W. SROKA, J. CYGLER, B. GAJDZIK

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KNOWLEDGE TRANSFER IN NETWORKS – THE CASE OF STEEL ENTEPRISES IN POLAND

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The paper describes the problems of knowledge transfer in networks based on the steel industry in Poland. Knowledge is the key element in the development of a company's competitiveness. This is particularly important in the case of networking, where there is a process of mutual learning between partners. Based on the example of Arcelor-Mittal Group, the transfer of knowledge within an intra-organizational network was presented.

Key words: steel, enterprise, knowledge transfer, network

INTRODUCTION

Knowledge is the key element in the development of a company's competitiveness. In a changing environment, the company is able to maintain its competitive position if it constantly generates knowledge and disseminates this knowledge within the organization and transforms it into new competences [1]. This thesis is particularly important in the case of cooperation in networks, as they are an excellent opportunity for mutual learning between partners. Therefore one can state that the ability to transfer knowledge becomes one of the key factors in improving the competitive position of the company.

THE CONCEPT OF KNOWLEDGE IN THE LITERATURE

Knowledge is a key resource, whose transferability determines the time at which the holder can reap profits from it. If an enterprise wants to improve its competitiveness it has to acquire new competences obtained through cooperation. This process is based on the concept of the learning organization, i.e. the internal organization which facilitates the acquisition of experience and learning [2]. Organizational knowledge can be divided into explicit knowledge, which is to say knowledge which can be codified; and tacit knowledge which is hidden and difficult to indicate. No difficulties are usually encountered in the transfer of codified knowledge, but its value for the organization is lower than for tacit knowledge. Although hidden knowledge is extremely beneficial for the company, it is also very difficult to transfer it to partners within a network. The main reason is the fact that understanding and explanation requires a significant period of time, and therefore slows down the development of new products or production competences. Prior to the establishment of cooperation within networks, each company has a certain amount of internal knowledge which is self-generated. It includes information related to products and/or services, markets served, as well as relationships in the specific environment. When cooperation commences, the partners gain access to their resources, such as information about the structure of the market, technology, know-how etc. This layer of knowledge is known as environmental knowledge. The next layer of knowledge which is grouped around environmental knowledge is known as virtual knowledge. It defines the way in which environmental knowledge is acquired and then converted into internal knowledge. It includes knowledge which is considered to be desirable within the organisation. In case of access to tacit knowledge, the matter of trust between the partners becomes especially important [3]. The other important factors are: the strength of the relationship between partners, and the competence of the source transmitting information. Cooperative relationships with competitors constitute a potential alternative to the generation of internal knowledge. Networks between companies are an effective way to create a competitive advantage through a combination of the complementary resources of network members [4]. Exchange of knowledge enables companies to acquire and accumulate new skills and competences and thus to respond more quickly to changes in the business environment [5].

GUIDELINES FOR KNOWLEDGE TRANSFER WITHIN THE NETWORK

Knowledge transfer in an intra-organizational network is a highly complex process. It is determined by

W. Sroka, Academy of Business in Dąbrowa Górnic-za, Faculty of Management, Informatics & Social Sciences, Poland
J. Cygler, Warsaw School of Economics, Collegium of Management and Finance, Poland
B. Gajdzik, The Silesian University of Technology in Gliwice, Faculty of Materials Science and Metallurgy, Poland

