# THE JAPANESE MODEL OF KNOWLEDGE MANAGEMENT

Grażyna GIERSZEWSKA

Faculty of Management
Warsaw University of Technology, Warsaw, Poland
e-mail: g.gierszewska@wz.pw.edu.pl

***Abstract**:* The effectiveness of Japanese management methodologies is making them increasingly popular with business organisations all over the world. This paper aims to present one of the least known knowledge management theories: the knowledge creation model by I. Nonaka and H. Takeuchi. In their approach to the theory of organisational learning and knowledge creation, Nonaka and Takeuchi propose a categorisation of knowledge into tacit and explicit (formal) knowledge and explore the relationships between knowledge production, transfer and application; they also address the issue of applying existing and creating new knowledge. Presented SECI model captures the conversion of tacit knowledge into explicit knowledge in four steps: Socialisation, Externalisation, Combination and Internalisation. The paper examines case studies that illustrate the practical application of the processes.

***Key words:*** knowledge management, tacit knowledge, explicit knowledge, model by I. Nonaka and H. Takeuchi, knowledge spiral.

## 1 Introduction

Japanese management methodologies have widely been credited for the spectacular global success of numerous businesses from the *Land of the Rising Sun*. Concepts and techniques such as *Total Quality Management* or *TQM1*, *Kaizen*, *Kanban*, *HOSHIN* or *Hoshin kanri*, and *Just in Time* have been recognised and implemented in organisations in many different cultures and geographies since the 1970s.

Japanese management methodologies are standardised, procedure-driven and based on 'regimes'. As such, they are usually quite difficult to transplant directly in their indigenous form to European or American business organisations which tend to have a radically different corporate culture. These methodologies offer a unique approach to people motivation and there is a great emphasis on professional development, demonstrating individual innovation and creative thinking. Well developed and loyal human resources are considered to be among the most valuable assets. Customer and supplier relations are based on close relationships and collaboration. This offers a competitive advantage driven by high quality products, strong productivity, short lead times and low costs. Organisations which are not powerful market players with access to vast capital resources may still become very successful by putting in place many of these principles. Being observant and making adjustments to everyday operations will usually be enough. Knowledge management will be much easier in organisations which operate to these principles and have established such practices.

Knowledge management is not just about strategy, however. It is based on well identified and analysed available and critical resources. Knowledge is one of such critical resources in an organisation. Incremental steps must be taken to implement measures and processes to achieve the goals and objectives of the organisation. Knowledge management leads to the deconstruction of stereotypes in order to accomplish measurable success[2]. A new management philosophy is required, which offers a new mind set and a new way of interpreting social, economic and corporate developments. A paradigm shift in management is essential to break away from traditional and, indeed, obsolete ways. Knowledge management offers itself as the new paradigm in business.

In knowledge management, it is the human resources that have attracted companies' and event countries' attention as a possible source of competitive advantage. In fact, countries can develop their own research and development potential and take advantage of the

[1] Quality Management as a method of organisational improvement was developed in the U.S. by E. Deming. Since his ideas were not embraced by American businesses at the time he promoted them in Japan. He is believed to be amongst the architects of the Japanese economic miracle as TQM found its way to many different sectors in the 1960s.

[2] T. Kuhn - *The Structure of Scientific Revolutions.* New American Library, New York 1986, preface.

opportunities offered by modern information and computer technology[3].

L. Edvinsson observes that 'knowledge has become the main source of wealth not only at the level of organisations but also countries'[4]. However, knowledge if not applied in manufacturing and services will not by itself drive economic growth; high technology, mainly information technology, is merely a tool or a means to achieve the end.

There is an increasing amount of criticism towards traditional management concepts and models. The world is transforming, the era of mass manufacturing, autocratic management, 'silo' and fixed structures is coming to an end. Management practice is affected by changes in global systems, macroeconomic and competitive environments and evolving business organisations. Organisation's dependence on the external environment has become self-evident. The dynamic of environmental transformation is growing faster and brings business to a whole new level. This is manifested by the reconfiguration of needs and the expected ways of satisfying them by businesses. Past experience and existing procedures are rendered irrelevant and there is a strong pressure for new behaviour. There is an incessant demand for new and effective business management techniques.

