

## QUALIFICATIONS VERSUS USEFUL KNOWLEDGE IN METALLURGICAL ENTERPRISE

Received – Prispjelo: 2013-01-24  
Accepted – Prihvaćeno: 2013-05-10  
Review paper – Pregledni rad

The article presents notions connected with resource structure of useful knowledge packages in metallurgical enterprise. Dependence between building competence of employees and using knowledge for the need of better efficiency of the enterprise was discussed here. ArcelorMittal Poland enterprise served as case study here due to the fact that it strives at World Class Management by putting emphasis on bringing areas of business activity to perfection through participation and involvement of employees.

*Key words:* metallurgical, enterprise, employees' competence, knowledge, organizational development

### INTRODUCTION

Knowledge had been the topic of consideration of specialists in economy for a long time but it was not earlier than in the end of the last century than they started studies and empirical tests in order to create a concept of system called knowledge management. Knowledge is necessary to act effectively – in small scale of individual performance as well as in a scale of groups of people [1]. The role of knowledge became more important in enterprises due to dynamics of changes in the environment (globalisation of the market, increase of competition, processes of integration of enterprises, development of information technology techniques, etc.) 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 [2]. It is assumed that knowledge is the power which constructs the market and is the source of competitive advantage of the enterprises. The basic aim of modern enterprises is creation of useful knowledge which is such knowledge that is used in the process of improving the components of the enterprise and in increasing the efficiency of functioning of an enterprise. Useful knowledge means value increase of products, services, processes, systems. The experience of many companies shows that the application of actions which are based on elimination of wasting and application of continuous improvement may in the long run bring significant benefits [3]. And at the same time makes the value of the whole enterprise become higher. Knowledge is the key resource of enterprises and in order to

form it both internal and external sources of its transfer are used. Harsh [4] reiterates 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. This publication is limited only to the internal methods of gathering knowledge through actions helping in the development of employees' competence which are verified in the context of improvements in efficiency of functioning of an enterprise. Metallurgical enterprise ArcelorMittal Poland was used as the case study here.

### QUALIFICATIONS OF EMPLOYEES VERSUS USEFUL KNOWLEDGE

In general approach, competence means accordance of qualifications with performed job and they are identified as the responsibility of the worker for the conducted tasks. Competence is the range of the authorisations, responsibilities and duties assigned to a given work post [5]. Competence is defining the ability to perform work on a given post. Employees' competence must be useful in order to accomplish aims and tasks of the enterprise. Structure of competence of employees remains in interaction with range of conducted tasks in an enterprise. Those dependencies are bilateral; together with the change of tasks the competence changes and the opposite: new competences form the new range of tasks. Scientific discussions concerning competence of the employees are constantly in progress [6,7]. Their importance in enterprises increases because they are the main element of enterprise development [8]. „Each enterprise in the end is cumulated knowledge of former and present employees” [9]. Quoted statement should be completed with the knowledge that is useful for the enterprise. Each enterprise is therefore the effect of the useful knowledge of the former and the present employees. Useful knowledge means better efficiency of function-

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

ing in an enterprise. As a result, knowledge of the resources are shaped: the skills and attitudes desirable and necessary in a given context (eg level of commitment and initiative). Also increases the potential of the employee. Knowledge acquisition allows for the training of staff competence hard (referred to as the threshold requirements for a given position). P. Drucker suggests that investing in “human productivity” [10] becomes a chance for companies of the 21st century. P. Drucker defines knowledge as “efficient use of information in action” [10]. On the basis of this definition the authors approve the dependence between increasing competence of employees and the efficiency of the use of knowledge in action and in functioning of enterprises. On the basis of literature analysis it was concluded that competence may be either identified as the useful knowledge or not due to the fact that the notion of knowledge is very broad. Despite the presence of constant gaps between employees’ qualifications and useful knowledge the authors assumed that, in a nutshell, the qualifications of employees should equal useful knowledge. The range of such knowledge is assigned to knowledge workers (the term knowledge workers appeared in the late 70s of the last century (P. Drucker, 1969) but gained popularity twenty years later (P. Drucker, 1999) [10]. According to estimated data the knowledge workers constitute 20 to 40 % of all the employed in the companies.

