the flows of knowledge are concerned.

Nowadays, open innovation solutions are used as part of innovation processes to a growing extent. These solutions may differ in terms of a form and scope, namely from innovative solutions inspired by consumer needs (user-driven innovation) to innovation process organised as open source business. Growing number of organisations have opened to their environment and their stakeholders by engaging them in innovation processes and cooperating with their clients in producing new solutions.

As for closed innovation, organisational boundaries are “hermetic”, hence the flows of knowledge occur inside an organisation and go through successive stages of internal assessment. Needless to say, these flows lack feedback from the market, i.e. consumers.

As it has already been emphasised, open innovation model is not the only open approach to innovation management. There are other concepts that take account of similar resources and are put into practice. They involve the following conditions: openness, cooperation as well as putting own and others’ ideas into action, i.e. knowledge sharing (Kozioł-Nadolna, 2012, p. 300).
One concept emphasising openness in innovation management is referred to as Triple Helix Theory. This concept defines innovation activity as an outcome of cooperation among three types of institutions, namely entities representing the sector of science, government administration bodies, and organisations representing private sector (Etzkowitz, 2008). According to the Triple Helix Theory, the type and level of economic growth in a given area depend on formal and informal agreements between public sector and private sector. Major importance lies in links between the bodies of local and regional administration and the sector of science. The last-mentioned sector is represented by higher education institutions (i.e. universities, private higher education institutions), different types of R&D institutes, as well as industrial and business environment. The Triple Helix Theory refers to the following three dimensions:

- organisational transformations occurring in entities representing one of the aforementioned sectors (development of links between industrial organisations, or increased scope of university’s mission),
- influence of entities representing one sector on entities representing another sector (influence of innovation policy on R & D and organisations),
- creation of new networks (structures), hence interaction among all three sectors and, consequently, the production of new ideas (Jasiński, 2006, pp. 29–34).

The other concept that falls into the category of openness was developed in the 1990’s and is referred to as open source. It enables one to use a source code legally and free of charge, as well as to modify it freely. Growing number of organisations have opened to their environment and their stakeholders by engaging them in innovation processes and cooperating with their clients in producing new solutions. Innovations developed by users are closely connected to the notion of free revealing, i.e. unrestricted access to confident information concerning innovation that is disclosed free of charge and is financed privately by persons and organisations and hence is considered the common good. According to experts, organisations can employ both free revealing (i.e. share their knowledge free of charge) and licensing since they may be used in a complementary fashion – based on interaction and cooperation (Open Source, 2011). In specific circumstances, licensing seems to be more favourable, while in other cases free revealing is more advantageous in terms of the common good.
The main difference between open innovation and open source lies in the fact that in the former case sharing innovative solutions does not exclude intellectual property protection, e.g. by patenting.

One more concept based on the openness of innovation processes is referred to as the Lead User Method (von Hippel, 2005). It entails identifying and understanding explicit and implicit consumer needs and trends. The method involves engaging consumers in the process of creating a product (a service) and hence is based on information provided by consumers, and particularly the dissatisfied ones.

According to the report “Poland 2030. Development Challenges” (Polska 2030…, 2009), intellectual capital provides a foundation for development. This capital is understood as: “(…) all intangible assets at the disposal of people, enterprises, societies, regions and institutions that, when used properly, may be a source of current and future national well-being” (Polska 2030…, 2009, p. 206). The document highlights such issues as so-called development capital which is defined as: “(…) social network capital, i.e. based on social ties other than the closest relations. Finally, development capital is the ability to perform an original and creative activity, both individually and collectively. A society with a strong development capital is open to other people’s attitudes, views and ideas, is able to cooperate, is innovative and creative, which is important not only as a key factor behind the development of knowledge-based societies, but also as the ability to live in an ever-changing world.” (Polska 2030…, 2009, p. 339). It can be concluded that the concept of creative (innovative) economy, which is considered a new management paradigm, is based on the following assumptions (Różga-Luter, 2004):

- acceleration of knowledge in the modern world,
- growing importance of intangible capital,
- innovation as a priority activity,
- revolution in knowledge resources.

Conclusion

The questions addressed in this paper have proven that issues relating to knowledge management are linked to a number of complex topics, which stems from the complexity of knowledge management itself. The management of modern organisations has become a difficult task, especially in the context of specific
challenges to be met in the future. Hence, it is necessary to seek new institutional patterns and patterns of managerial behaviour. Such a scenario makes an organisation face new challenges, which entails the need for constant redefining organisational mission and strategy, modifying organisational structures, improving employee competencies, creating effective systems for learning and developing the ability to produce strategic solutions to situations arising in organisational environment, in other words, the ability to revive an organisation (Wawrzyniak, 1999). The aforementioned activities are on the one hand, the outcome of widely understood knowledge and practice. On the other hand, these activities are aimed at creating and developing knowledge, human capital and, most of all, organisations in which this capital is engaged, i.e. they provide mechanisms for the creation of organisational knowledge.

The process of globalisation will continue to accelerate owing to which markets have an international reach, key factors behind the selection of production factors are subject to change (i.e. organisations may choose from a variety of production sites and places of sale, which removes constraints imposed by external competition), and intellectual capital has become one of the factors determining a competitive advantage. Globalisation has contributed to the fact that foundations for organisational development (strategic management, international management) have undergone major changes. Since knowledge has become the main strategic resource based on which advantage is gained on competitive markets, management (and particularly strategic management) has become one of the most significant spheres of organisational management (Janasz, 2016, p. 35). What is also observed is a relatively growing importance of “soft” resources (competencies, norms, cultural values, relations, systems and attitudes). “Soft” resources are the outcome of intellectual and creative activities performed by human capital engaged in organisations.

Bibliography


ZARZĄDZANIE WIEDZĄ WE WSPÓŁCZESNEJ ORGANIZACJI

Streszczenie

W artykule przedstawiono problematykę zarządzania wiedzą we współczesnej organizacji, koncentrując się na ich modelach, jak również na związku występującym między procesami innowacyjnymi a rozwój wiedzy. Japońscy badacze posługują się często pojęciem „organizacyjnego” tworzenia wiedzy. Organizacja nie może jednak wytwarzać wiedzy sama, bez inicjatywy jednostek i ich grupowych interakcji. Celem niniejszego artykułu jest przedstawienie modeli zarządzania wiedzą w organizacji, jak również związku występującego pomiędzy procesami innowacyjnymi a rozwój wiedzy. Opracowanie powstało na podstawie analizy literatury krajowej i zagranicznej, z wykorzystaniem
wnioskowania dedukcyjno-indukcyjnego. Zasygnalizowane kwestie wskazują na to, że problematyka zarządzania wiedzą dotyczy wielu skomplikowanych kwestii, co wynika ze złożoności tego procesu. Zarządzanie współczesnymi organizacjami staje się coraz bardziej złożone wobec określonych wyzwań, jakie niesie ze sobą przyszłość. Oznacza to konieczność poszukiwania nowych wzorców instytucjonalnych i zachowań kierowniczych w praktyce. Taka sytuacja pociąga za sobą nowe wyzwania dla organizacji, co oznacza potrzebę stałego redefiniowania misji i strategii podmiotów.

Słowa kluczowe: zarządzanie wiedzą, organizacja, innowacje