Not all Japanese management methodologies are new but they are certainly new to Polish entrepreneurs. With their corporate culture, people motivation systems, employee innovation and creativity, continuous improvement and people perceived as a strategic asset, Japanese companies are well equipped to embrace knowledge management.

## 2 The essentials of the knowledge management model by I. Nonaka and H. Takeuchi

I. Nonaka and H. Takeuchi observe that while knowledge is at the centre of attention in business organisations and in society no one has yet examined the mechanisms and processes of knowledge creation[5]. However, everyone agrees that managing knowledge is very much different from managing tasks, functions or people and that it requires a special approach to:

- strategy,
- organisational structure,
- communication systems,
- human resources policy,
- management skills.

The point of departure for I. Nonaka and H. Takeuchi is the classification of knowledge into 'tacit' and 'explicit' (formal), as suggested by M. Polanyi[6].

Knowledge is created as a product of interactions between people and this is how tacit knowledge turns into explicit one. Explicit knowledge is structured and formalised; it can easily be transferred to others and shared. It takes a number of different forms such as books, documents, specifications, manuals, mathematical theorems or network resources.

Tacit knowledge is related to an individual who possesses it and it is hard to formalise and transfer it to others. This type of knowledge may be captured in the following statement: 'we know more than we can say'. Tacit knowledge is 'intangible', difficult to express and very individualised and related to the person's accumulated experience in various areas of human endeavour. Tacit knowledge can be expressed not so much by words alone but also by idiosyncratic actions that have to be practiced and taught to the 'uninitiated' in order to help them learn to copy them. Tacit knowledge is made up of thought models, beliefs and preconceived notions so deeply rooted in our minds that we take them from granted, which makes it ever so more difficult to articulate them[7].

[3] J. Woroniecki - *Nowa gospodarka: miraż czy rzeczywistość? Doktryna, praktyka, optyka OECD* (New Economy: Mirage or Reality? OECD Doctrine, Practice and Perceptions) [in] Gospodarka oparta na wiedzy. Wyzwanie dla Polski XXI wieku (Knowledge-Based Economy. Challenges for Poland in the 21st Century) (ed. A. Kukliński), Committee for Scientific Research, Warsaw 2001, p. 48.

[4] L. Edvinsson - *IC Entrepreneurship for Knowledge Capital as the New Source of Wealth of Nations* [in] *Intellectual Entrepreneurship through Higher Education* (eds. S. Kwiatkowski and J. Sedlak). Publishing House of the Leon Kozminski Higher School of Enterprise and Management, Warsaw 2003, p. 21.

[5] I. Nonaka, H. Takeuchi - *Kreowanie wiedzy w organizacji. Jak japońskie spółki dynamizują procesy innowacyjne* (The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation). Poltext, Warsaw 2000, p. 24.

[6] M. Polanyi - *Personal Knowledge: Towards a Post-critical Philosophy*. Routledge & Kegan Paul Ltd., London 1958.

[7] I. Nonaka - *The Knowledge-Creating Company* [in] Hitotsubashi on Knowledge Management (eds. I. Nonaka, R. Toyama, N. Konno), John Wiley & Sons, Singapore 2004, p. 98.

Specific tacit knowledge may be acquired through shared experience or by being close to its holder. Metaphors, analogies and associations, being part of the language, may lead to understanding, and consequently to the acquisition of tacit knowledge.

The classification of knowledge into two forms is the basis for knowledge creation in the company, i.e. the conversion of knowledge through management processes, the organisational context of knowledge acquisition and processing, the places of knowledge creation and defining the knowledge assets.

I. Nonaka and H. Takeuchi are considered to be representatives of a coherent and systemic approach to knowledge management. They recognise two important perspectives on the practical application of knowledge:

- the interdependence of knowledge creation, transfer and application,
- the use of existing knowledge and the creation of new knowledge[8].

The knowledge management process is a linear sequence starting with creation, through transfer all the way to application.

