

## SECI MODEL AND FACILITATION IN CHANGE MANAGEMENT IN METALLURGICAL ENTERPRISE

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Organisational change management is not efficient without gaining and sharing knowledge by the members of the enterprise. Both in the conditions of relative organisational stability and in organisational chaos resulting from dynamic introduction and management of changes there is a constant need of improvement and of shaping competences and distribution of knowledge in the enterprise. The publication presents key programs of building knowledge conducted in a metallurgical enterprise.

*Key words:* SECI model, knowledge management, metallurgical enterprise

### INTRODUCTION

Organisational change should be defined as the difference “between the condition (in time  $t_1$ ) and other condition (in time  $t_2$ ) in management, business processes and the social area of the enterprise without pointing out its potential and real outcomes”. Change is the result of action which often has the form of process. It may be caused by internal or external impulse and refer to any area of the enterprise. It created a new condition with potentially better order and better organisation which shapes a new paradigm of working [1]. Studies in the field of ecology show that survival of an organism depends on its learning pace. If it is equal or higher than the speed of changes in the surrounding of that organism it has the chance to survive. But if the level of learning is lower than the dynamics of occurring changes then the organism dies [2]. This rule presents the organism (system) of an enterprise really well. If the changes are more dynamic than the possibilities of the enterprise, it will not survive on the turbulent market. That is why the enterprises should maintain such system and organisation method which will provide development and constant learning in order to monitor the changes in the surrounding and to take actions which modify the internal organisational order.

### MODEL SECI

SECI Model (Socialization, Externalization, Combination, Internalization) was first presented by I. Nonaka in 1991 [3]. It is a model of system type gaining and sharing knowledge [4-7] (Figure 1).

K. Grzybowska, Poznan University of Technology, Faculty of Engineering Management, Poznan, Poland  
B. Gajzik, The Silesian University of Technology, Faculty of Materials Science and Metallurgy, Katowice, Poland

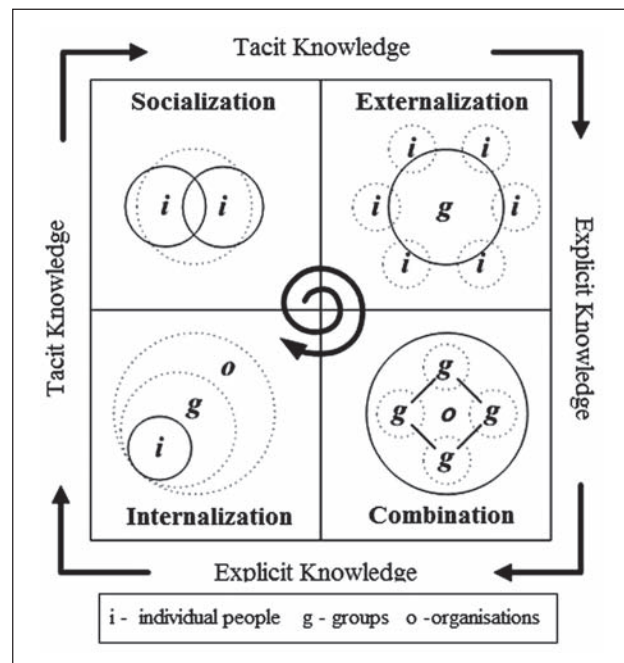


Figure 1 Model SECI [4]

SECI Model includes symbols “i”, “g”, “o”, which represent respectively: individual people, groups and organisations (enterprises). This model correctly presents the conversion of knowledge in the process of introducing organisational changes. The core behavioural assumption in the model is that knowledge creating companies continually encourage the flow of knowledge between individuals and staff groups to improve both tacit and explicit knowledge stocks [5].