many factors, including: the structure of the network; the specificity of partners; and the absorptive capacity of the recipients of knowledge in the network and the ability and capacity of the broadcasters to disseminate knowledge. The character of the knowledge transferred and the structure of programs of knowledge transfer implemented by the individual companies are also regarded as important factors. The network structure significantly affects the quality and process of knowledge transfer in the network. Research conducted by W. Tsai [6] confirmed that companies occupying a central position in intra organizational network are characterized by greater innovation, as a result of better and wider access to knowledge. They generate more packages of knowledge than the other participants of the network. The quality and speed of knowledge transfer in an intra-organizational network depends on the multiplicity of organizational units which are of key importance to the network, and which have direct access to the sources of knowledge, as well as a lot of relationships with other members of the network. The more such units there are, the quicker the transfer of knowledge [7]. M.T. Hansen also noted that stronger relationships within an intra-organizational network favour the transfer of complex knowledge, while weaker ties prefer the transfer of simple knowledge [8]. B. Uzzi's research has shown, however, that the frequency of contacts between the parties positively affects the quality and speed of this process. The communication channels between network members are thereby strengthened, and therefore involvement in the transfer of knowledge between them increases [9]. Absorption is a key factor in the success of knowledge transfers in the network. W.M. Cohen & J. A. Levinthal define it as "an ability to recognize the value of new information, assimilate it, and apply it to commercial ends" [10]. It is claimed that companies with greater absorption are better able to acquire, transfer and commercialize the obtained knowledge. As a result, members of an intra-organizational network characterized by significant absorption have higher innovativeness (product, market, process, and organizational). The problem of readiness for the transfer of knowledge within an intra-organizational network may depend on many factors, one of which is the nature of the relationship between the sender and the recipient of knowledge transferred. In recent years, one has been able to observe the intensification of the coopetition phenomenon in intra-organizational networks. Depending on the nature of the coopetitive relationship between the sender and the recipient of knowledge, its willingness to transfer knowledge will be diversified. The tendency to transfer will be greater, if the coopetition between the parties is of a pro-cooperative nature (meaning the domination of co-operative streams over competitive streams) [11]. Another factor influencing the quality of knowledge transfer is its nature: explicit knowledge and tacit knowledge [12]. Explicit knowledge can be characterized by quantitative and qualitative standards. It is formal and systematic knowledge and therefore it is easier to transfer and absorb. In turn, tacit knowledge is informal and intuitive. Tacit knowledge is difficult to express through formal means of expression and communication. One needs to feel it, to experience it, and observe it. The transfer of tacit knowledge is not unique, and its effects are neither clear nor abrupt. However, this type of knowledge is also considered as a basis for the creation of competitive advantage, especially in the resource concept of the enterprise [13]. The factors limiting the transfer of knowledge include: its complexity; ambiguity of interpretation; and novelty. The knowledge transferred is more complex, which makes the process more difficult. Knowledge transfer in an intra-organizational network has to be carried out according to certain procedures and rules. Each network needs to develop its own solutions (programs) in this area, depending on the specific network members, transferred knowledge and strategic policy. The knowledge management programs of the individual members of the network should create the best conditions for the development of knowledge transfer across the entire network. Knowledge transfer programs also include the training of senders and recipients of information. R. Reagan & B. McEvily emphasize that knowledge transfer is much faster and better when the parties involved in the cooperation processes are similarly trained and educated (e.g, engineers, mathematicians, computer scientists, physicists) [14]. This is made possible through the adoption of rules and procedures. The programs of knowledge management limit the level of competition in network relations, reduce opportunistic behaviour, increase mutual trust, and build a network of cooperation as well as strengthen the organizational culture of the network. As a result, it improves the efficiency of knowledge transfer and the functionality of the entire network. Knowledge transfer programs should be characterized by considerable flexibility (which changes depending on the nature and needs of individual members of the network).

THE CHAIN OF KNOWLEDGE TRANSFER IN AN INTRA-ORGANIZATIONAL NETWORK

In the prevailing conditions of economic globalization and the consolidation of capital groups, knowledge transfer is gaining more and more recognition among managers. Previous methods of managing business processes, which were not based on the exchange of knowledge, seem to be insufficient. The production enterprises, aiming to fulfil orders in the shortest time and customer service at the highest level, have to provide managers and employees with fast and unlimited access to knowledge. Information systems (Intranet, Extranet) and public (Internet) are of key importance. Packages of knowledge are developed and subsequently communicated among enterprises within the network. The authors tried to order them for the purpose of this paper,