Another process is an interactive one and it involves such knowledge management processes that recognise multidirectional relationships between elements. According to M.H. Zack, the capacity to take advantage of existing knowledge and to generate new one requires exploitation and exploration[9]. Creating new knowledge is to be a long-term strategic goal and most activities in an organisation must be focused on exploiting the existing knowledge, i.e. on the short-term operational objectives.

Knowledge has a characteristic of being complex, hard to absorb, transfer and apply. In contrast to other resources, knowledge is dominant, inexhaustible, simultaneous and non-linear[10]. It dominates because it is a top priority resource. Unlike other resources in organisations, it cannot be exhausted because the more it is used the higher its value. Simultaneity results from the fact that it can be used by multiple people in different places at the same time.

Non-linearity implies a general pattern: a small input of knowledge may make a major difference or the same 'dose' of knowledge applied in one organisation may yield different results than if applied in another. The above characteristics of knowledge make it a unique resource which requires a unique approach.

I. Nonaka and H. Takeuchi point out that the exploitation of knowledge in an organisation must be closely interrelated to the exploration for new knowledge. They present three aspects of this management process: static, empowered and dynamic. The static aspect relates to the structure of the organisation. For example, an organisation described as 'hypertextual' may facilitate the knowledge management process. Empowerment means the need to create functions within an organisation that will be directly responsible for knowledge management such the Knowledge Manager, Knowledge Workers, Knowledge Engineers. The dynamic aspect is one where knowledge triggers change in the organisation. Knowledge has a strategic dimension - it shapes and moulds the organisation's status quo and, more importantly, its future configuration.

The knowledge creation model relies on an organisational structure similar to that of hypertext or a multilayer or multi-contextual document[11]. Hypertextual organisations combine two traditional structures: bureaucratic and project-driven. It is made up of mutually interrelated layers of a business system, project team and the knowledge base. The business system is the central layer where day-to-day routine business operations are completed. This layer is structured bureaucratically and forms a conventional hierarchical pyramid. At the top is the 'project team', in which knowledge creation processes take place as a result of interactions between groups, teams and individuals. The knowledge base layer lies at the bottom and its position harmonises with its expected function of a receptacle of all knowledge generated in the other layers and a reconfiguration engine design to produce a value added output. Knowledge is embedded in the corporate vision and culture, in technologies, external relations etc.

[8] B. Wawrzyniak - *Od koncepcji do praktyki zarządzania wiedzą w przedsiębiorstwach* (From Concept to Practice of Managing Knowledge in an Organisation) [in] Zarządzanie wiedzą w przedsiębiorstwie [at] Materiały konferencyjne PFPK i WSPiZ (Knowledge Management in an Organisation. Conference Proceedings of the Polish Foundation for Management Promotion and the Higher School of Enterprise and Management). Warsaw 2001, p. 24.

[9] M.H. Zack - *Developing a Knowledge Strategy.* California Management Review, Vol. 40, Summer, 1999.

[10] A. Toffler, H. Toffler - *Budowanie nowej cywilizacji. Polityka trzeciej fali* (Creating a New Civilisation. The Politics of the Third Wave), Zysk S-ka, Poznań 1999, p. 17.

[11] I. Nonaka, H. Takeuchi - *The Knowledge-Creating…,* op. cit., p. 196.