## SCHEMES OF USEFUL KNOWLEDGE RESOURCES IN METALLURGICAL ENTERPRISE

Each enterprise creates its own knowledge resources which are specific due to conducted actions and functions on the market. Manufacturing enterprises should possess knowledge resources necessary to conduct basic tasks within the course of technological cycle. Resources of useful knowledge in manufacturing enterprises may be divided into three categories: 1. Knowledge about manufacturing processes, 2. Knowledge about products, 3. Knowledge about management systems [11]. Within each of the categories there is further specification of knowledge packages (Figure 1). In the category of knowledge about manufacturing processes there is a division into basic and supplementary knowledge. In the basic category there are [12]: metallurgical knowledge (knowledge on metallurgical processes), technical knowledge (construction of machinery and equipment; technical specification and parameters of equipment; operating conditions and technical limitations), technological knowledge (terms of use of technologies; information about emerging technologies, new technologies), knowledge of Chemistry and Physics (physical and chemical reactions in metallurgical processes). Supplementary category is the knowledge about manufacturing system, including knowledge about devices (their productivity and norms of technological parameters), knowledge about work posts (range

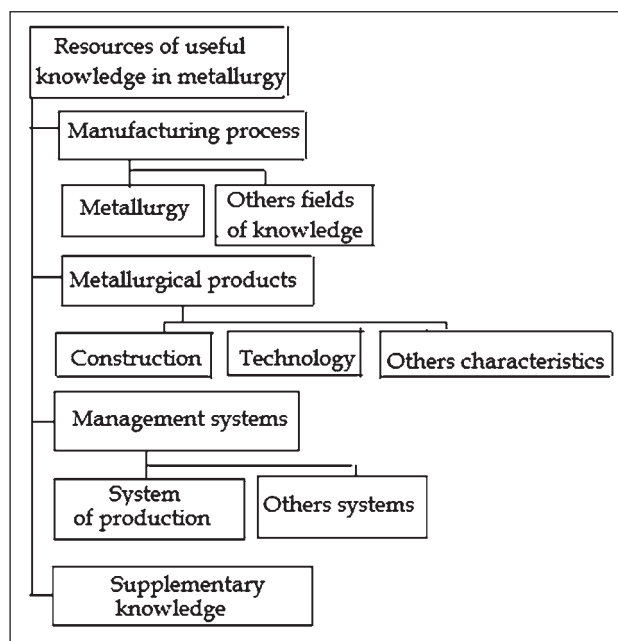


Figure 1 Resources of useful knowledge in manufacturing enterprises

of responsibilities on each work post, relationships between posts, dependence of posts etc), knowledge about appliances and tools for work (their application and use) and used computer and IT software (most commonly SAP) [15].

Another category of knowledge is knowledge about metallurgical products. Applying the division into basic and supplementary knowledge it was stated that in the basic knowledge category there is construction characteristics and technological characteristics of the products, plan and schedule of production and in category of supplementary knowledge (specialised one) there are: knowledge about services accompanying a given product, knowledge about the market and marketing knowledge (all market phenomena favouring the company or not - opportunities and threats - and customer behaviour in the market, customer behaviour motives, customer characteristics, needs and expectations, marketing efficiency, certification of the products) [13]. The last category of knowledge is the knowledge about management system in an enterprise. In its basic category there are: structural knowledge (structure of the company, division into branches, departments, sections, units, mutual relations and rules of co-operation), management knowledge (management techniques and methods allowing for adequate use of the company’s potential and external conditions), accounting and financial knowledge (financial analytical skills, controlling and accounting rules) [12]. In the category of supplementary knowledge there are: psychological and social knowledge (operation of a unit, group, organisation; mutual interactions between employees; human behaviour rules; employee selection rules in relation to particular functions - psychological tests) [12]. In the category of knowledge about management systems there are also packages of knowledge on quality management, envi-

ronment management and job safety management. Category of knowledge about management systems should be supplemented by packages of knowledge concerning support of computer and IT management (metallurgical enterprises use SAP software). The categories of knowledge presented in this paper do not include all the possible resources of knowledge available in a metallurgical enterprise but serve as an attempt to arrange the knowledge in some order and to categorise it.