Knowledge creation is a spiral process which allows for 4 types of knowledge conversion by:

- 1) **socialisation** – is based on gaining knowledge by individual people – sharing the knowledge, specific experiences, cognitive models and patterns of behaviour which are in force in a given

group on the basis of face to face rule, there is a passing from individual to group hidden knowledge,

- 2) **externalisation (self-expression)** – is going from hidden knowledge to formal knowledge by transferring and formulating the hidden knowledge; such formalisation results from the exchange and sharing of the individual knowledge within a group, it is going from group formal knowledge to group formal knowledge within many groups,
- 3) **combination** – is based on joining new and existing fragmentary elements of formal knowledge between various groups, a transition from formal knowledge to systematic formal knowledge occurs,
- 4) **internalisation** – based on acceptance of the imposed knowledge as your own (including the attitudes, opinions and norms); there is a transition from formal knowledge to hidden knowledge; as a result of internalisation of heteronymous norms (which are set by individuals and which do not apply to them, i.e. the obligation of external authority or the authority of superior) the norms are transformed into autonomic norms (which are set by individuals who impose on themselves a certain type of behaviour which does not need to be externally controlled). Internalisation is thus an important mechanism of gaining and sharing knowledge within one enterprise or even the whole supply chain.

Nissen [8] developed the knowledge flows model for the organizational knowledge dynamics. This new concept represents more than just a metaphor; it explains the phenomenon of how knowledge moves through an organization. Harsh [9] reiterates that Nonaka does not consider the fact that a significant part of the initial knowledge is flowing through the cycle many times, which actually means that there is a kind of reusable knowledge. Bratianu and Andriessen [10] analyzing the metaphor *knowledge as energy* showed new opportunities for understanding knowledge dynamics [11].

However, one should be aware that the element which is often neglected but which is very important in knowledge management (also in the process of organisational changes) is facilitation that is motivation which allows directing and using the potential and the possessed resources of knowledge in action. The basic tasks of knowledge management in the processes of introducing and managing organisational change are, among other: identifying, gaining, sharing and applying the intangible resource which is knowledge.

## METHODS OF GAINING AND SHARING KNOWLEDGE

Potential of the enterprises which are future – and constant development oriented is cumulated in the possessed intellectual capital – in the knowledge of the

members of enterprise [12]. Individual potential of employees is built by: lecture – traditional method, individual gaining of knowledge, concurrent learning, collaborative learning. Mentioned methods of gaining and sharing knowledge were described.

**Lecture – traditional method.** It is a method which is characterised by unidirectional flow of information. It is surely a method of education (it concentrates though on the cognitive aspect), but it is not a method of raising qualifications. A lecture does not concentrate on the behavioural aspect – the abilities and on the motivation aspect – the attitudes. During the process of gaining knowledge with the use of traditional method the communication goes from the leader of the lecture towards the recipient (the listener). Due to the passive attitude of the recipients of the statements, the lecture conducted in a traditional way is not an efficient method and, as research shows, it does not influence the development of abilities and specific attitudes of the recipients [13].

**Individual gaining of knowledge.** The process of learning may be based also on individual gaining of knowledge, for example: individual reading, individual solving of problems and gaining knowledge through individual experience. Own searching of knowledge and self-education is a result of the influence of internal and external need which may refer to any human activity and appear at any moment in life. It becomes also the basic strategy of lifelong learning and the key competence of the society of knowledge in 21st century (society based on knowledge, enterprise based on knowledge). The effects of the persistence in self-education are: development of creative disposition, self-discipline, perseverance and development dynamics with its full exploitation.

**Concurrent Learning.** Learning in this category allows for gaining knowledge individually being in a group at the same time (self-education in a group). The typical aspects of such cooperation and learning model are interactions of project groups. Therefore, it is learning of an individual within the meetings and interaction with other participants of the meeting or the group. Concurrent learning is a popular form of gaining knowledge in case of quality circles, improvement groups concerning processes which are conducted in the enterprise and so on. These are also knowledge completion courses organised in the enterprise, Internet sessions of studies and communities focused on career development and social life who “meet” on trade or specialised forums closed for other members of the community. Concurrent learning is also learning through execution of tasks assigned within conducted professional work (i.e. projects). It is one of the methods of support in creation of own development and making lifetime plans.

**Collaborative Learning (CL)** describes a situation where there is a connection between learning units. It should be underlined here that this relationship is predictable and requires the positive coexistence and big responsibility (each unit contributes to education of others and individually gains knowledge and learns things).