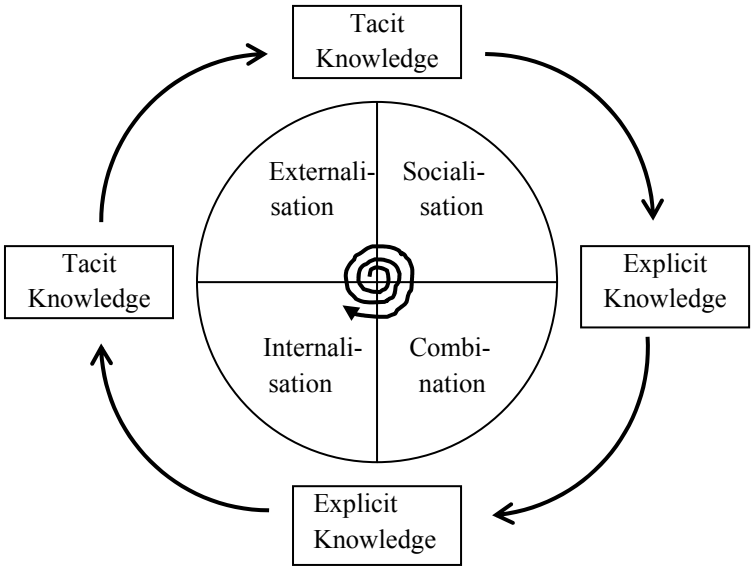


Figure 1. Knowledge spiral
(*source - based on: Kreowanie wiedzy w organizacji. Jak japońskie spółki dynamizują procesy innowacyjne [The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation] Poltext, Warsaw 2000, p. 96*)

A hypertextual organisation combines different layers with the bureaucratic organisation being complementary to the project-driven organisation.

The knowledge creation process is described by H. Takeuchi and I. Nonaka as a dynamic cycle of seamless flows of knowledge through three layers. Members of project teams come from different parts of the organisation and they create knowledge in the course of implementing a project within the guidance of the corporate vision.

Having completed their project they turn to the knowledge base layer to inject a new portion of knowledge into it. Knowledge is then reclassified and shared with the rest of the organisation. The project team go back to the business system layer to do their routine tasks until such time when they are called upon to take up a new project challenge. The ability to seamlessly and quickly switch contexts determines the organisation's capacity to create new knowledge.

An organisation must not only be responsive but also adaptive in a turbulent environment. A reactive approach and processing external information is not sufficient. Organisations themselves ought to generate new information and knowledge because this is the only way they can influence their environment and make a difference through a feedback mechanism. External knowledge is absorbed by organisations in the form of data or information and they will turn into actionable knowledge and, indeed, into new knowledge only if enriched. These cycles are iterative and this is the very central point of the model proposed by I. Nonaka and H. Takeuchi.

## 3 Knowledge spiral

The model of conversion of tacit knowledge into explicit knowledge refers to the dynamic aspect of knowledge management and involves the following steps[12]:

- socialisation,
- externalisation,
- combination,
- internalisation.

The development and conversion of knowledge or SECI forms a timed and logical spiral of knowledge (conf. Fig. 1).

The cycle known as SECI starts with socialisation, continues through externalisation, combination and ends with internalisation. It is at the heart of the knowledge creation process in an organisation. It forms a spiral which portrays the way knowledge is developed quantitatively and qualitatively, how it moves from the individual level to the level of the group and the entire

[12] Ibidem, pp. 85-95.

organisation. Knowledge development and creation are results of social and dynamic interactions between tacit and explicit or formal knowledge. Knowledge originates in a spiral at the interface between two dimensions; the epistemological and the ontological. The epistemological dimension manifests itself in the differentiation between the various types of knowledge and the ontological dimension relates both to the organisation but also extends beyond it and affects its environment. The epistemological dimension refers to the content, i.e. tacit versus formal knowledge and the ontology refers to the character and structure of knowledge, i.e. its origins. The four levels of knowledge should also be recognised: individual, group, organisational and inter-organisational.

The knowledge management model in a business organisation should be sensitive to the methods of knowledge creation, acquisition, maintenance, transfer and the fact it can be a product. Consequently, this means knowledge can be traded as any other goods or services. Notably, knowledge is not monosemous – it is relative and open to different individual interpretations[13]. Knowledge is dynamic and quickly becomes oblivious. Knowledge can be structured in technologies, procedures, organisational files, people competences and databases. Knowledge materialises in commercial products. In the turbulent world of today it is essential that knowledge should be seen as a factor reducing risk and uncertainty.

How should the knowledge spiral be interpreted? First, it is a unique process of knowledge conversion. Socialisation builds a 'field of interaction' which facilitates knowledge sharing among employees. Externalisation is based on a metaphor or an analogy and triggers a dialogue, a collective reflection allowing the tacit and barely transferrable knowledge to be released. The combination helps amalgamate tacit knowledge into the existing knowledge in the organisation, which is then internalised at the end of the spiral as the new knowledge is put to practical use, i.e. through 'learning by doing'. The application of knowledge created by the 'spiral' should be understood as follows: socialisation only allows a different perspective on a mode of operation or product. Externalisation directly expresses the concept deduced from socialisation which will then guide the development of a new product or services. Combination is where the concept is structured and implemented. Internalisation allows knowledge to spread widely throughout the organisation and become concurrently actionable in multiple locations.