### **BUILDING USEFUL KNOWLEDGE IN A METALLURGICAL ENTERPRISE**

The biggest metallurgical company on the Polish market is ArcelorMittal with 10 000 employees. The company introduced its Knowledge Management Programme (KMP) based on the motto "Knowledge means success". An important element of the programme is the Manager Academy operating under so-called Knowledge University. The Manager's Academy programme was prepared in April 2006. Effects of 5 editions of the programme were: 6 438 trainings per participants, 461 trainings, 927 training days [13]. Management staff of the enterprise during general and specialised training gains the following knowledge packages: management by objectives, management by leadership, project management, decision making in difficult managerial situations, organizational change, functioning of teams, effective management as well as managerial skills, for example: managing employees, effective motivating, solving problems, analytical thinking, effective coaching, and team leadership. During training the business awareness of the managerial staff is also being constructed. Examples of the trainings with priority meaning for ArcelorMittal enterprise are training courses on the topic of job safety. The importance of those courses results from the policy of accident-free production applied by the capital group. Example trainings: subjects realized in 2011: 1. Fatality prevention standards, participants: social labour inspectors (100 participants), 2. Work at heights, participants: specialists on working at height (777 participants), 3. Analytical thinking, participants: ambassadors of OH&S (Occupational Health and Safety), social inspectors for the OH&S, trainers of OH&S, (200 participants), 4. First aid, participants: production employees, (818 participants), 5. Standards of OH&S for contractors, participants: contractors performing services for ArcelorMittal Poland (6 522 participants), 6. OH&S for coordinators (354 participants) [13]. Packages of useful knowledge gained by employees during trainings include both general knowledge about functioning of Safety Management System as well as detailed knowledge about job risk on each of the posts and rules of job safety. The enterprise also conducts a program called Talent Academy. Programme was inaugurated in November 2009. The project assumes two editions (130 employees of the ArcelorMittal Poland). Talent Academy is realized by two develop-

ment paths, one is addressed to young engineers and second to the mentors. In order to gain new employees the enterprise conducts an educational program called "Install yourself" addressed to students of technical universities. Within three editions 800 members were recruited. Details are particular editions: Edition 1 (2008/2009): 13 meetings in the high school, 16 club meetings, 4 trainings of soft skills, 60 participants of English language course, 17 scholarship holders (trips to London), 500 websites visits (daily), 24 newsletters, 500 club members, 34 ambassadors. Edition 2 (2009/2010): 17 meetings in the high school, 13 club meetings, 9 trainings of soft skills, 60 participants of English language course, 8 scholarship holders (trips to London), 700 websites visits (daily), 36 newsletters, 850 club members, 26 ambassadors. Edition 3 (2010/2011): 17 meetings in the high school, 15 club meetings, 5 trainings of soft skills, 60 participants of English language course, 4 scholarship holders (trips to London), 800 websites visits (daily), 36 newsletters, 800 club members, 17 ambassadors of ArcelorMittal Poland [13]. Besides the mentioned programs the analysed metallurgical enterprise conducts trainings on the following topics: stages of production, improvement of back-up functions, provision of quality standards, modern techniques of work organisation and many other topic ranges. These are both obligatory trainings, usually in a given time period and additional trainings which help the enterprise achieve bigger efficiency and rational management of all the resources. The management policy implemented in the enterprise is directed towards looking for saving and cost reduction as well as activities which improve the course of work and processes so far. Only in 2010 savings of 19 EUR per one produced tone of steel were gained and in the branch in Świętochłowice 287 tons of zinc were saved, which means 112 000 EUR in Q4 of 2012. Enterprise ArcelorMittal Poland strives at achieving World Class Manufacturing by improvements in the efficiency of functioning [14]. On the example of the pillars of WCM, the example potential areas of savings were used by reducing the costs of business activity which would mean higher efficiency. First pillar – work safety – is the decrease of accidents frequency, smaller number of standstills, and drop in the number of post-accident absences, etc. Second pillar – cost development – raw materials and time savings achieved by better organisation of work including Lean Management, Lean Production, 5S as well as participation and increase of involvement of employees in making the organisation of work perfect. Third pillar - focused improvement – decrease of costs achieved by constant development – Kaizen philosophy and innovativeness. Fourth pillar - autonomous maintenance – is the elimination of the unexpected shutdowns of devices, decrease of breakdowns of devices and improvement of quality of functioning. Fifth pillar - professional maintenance – it is the decrease of cost by constant monitoring of the efficiency of devices. Sixth