taking two main directions of knowledge transfer: within the capital group (between departments, subsidiaries, and divisions of the corporation); and between the enterprises in the network. The case study was based on the steel industry. We analysed the assumptions of knowledge management programs in the ArcelorMittal Group. The basis for the development of objectives of knowledge transfer were four blocks of actions (operations): analysis, strategy, implementation and improvement (development) [15]. These blocks were compared with the basic resource areas of the network members, dividing them into primary and secondary processes. An additional category which was specified for the purpose of this paper was intellectual capital, which, in the light of current social and economic change, was considered to be the key to the proper functioning of the business. The structure of the intellectual capital of the enterprise consists of human capital, i.e. knowledge, abilities and skills of employees to perform tasks efficiently [16]; and structural capital, i.e. investments of the enterprise in systems and tools facilitating the flow of knowledge within the organization and in network relations [17]. The structure of the transfer of knowledge within the enterprise can be presented in the form of a model of dependency of actions (Figure 1). At the stage of analysis, the enterprise sets the business needs in the context of knowledge transfer, with particular emphasis on the employees' requirements for training and professional development. In turn, at the stage of developing a strategy, special attention is paid to the integration activities of individual business units within the corporation. Finally, the stage of implementation is combined with the conversion of individual strategic assumptions into concrete actions in order to obtain measurable effects of knowledge transfer. The last stage is a continuous process of improvement of knowledge transfer in the enterprise. In companies focused on knowledge, employees strive for the acquisition and utilization of knowledge to carry out their tasks, as well as for original solutions to improve the functioning of the company [18].

The knowledge gained by the employee becomes the innovation potential of the enterprise. Assuming that individual enterprises cooperate with each other in a network of both business and non-business relationships, one obtains a chain of knowledge transfer. The specificity of the knowledge chain is the exchange of knowledge between enterprises, taking into account the intensity and extent of the contacts between the organizations. When creating a network of knowledge transfer, one should determine whether connections are used in the best possible way, and whether the network gives the particular members access to additional intellectual competence.

KNOWLEDGE TRANSFER IN PRACTICE

ArcelorMittal was presented in this paper as the case study. The Group implemented the assumptions of knowledge transfer internally (ArcelorMittal Knowledge Management Program). A key component of the program is the participation of managerial staff in the "Manager Academy". The project is part of the Global Development Executive Program. It is assumed that executives gain new analytical, interpersonal, managerial, as well as leadership skills, which should inspire them to make changes at different levels of the corporate hierarchy. Lower-level employees can use the knowledge available through the system of human resources development (International Corporate Training and Development Program) via the Intranet and the Internet. ArcelorMittal implemented an e-learning program in which employees have access to, inter alia, the Global English Service (http://www.globalenglish.com), enabling them to learn English; Online Training Center (OTC) Thomson NETg (http://www. netglearning.com) which functions as the training centre for the following departments: accounting and finance, customer service, human resource management, sales, marketing, project management; Business Book Review - literature thematically linked to the production processes; and Steel University, i.e. an English-language dictionary containing vocabulary specific to the steel industry. Another important component of the program is the exchange of knowledge and experience amongst the employees of the corporation as a whole. It is worth adding that such a knowledge exchange relates to both the senior management level and individual employees, as a part of the 'crossing' process. Crossing means that employees in identical positions perform the same tasks in other divisions of the corporation. This paper, however, does not cover all components of the Knowledge Management Program implemented by ArcelorMittal. More information and data are available in the thematic papers in Metalurgija [19].

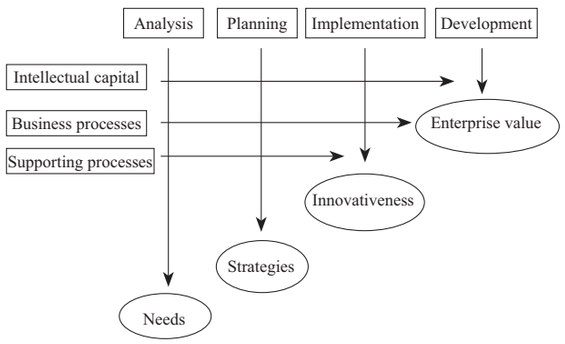

Figure 1 Knowledge in enterprise

CONCLUSIONS

Members of the intra organizational network, their specificity, the type of knowledge transferred, distribution channels of knowledge and programs of knowledge transfer create a system of knowledge transfer within a network. The quality of this system depends on its individual components. A properly designed transfer sys-

tem is a prerequisite for effective knowledge transfer in an intra organizational network, which generates competitive advantage. The transfer of knowledge between companies in the network is more difficult than in the case of individual companies. This is mainly because of the type of knowledge transferred, the size of the network, coordination of knowledge transfer skills, etc. It is also worth emphasizing that networking is a form of access to the potential of the knowledge of other companies, thereby supporting the more intensive use of existing knowledge in their own companies. This also positively affects the achievement of competitive advantage. Companies gain in two ways: on the one hand, through access to the resources and skills of the partners, and on the other hand – by using knowledge in an optimal way in their own company.

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