### 3.1 Socialisation

Socialisation consists in observing and practicing the observed skills so that they become part of the existing knowledge. Socialisation helps tacit knowledge to expand. Members of the organisation share the 'thought models' and technical skills thus building up the corporate culture. Socialisation occurs when the tacit knowledge of an experienced employee or a 'master' transforms into the tacit knowledge of the 'student'. This is best observed in a joint involvement in a project, solving a specific problem and decision-making. Socialisation is about sharing and creating new knowledge through personal experience – it is a process of transferring knowledge from the individual level to the individual level and is strongly linked to group work theories.

The European Heritage Days are a good example of knowledge socialisation at a regional level.

**European Heritage Days in Poland[14]**

European Heritage Days is a joint project of the Council of Europe and the European Commission. The idea to celebrate the European Heritage Days was proposed in the Spanish region of Granada on October 3, 1985. During the second European Conference of Ministers Responsible for Culture and Heritage, Jack Lang, French Culture Minister put forward a proposal to extend the Open Days of Heritage Sites initiated in France in 1984 across the entire European continent. The proposal was enthusiastically welcomed and the Council of Europe decided to hold regular European Heritage Days. Poland has taken part in EHD since 1993 (50 countries participated in the event in 2010). The project consists of a number of initiatives implemented by local authorities, cultural institutions, com-

[13] B. Mikuła, A. Pietruszka-Ortyl, A. Potocki - *Zarządzanie przedsiębiorstwem XXI wieku. Wybrane koncepcje i metody* (Managing a Business Organisation in the 21st Century. Selected Concepts and Methods). Difin, Warsaw 2002, p. 72.

[14] The case is based on data contained in the Bachelor Diploma Paper by M. Rembacz - *Bachelor Diploma Paper: Zarządzanie projektem społeczno-edukacyjnym na przykładzie europejskich dni dziedzictwa* (Management of a Socio-Educational Project Based on the European Heritage Days Case Study), Łazarski University, 2011.

panies, civil society organisations and private individuals at the regional level.

One important element of the specific projects in individual countries is the tacit knowledge accumulated by participants. The socialisation of knowledge in the EHD projects leads to new challenges embraced by organisers. The following items were listed in 2010:

- improve public awareness of the various types of intangible heritage, rites, traditions etc.,
- direct public attention to the need for the protection, conservation and reuse of historical heritage sites,
- promote collaborative attitudes and create opportunities for joint projects within EHD,
- promote regional cultural heritage and improve the awareness of the common roots of European culture,
- strengthen intercultural dialogue,
- highlight the awareness of all EU citizens of the importance of cultural diversity,
- underline the contribution of the various culture to the heritage of European countries,
- increase the importance of education as vehicle of the transfer of knowledge on cultural diversity.

The Polish 2010 edition of EHD consisted of 1,463 events which attracted nearly 300,000 participants. Visits to cultural institutions during admission-free days accounted for only 20 per cent. The vast majority of events were EHD-specific educational projects.

The socialisation of knowledge demonstrated that the development of European Heritage Days must be preceded by an adequate ex ante evaluation, needs assessment and ex-post evaluation in each country involved. Last but not least, lessons learns must be collected both within individual countries and on project-wide scale.

### 3.2 Externalisation

Externalisation is a process of converting tacit into formal (explicit) knowledge. Formal knowledge is maintained in documents, manuals, patents, audio files and computer programs. Externalisation means ensuring the availability of tacit knowledge to other members of an organisation. *Externalisation is process of expressing tacit knowledge using available concepts. It is a complex process of knowledge creation in which tacit knowledge released to others in form of metaphors, analogies, concepts, hypotheses or models [...] and it is a key to knowledge creation because it delivers new ideas based on tacit knowledge*[15].