The advantage of learning through co-operation is active exchange of thoughts, most often in small groups, which increases the interest among participants and favours critical thinking. Critical thinking here should be understood as convergent thinking which is based on problem solving and analysis of the existing phenomena in order to lead to achievement of specific conclusions. As a result of learning through co-operation the participants are also activated to creative thinking which is also called divergent thinking. Creative thinking aids formulation of new ideas together with joining and modifying the existing ones. The core of creative thinking is the novelty. Such way of thinking is a supplement of critical thinking. Learning through cooperation is not a new idea. It seems probable that people have been learning informally in groups for thousands of years. It was noticed by, among others: L. Vygotski [14], who is considered the precursor of the development cognitive stream. Learning through cooperation includes some significant elements such as: positive correlation, face to face interaction, acting in groups and interpersonal abilities. It also gives the chance to meet the participants of the group and strengthens the bonds between them.

### KNOWLEDGE MANAGEMENT PROGRAM IN METALLURGICAL ENTERPRISE

The enterprise which implemented the program of knowledge management on the metallurgical market is ArcelorMittal Poland ArcelorMittal Poland enterprise within the *Knowledge Management Program* – KMP agreed upon the following slogan: “*knowledge means success*”. The idea of the program is gathering knowledge, its exchange and implementation. The components of *Knowledge Management Program* in ArcelorMittal Poland are: system of educating managers, the so-called *Academy of Managers*, system of employee trainings, system of e-learning trainings, and program of experience and knowledge exchange. *Academy of Managers* program has been working since August 2006.

There are three topic groups within the program: first builds the attitude and the values of managerial staff, second enables the staff to gain managerial abilities by taking part in courses in the following fields: results management, managing through leadership, personal efficiency, leadership in a team; third type of abilities is the group of professional abilities learned during training: art of presentation, innovative and analytic thinking, dealing with stress, making decisions and solving problems, rights at work, job interviews, production costs management, lean manufacturing, value chain management, project management, commercial negotiations, management of the sales process, techniques of leading business talks, motivating and delegating the powers, solving conflicts and difficult situations in the company, business communication, building cooperation in a team and assessment of employee as well as change management. Managerial staff is required

not only to possess metallurgical and technological knowledge but also knowledge concerning modern methods of management and work organisation. The cycle of trainings lasts one year and the managers of all levels in an organisation take part in it. From 2008 to the end of 2012 a group of 1025 people took part in training [15]. The enterprise also implements a program of In-service training. Trainings for workers take place systematically and include the following topics: safety and hygiene of work, system of customer service, operation of facilities maintenance devices, rules of computer systems functioning, up-to-date legal regulations concerning i.e. environmental protection. Within the system of staff improvement (*International Corporate Training and Development Program*) there are also on-line trainings in offer (e-learning). Next program is *Talent Academy* which was initiated in December 2009 [16]. In this project new workers will gain specialised expert knowledge in the field of metallurgy. This form of staff development allows workers to ask questions directly to experts and get to know the process of production. *Talent Academy* is conducted within 3 programs:

- “got talent” – (in Polish based on the word Steel)
  - directed towards looking for outstanding workers,
- “We base on the quality” – series of trainings in the topic of quality,
- „*Outplacement*” – allows the people to look for a new job.

*Academy of Steel* has been functioning since 2011. The aim of this program is conveying knowledge by the experienced workers to workers with less experience and who have worked in the company shorter (mentoring). Topic range of such knowledge exchange comprises technical and technological issues in the areas of: coke, blast-furnace, steel-making, rolling of long products and rolling of flat products. Additionally: environment protection, controlling and power engineering. In the enterprise there are also activities of *crossing* type which are based on the rule in which the employees on identical work posts perform the same work but in other departments (branches) of the enterprise. There is also the exchange of knowledge. The exchange of knowledge takes place during an annual meeting (two to three weeks days long) in different branches of the corporation, which has an international form.

