

POSSIBILITIES OF THE INNOMET SYSTEM FOR HUMAN RESOURCES DEVELOPMENT IN ENTERPRISES

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Abstract

The primary objective of this INNOMET project and the INNOMET tool as such is to increase the responsiveness of education institutions to business demands and to improve the access of vocational and higher educated specialists into labour market. For that purpose it is proposed to introduce an integrated virtual database system for educational and industrial needs in the sector, which includes the database comprising of existing educational opportunities, e.g. different levels of study programmes, as well as mapping of the industrial needs for human resources based on the employee qualification standards. Elaborated INNOMET database serves as a dynamic and constantly up-dated study on human resources in the sector. Companies will be motivated to renew information in certain periods, as INNOMET tool can be effectively used for companies' own human resources evaluation and development. The system can also be made use of in the development of trans-national skills' passports in Europe.

Keywords: *human resource management, advisory system, database*

1. INTRODUCTION

Productivity, i.e. obtained output from current input (e.g. amount of manufactured production per month, monthly turnover per employee) has become one of the most important markers of competitive ability. Productivity depends upon rational and effective use of existing resources (equipment, staff, technologies, facilities, communication systems, knowledge).

The term 'enterprise' can be defined as an organisational structure, where on the basis of existing resources transformation process is conducted. During this process raw products are changed on the acceptable quality level into final goods and services. Hereby, subdivisions belonging into the organisational structure play a decisive role in this transformation process. One can say that every business unit must know its operational tasks and intrinsic activity or inactivity should not obstruct other functional units of enterprise in performing their specified tasks accurately and conscientiously. From aforementioned postulates comes out also leading, responsible and executive role of a human being.

In Estonian metalworking and machinery the main weaknesses of the sector are lack of highly qualified workers, low co-operation between companies, and absence of clear national and international cooperation networks. Although the sector has lack of qualified labour force, Estonia has too high rate of unemployed people (12 %), so improvement of

existing educational system as well as re-training and improved qualification award system and cooperation is needed. Only after mapping the current situation in an enterprise and answering to the question "What we have?" is possible to move on to the key question of next stage "What we want to know?", turning to the training programmes mapped by educational institutions.

Enterprises and trade unions are interested in certain vocational standards and specifying skills level of employees. Academic world and vocational education providers cannot react to these changes correspondingly without knowing the real needs of industry world. Hence the gap between the needs and reality of labour force structure and quality exists. By stimulating contacts and cooperation between the different factors both in business and educational systems, synergies can be successfully achieved to realise the abovementioned main criteria.

INNOMET is an acronym for a project which aims is to develop an innovative database model for adding innovation capacity of labour force and entrepreneurs of the metal engineering, machinery and apparatus sector. Project is funded by the European Commission Leonardo da Vinci II programme during the period of 2003-2004.

This project focuses on a new monitoring tool ensuring qualified labour force for enterprises in the machinery, metal engineering and apparatus sector in terms of local and European needs.

The primary objective of this INNOMET project and the INNOMET tool as such is to increase the responsiveness of education institutions to business demands and to improve the access of vocational and higher educated specialists into labour market. For that purpose it is proposed to introduce an integrated virtual database system for educational and industrial needs in the sector, which includes links to existing educational opportunities, e.g. different levels of study programmes, as well as private sector qualified labour force and mapping of the industrial needs for human resources.

The main objective of the INNOMET system therefore is to supply enterprises and educational institutions with the updated information related to the needs, structure and qualification as well as about the opportunities of finding/ requesting needed courses.

An important step towards this goal is to define and understand the needs for the manufacturing industry for training and education in manufacturing education on global. Regularly updated data by enterprises and educational institutions will contribute to the development of a time based information system as supporting environment by everyday business planning concerning human resources. This will also give companies the opportunity and benefit to upgrade employees within the latest courses of manufacturing and management based on global industry needs and with the state of the art of educational methodologies. As a reward the educational organisations will have a possibility to predict future needs by using information

feeds from variety of enterprises (Innomet Marketing Report, 2004).

At the macro level, the improvement of the human resource will result in national gain, and at the micro level businesses and enterprises will benefit from better trained workforce and knowledge transferral (Peacock 2002).

When in INNOMET project has been raised a problem, created a concept and proposed a solution based on the elaborated software for human resources development, then in current paper aims representing main aspects for human resources development in enterprises.

2. ASPECTS OF HUMAN RESOURCES DEVELOPMENT

Productivity is development basis of human resources in enterprise. In equal conditions (product, machine tool, operating environment) one manufacturer can be three times more productive than another. Why it is so? What could be the reason?

The answer of this question lies hidden in employee's existing:

- knowledge;
- skills;
- experience;
- personal qualities;
- motivation factors.

Development, monitoring and making consequences of aforementioned criteria are the main merits of human resources development in enterprise (see Fig. 1).

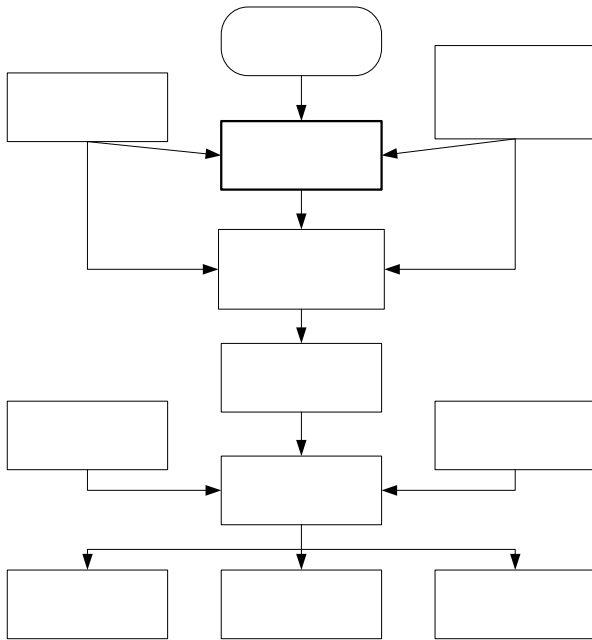


Fig. 1 Development of human resources in enterprise

Qualification standards are the basis for evaluation of labour force qualification (in terms of resources). Application of social resource is shown on Fig. 2. The qualification standard stands here as the criterion of skills, knowledge and personal qualities of social (human) resources.