Externalisation is the heart of knowledge creation. It is here that ideas are developed based on tacit knowledge. One way of improving the level of knowledge among employees is provide training. It is much more challenging to translate the training needs to the strategic goals and objective and the efficiency of training. Let me use an example of a major retail chain which operates in Poland.

The training management function is decentralised in this retail chain, which means that operations in each country have the right to organise training based on their local needs. Managers at all levels submit their training needs which are then approved and coordinated. Training is tailor-made. The organisation has established a Vocational Development School. The leading role at the school is played by the department which has posted the strongest performance (audited) in a given period. The department manager has a role of a mentor and coach to other similar departments in the area. In addition, employees receive training to improve their skills and help externalise their knowledge. Such training if often delivered by line personnel. Trainees can learn product formulas and share their customer relationship experience. Employees feel that being invited, as rank-and-file employees, to conduct training workshops is a token of recognition and acknowledgement. The organisation has launched a forum for exchanging customer service and store work configuration ideas. Best ideas from employees are recognised and implemented in the entire chain, which has been welcomed by managers and customers alike[16].

### 3.3 Combination

Combination is a process leading to the expansion of formal knowledge. Explicitly, it means combining various types and forms of formal knowledge to generate new formal knowledge. Processing data to generate management information and formulating strategies are two major examples of combination. Combination is

[15] I. Nonaka, H. Takeuchi - The *Knowledge-Creating…,* op. cit., pp. 88-91.

[16] *Strategie przedsiębiorstw a zarządzanie wiedzą* (Business Strategies and Knowledge Management), (eds. J. Dąbrowski and G. Gierszewska), Publishing House of the Higher School of Enterprise and Management, Warsaw 2005, pp. 249-251.

structuring and applying formal knowledge and transferring it from the group level to the level of the entire organisation. It derives from information management theories and information technologies.

The combination of different components of explicit knowledge, after it is selected and categorised, leads to the emergence of new knowledge. New concepts may be combined with existing ones and this stimulates change. In the business context, combination may be manifested by the redefinition of existing knowledge, especially if new knowledge derived from the environment is being structured. One example of knowledge transfer in the combination mode is customer relationship management. Educations systems are examples of knowledge combination at a national level.

A complex knowledge management tool is used by KPMG. It is called KWorld and is routinely used by consultants. KWorld provides access to a wide variety of resources accumulated by others in the company, including detailed company information, existing and prospective client information, completed and ongoing projects, a knowledge library offering tools which may be helpful in projects, and internal information on the current performance of the company and individual departments[17].

Another global corporation, Citibank, has a less extensive intranet than KPMG. It is used more as a convenient support tool designed to facilitate the use of stored knowledge that a specialised and critical consultancy support tool. The intranet stores useful information which facilitates day-to-day operations such as location data on employees, current events at the bank or customer care manuals. Unlike KWorld, it is not an extensive knowledge management support tool because the bank does not offer consulting services which are strongly reliant on the unique knowledge of consultants. The Citibank internal system is called "Source" and is a typical corporate intranet solution designed to provide a 'one-stop-shop' for certain information available to staff. Source is used as a typical knowledge transfer tool by departments directly responsible for customer service. Source provides them with key information on the next steps. Monitoring and planning departments of the retail bank communicate with customer service departments via Source. Further, the system stores training resources, latest product terms and conditions and up-to-date product descriptions. Being less targeted than KWorld, Source is nonetheless considered to be perfectly aligned with the needs of a banking institution.

### 3.4 Internalisation

Internalisation means performing the job-related tasks according to policy, job description, management decisions. In this process, formal knowledge is converted into tacit knowledge thus leading to the growth of the tacit knowledge resource. Internalisation is building up a resource of tacit knowledge based on formal knowledge, then using the knowledge in practice and transferring it from the organisation to individual level. The creative process is driven by a continuous, dynamic and simultaneous interaction between explicit and tacit knowledge.