pillar – people development – is the increase of efficiency of training by adjustment of topics, forms and methods of presenting knowledge to the needs of participants. Seventh pillar – early equipment management – means preventing the breakdowns of the devices, planned exchange of devices, technological competition, etc. Eighth pillar – product quality – is the application of standards and quality control methods allowed for reduction of cost of returning the faulty products or ones which did not match requirements of the customers and first and foremost positively influenced the reputation of the company on the market. Ninth pillar – customer service – is the unification of the procedure and standards of customer service, information about trade offer (open and for general use), effective communication network and other activities allowed to reduce the costs of maintenance and service. Tenth pillar – environment and social responsibility – is higher ecological efficiency by conducted technological investments, systems of ecological management (ISO 14001, strategy of preventing the creation of pollution and the positive ecological and social image of the enterprise (ArcelorMittal has been taking part in Social Responsibility since 2007).

## CONCLUSIONS

The publication presents the key component of useful knowledge for a metallurgical enterprise and an attempt to determine the dependencies of building the useful knowledge through qualifications of employees. The main argument proposed in this paper was to be confirmed by the range of trainings and amount of knowledge acquired by employees of ArcelorMittal Poland enterprise. In the analysed metallurgical enterprise knowledge workers actively participate in improving efficiency of its functioning which is the key assumption in conduction of requirements of World Class Manufacturing.

## REFERENCES

- [1] Myszewski J.M., On Nonaka's dynamics of knowledge management, *Research in Logistics & Production*, 3 (2013) 1, 59-70.
- [2] Grzybowska K., Gajdzik B.: SECI model and facilitation in change management in metallurgical enterprise, *Metalurgija*, 52 (2013) 2, 275-278.
- [3] Grzybowska K., Gajdzik B.: Optymisation of equipment setup processes in enterprises, *Metalurgija*, 51 (2012) 4, 563-566.
- [4] Harsh O.K.: Three dimensional knowledge management and explicit knowledge reuse, *Journal of Knowledge Management Practice*, 10 (2), (2009), 1-10.
- [5] Šmid W.: *Leksykon menedżera, Słownik angielsko-polski*, Profesjonalna Szkoła Biznesu, Kraków (2000)160.
- [6] Delamare Le Deist F., Winterton J.: What is competence, *Human Resources Development International*, 8 (2005), 1, 40.
- [7] Davenport T. H.: *Thinking for a Living. How to get better performance and results from knowledge workers*, Harvard Business School Press, Boston-Massachusetts (2005), 10, 22.
- [8] Armstrong M.: *Human Resource Management*, translation A. Unterschuetz and others, Oficyna Ekonomiczna, Dom Wydawniczy ABC, Kraków (2001) 241-242.
- [9] Obłój K.: *Strategia sukcesu firmy*, PWE, Warszawa (2000)
- [10] Drucker P. F.: *Knowledge –Worker Productivity. The Biggest Challenge*, *California Management Review*, 41(1999) 2, 79.
- [11] *Inspired by: Paszek A.: Analiza procesów tworzenia kapitału intelektualnego w przedsiębiorstwach produkcyjnych*, Conference KZZ, Zakopane (2009) 307.
- [12] Gajdzik B.: Concentration on knowledge and change management at the metallurgical company, *Metalurgija* 47 (2008) 2, 142-144.
- [13] Report 2011 ArcelorMittal Poland Corporate Responsibility, (2012) 18, 26, 31.
- [14] Gajdzik B.: World Class Manufacturing in metallurgical enterprise, *Metalurgija* 52(2013) 1,131-134.

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