Vocation	Fields of skills			
	General skills	Basic skills	Extra skills	Personal qualities
Machine tool operator				
EDM operator				
Fitter				
Welder				
Mechatronic worker				
Foreman				
Industrial engineer				
Designer				
Production manager				
Business manager				

◆ →
 ◆ →

Fig. 2 General evaluation of human resources in enterprise

On the assumption of particularity of every organisation or enterprise the core component for human resources development (see Fig. 1, Fig. 3) is the skills card.

2A. OPERATOR	SPECIFICATION: MACHINE TOOL OPERATOR	
Competence/ Skills	VT (0-5)	PT (0-5)
2.1 General skills		
2A.1.1 General skills of profession	5	4
2A.1.2 Management and economy	4	3
.....		
2A.2 Basic skills		
2A.2.1 Knowledge of specific materials	5	4
2A.2.2 Skills of reading technical drawings	4	3
.....
2A.3. Extra skills		
2A.3.1 Selection of working tools	4	4
2A.3.2 Knowledge of manufacturing technologies	4	4
.....
2A.4 Personal qualities		
2A.4.1 Sense of duty	5	4
2A.4.2 Precision and punctuality	5	3
.....

Fig. 3 Skills card

Skills/knowledge to be evaluated are grouped according to professional standards. A professional standard is a paper, defining requirements due to professional qualification for knowledge, skills, experience, values and personal qualities. Professional standard acts as:

- specification of labour force qualification requirements;

- basis of elaboration curricula and educational programmes for educational organisations;
- basis for elaboration vocational exams as well as certification and evaluation of professional qualification;
- means for creating basis for comparison of international qualification certificates.

In practice prescription of professional requirements is substantial. Professional requirements are divided into four groups beginning with more general skills and ending with specific personal qualities essential for working at the profession. General principles of professional requirements are as follows (see Fig. 3):

- general skills – requirements originating from economic affairs for general skills and knowledge;
- basic skills – special professional requirements for skills and knowledge;
- extra skills - special professional requirements for skills and knowledge, characterised in narrow specialisation and/or necessity for executing additional assignments at current position;
- personal qualities –expected personal identities and abilities required by current profession.

Definition of specific skills/knowledge depends on field of activity of enterprise. The definition process should be started in every particular case from job descriptions of a current enterprise.

Evaluation of skills/knowledge is the next step towards human resources development in enterprise. For assessment a scale of grades [0...5] is used. The lowest grade is “1” and highest “5”. Grade “0” is used in case when the corresponding skill is not relevant. Both required (VT) and existing (PT) level has to be evaluated. Analysis can be performed in term of vocations as shown on Fig. 4.

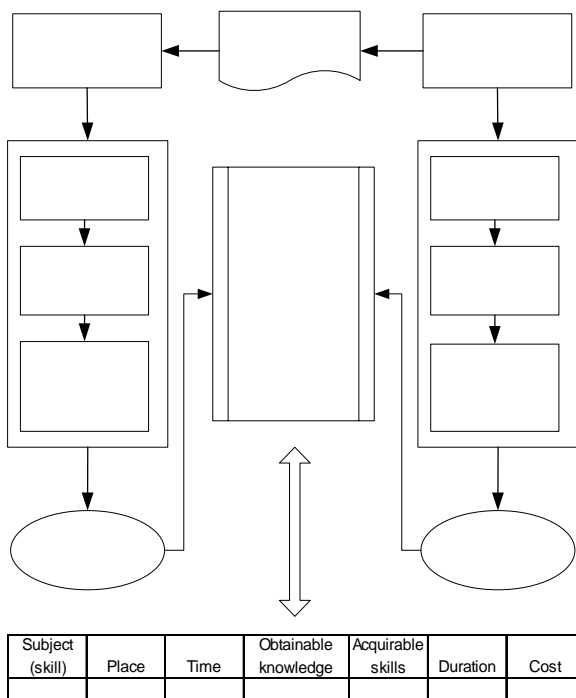


Fig. 4 INNOMET process

INNOMET will play significant role in the framework of engineering education management process. How the situation in the environment of the engineering activities

(business process, supply of skilled employees, engineering education) looks like?

Companies try to find skilled employees to fulfil their strategy. From the other side the study programmes reflect the competency of particular educational institution. Hence there are missing coherent activities between industry and academic world. Real situation should be as follows.

In companies one should do all defined by the list of skills related to particular job on the needed qualification level.

In educational institutions student after passing the course „should know“ the subject (passive skills) and „should do“ related to the subject (active skills).

Sum of active skills of the programme should match to the lowest set of skills by the related qualification standard.

So, the corrected education concept as competency based education is introduced (Papstel, 2004).

3. CONCLUSIONS AND FURTHER ACTIVITIES

The current solution is focused on the sector of metalworking, machinery and apparatus engineering. It is capable for monitoring quality and quantity of human resources in every participating organisation of the network.

The described methodology of human resources development has been tested properly in five organisations. The enterprises where testing was performed have been various by their type: machinery, tools engineering, metal engineering and road engineering. The fifth organisation was Tallinn University of Technology.

Testing results turned to be successful and elaborated system has proved its place as a carrier of competence development.

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