Internalisation involves permanently integrating knowledge units generated in the three other processes into the tacit knowledge resource, i.e. 'learning by doing'. Internalisation is a process of converting explicit knowledge into tacit knowledge by which tacit knowledge becomes a strategic resource. Once internalised, knowledge becomes part of the organisation's knowledge resource. This process can be seen as a natural consequence of the preceding processes in the knowledge spiral.

Internalisation is supported by verbalisation or documenting or orally transmitting knowledge. This makes knowledge easier to absorb and transfer to others. Internalisation yields operational and strategic knowledge, the latter being instrumental for new projects, business development and expansion. Internalisation is further strengthened by the absorption of the experience of others. The process of building up 'tacit knowledge' in the minds of individual employees is supported by verbalisation, documenting or transmitting the history of the organisation by word of mouth. If by reading and hearing about the past experiences of the organisation its members can relate to them as something meaningful such experiences may be converted into tacit knowledge. It is often enough to listen to others tell their story of a project to feel a strong urge to follow their example. Documents and files help members of the organisation who have not participated in a specific project, decision-making process or implementation to experience indirectly that other experienced directly. Internalisation is supported by learning

[17] Ibidem, p. 89.

on the job – knowledge needs to be put to a practical test in order to be internalised effectively.

**External experts at AstraZeneca**

J. Roth, a Swedish researcher, conducted a study on knowledge creation and sharing in the pharmaceutical company AstraZeneca[18]. The company implemented such a large number of research projects that the busy project teams could not find the time or apply any methods for sharing their knowledge with others. The Management decided to hire external experts to help the company improve its knowledge creation and sharing system.

The key responsibility of the experts was to identify processes and tools which could contribute to a more efficient transfer of knowledge in the organisation. Internal experts asked to solve this problem were highly experienced both in terms of the technical knowledge and working with teams. This was important because it was meant as a confidence builder with the team to prevent resistance to change or the 'not invented here' syndrome. There were three steps in the knowledge creation process.

**Step I.** Experts become established and endorsed and gather project facts. Experts interview the Project Manager to learn more about the project and identify which activities the PM believes to be important and which pose a challenge. The objective of the interview is to extract additional knowledge which will be useful in the following project phases.

**Step II.** Tacit knowledge is released and explicit knowledge becomes structured. A series of brainstorming sessions held with the project team members resulting in the 'knowledge on the wall' or ideas recorded on the flipchart. Following the brainstorm, another session held to structure the tacit knowledge released in the brainstorm and to disseminate it as generally available knowledge. The time between sessions allocated to team members' reflection on the developed ideas with the intention to add new ideas which were 'missed' in the brainstorm. The role of experts limited to facilitation. Team members' role limited to involvement in discussion. The output of this step was a collection of mind maps of explicit knowledge accumulated from all meetings and inputs to the final presentation. Experts rotated their roles of facilitators and record keepers.

**Step III.** Knowledge shared with the rest of the organisation by presenting the knowledge generated in project team meetings at an interactive seminar. Most of the seminar designed to address concerns and comments resulting from experiences other than those of the project team. The role of experts was limited to facilitation.

Summing up, J. Roth identified the following roles played by experts during the project:

- catalysts of knowledge creation - in the absence of any knowledge sharing system, they were the individuals who helped build such a system more rapidly,
- co-ordinators of knowledge sharing initiatives - they put together a process leading to a series of meetings between people from completely different departments and orchestrated knowledge sharing,
- organisation's knowledge guides - they helped create a vision of the organisation and integrated the process of knowledge creation in various different areas,
- confidence builders - they created an atmosphere of mutual trust in the project team,
- promoters of the knowledge sharing culture.

Roth emphases the need to differentiate the roles of experts and team members. The expert as an outsider had much less specialised knowledge than team members who were in fact the knowledge carriers at AstraZeneca. The main responsibility of the expert was only to help extract the tacit knowledge and streamline the process of knowledge creation. This would not, however, be successful without the knowledge of the project team members.