In a big, global enterprise like ArcelorMittal there are often the same problems in various branches of it and despite the fact they are similar they are solved differently. The so-called “golden mean” is applied to do something quicker and cheaper. The topic range of the meetings is very differentiated: from supply through production, distribution, trade, marketing up to recycling. During the meetings various issues are discussed such as: applied staff solutions, organisational, legal, financial issues, methods of management and technologies of manufacturing. Since October 2008 there “*Twinning Project*” has been functioning in the enterprise based on

experiences and knowledge exchange between identical or similar branches of the enterprise. Transfer of knowledge in the enterprise is possible due to the well-functioning system of communication. The enterprise uses the internal network *Intranet*. Besides the internal meeting within the experience exchange there are also meetings with scientists and expert from outside the enterprise. The range of activities within gaining and exchanging knowledge is very broad. In this publication only some of the key programs conducted in ArcelorMittal are presented [16].

## CONCLUSION

In the analysed enterprise there are all the components of SECI network model which were discussed in the theoretical part of it. Knowledge is gained both by individuals and by members of groups and the whole managerial staff. In the process of knowledge transfer the company bases both on new staff in the program “got talent” and the employees who are experienced (mentoring and program 50+). There are many forms of gathering, transferring and application of knowledge.

## REFERENCES:

- [1] Grzybowska K.: Reorganizacja przedsiębiorstw. Zarządzanie zmianą organizacyjną, (The reorganization of enterprises. Managing organizational change) Politechnika Poznańska, Poznań (2010)
- [2] Pedler M.: Action Learning in practice, Hampshire, Gower Publishing Ltd., (1997).
- [3] Nonaka I.: The Knowledge Creating Company, Harvard Business Review, November-December, (1991), 96-104.
- [4] Nonaka I., Takeuchi H.: The knowledge-creating company, New York - Oxford, Oxford University Press, (1995)
- [5] Rice J.L., Rice B.S.: The applicability of the seci model to multiorganisational endeavours: an integrative review, International Journal of Organisational Behaviour, 9 (2003) 8, 671-682.
- [6] Nonaka I., Toyama R., Konno N.: SECI, Ba and leadership. A unified model of dynamic knowledge creation', Long Range Planning, 33, (2000), 5-34
- [7] Nonaka I., Toyoma R.: Why do firms differ? The theory of knowledge-creating firm, Knowledge creation and management. New challenges for managers, (eds.) Ichijo K., Nonaka I., Oxford University Press, Oxford, (2007), 13-32
- [8] Nissen M.E.: Harnessing knowledge dynamics. Principled organizational knowing & learning, IRM Press, Hershey (2006)
- [9] Harsh O.K.: Three dimensional know-ledge management and explicit know-ledge reuse, Journal of Knowledge Management Practice, 10 (2009) 2, 1-10
- [10] Bratianu C., Andriessen D.: Know-ledge as energy: a metaphorical analysis, Proceedings of the 9<sup>th</sup> European Conference on Knowledge Management, Southampton Solent University, 4-5 September (2008),75-82, Academic Publishing, Reading
- [11] Bratianu C.: A Critical Analysis of Nonaka's Model of Knowledge Dynamics, Electronic Journal of Knowledge Management, 8 (2010) 2, 193 –200.
- [12] Ganz W.: Das Management von Wachstum und Erfolg, Stuttgart, IRB Verlag (2001)
- [13] Silberman M., Auerbach C.: Metody aktywizujące w szkoleniach, Kraków, Oficyna Ekonomiczna, (2004)
- [14] Vygotsky L. S., Mind in Society: The development of higher psychological processes, Cambridge, MA, Harvard University Press (1978)
- [15] Gajdzik B.: Wybrane zagadnienia z rozwoju wiedzy w przedsiębiorstwie hutniczym, (Selected problems of the knowledge development in steel enterprises), Hutnik - Wiadomości Hutnicze, 72 (2005) 11, 557- 561
- [16] Gajdzik B.: Przedsiębiorstwo hutnicze po restrukturyzacji. Dynamika zmian w krajowym sektorze hutniczym w latach 1992-2010, (A metallurgical plant after restructuring. Dynamics of changes in domestic metallurgical sector in 1992-2010), Politechnika Śląska, Gliwice (2012), 219-230.

**Note:** The responsible translator for English language is D. Grachal, Katowice, Poland