The approach of I. Nonaka and H. Takeuchi is comprehensive and covers not only learning and knowledge creation processes but also addresses the organisational context and environments which are conducive to knowledge acquisition and processing. The business strategy of a business organisation must specify the type of knowledge which will be critical for the organisation and where and when it will be applied. Knowledge creation in an organisation requires the involvement of people and the fundamental values of the organisation must be shared and accepted by its members. An unconventional approach to working

[18] J. Roth - *Enabling Knowledge Creation: Learning from an R&D Organization* [in] Journal of Knowledge Management, 2003, Vol. 7, No. 1, s. 32-48.

conditions, independence, recognition of creativity and out-of-the-box thinking are characteristics of many business organisations which are considered highly innovative and competitive in their sectors.

If new ideas find easily circulate in the organisation and employees have access to information extending beyond their direct operational needs there are greater chances for brand new solutions to be identified. There are three ways of achieving this: interdepartmental collaboration, competition between project teams and employee turnover.

Knowledge creation and learning are supported by flat and flexible organisation structures where individual segments are interconnected through an information network[19]. This virtually allows equal access to information and well informed units may work together with others in an emergency situation. Many companies have started implementing their knowledge management systems by deploying an intranet.

## 4 Conclusion

Knowledge management is a process used by an organisation to generate wealth based on its intellectual or knowledge-based internal assets: people, brands, image, employees' personal knowledge, intellectual property, and knowledge-related structures such as databanks, technologies, and internal and external relationships. While knowledge management has become a necessity today it offers no panacea for all the challenges faced by contemporary business. It is merely a perfect tool which helps improve operations in an increasingly competitive and turbulent environment[20].

Organisations which manage their knowledge are characterised by ongoing processes of customisation, customerisation and industry convergence, all of which are highly desirable in the present competitive environment. Customisation is a process by which an organisation can use its expertise to make products to individual customers' orders. It derives the knowledge directly from buyers who can communicate their expectations and product needs via a structured communication network linking them to the company. Customerisation is a combination of operational and marking customisation. The enterprise is capable of individual dialogue with each customer and responding to their feedback by adjusting its products and services and ensuring a one-to-one communication[21].

Industry convergence means the gradual disappearance of borders between sectors or even industries. For example, pharmaceutical companies have until recently been classified as part of the chemical industry. Today, they are involved in biogenic and biotechnological research to develop new drugs, cosmetics (called cosmeceuticals) or foodstuffs. The Walt Disney Company still produces films but makes profit on gifts, theme parks, store chains, hotel chains and cruise trips[22]. There are plenty of other examples. Notably, organisations that pursue such strategies have to compile knowledge from different fields, must be 'learning organisations' and have what the Japanese call the SECI Model.

In their theory of organisational learning and knowledge creation, I. Nonaka and H. Takeuchi seem to express a belief in the inherent human capacity to generate knowledge and thus change the reality. This derives from the Japanese cultural heritage: Buddhism, Confucianism and philosophical naturalism, which are the source of such characteristics of the Japanese as creativity, energy and vitality. They lead to the core of knowledge being the source of life and call for a continuous study of knowledge. This is also manifested in the martial arts practiced in Japan for centuries. Yet, the Japanese approach to knowledge management appears to wholly behavioural. It focuses on human behaviours in an organisation and on the human nature. An effective transfer, acquisition and sharing of knowledge in an organisation are possible only if interpersonal relations and intra and intergroup interactions are effective and people are united by common goals, interests and problems to be solved.

In order to address multiple management challenges, business organisations of today have to ensure an adequate understanding of knowledge and an environment for sharing knowledge via efficient communication channels, formalisation of knowledge based on available tools and informational technology. Knowledge management usually requires changes to corporate culture and the development of a knowledge culture which is expressed by organisation's the ability to learn, build its own identity, inspire confidence and foster individual and group creativity.

[19] Ibidem, p. 109.

[20] G. Gierszewska - *Zarządzanie wiedzą w przedsiębiorstwie* (Knowledge Management in an Organisation), Publishing House of the Warsaw University of Technology, Warsaw 2011.

[21] Ph. Kotler - *Marketing*. Rebis, Poznań 2005, p. 37.

[22] Ibidem, p. 38.

Paradoxically, businesses are in need of new knowledge as it provides them with building blocks for innovation but knowledge creation is a challenging task because creativity is something that is fostered rather than managed.

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