System Management Competencies Job Applicants with Use of IT Tool "System Professionals"

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Abstract. The paper introduces an IT tool ‘System Professionals’ which supports managing the competencies of job applicants. This tool streamlines the information exchange between labor market and vocational training. It was created as a result of cooperation between the Wielkopolska Province Government and Poznan University of Technology. The users of the tool were defined and the needs which reflected basic functionalities were characterized. Additionally, the most important elements which were the subject of the system design process were indicated.

Introduction

The growing belief in the importance of managing competencies of employees in order to effectively reach targets makes competencies essential resources of the enterprise [3]. Understanding employees’ competencies as a resource that can be measured, developed and improved makes it possible to manage competencies similarly to other resources of the enterprise [17].

The development of the level of an employee’s competencies can start much earlier, even in a vocational school. Monitoring workstations facilitates the recognition of detailed tasks, which in turn enables an objective description of knowledge, skills and attitudes of future task performers. Cooperation between an enterprise and a vocational school may lead to changes in the school curriculum so that they meet the requirements regarding competencies in given workstations [20].

The goal of this paper is to present an IT tool, which aims at connecting the labour market and education in Wielkopolska, as well as matching competencies with workstations. The IT solution, ‘System Professionals’, developed, implemented and improved under the project ‘Time for Professionals – vocational training in Wielkopolska’, and now developed in the second stage of the project – ‘Time for Professionals BIS – vocational Wielkopolska’, facilitates a detailed examination of the needs of entrepreneurs from the Wielkopolska region regarding employees’ competencies, and confronts them with the skills of potential employees.

It Tool Supporting the Management of Competencies of Job Applicants

The basic product of an innovative project ‘Wielkopolska System of Monitoring and Forecasting’, realised in 2010-2012, was to create an IT tool that would enable employers in
Wielkopolska to make offers of jobs, internships and apprenticeships. Students and graduates of technical schools could use it to describe their own competencies profile.

The analysis of educational effects in a given school/university and their comparison with the requirements of given workstations is the first stage of managing competencies of students in a given specialisation. It resulted in creating a Matrix of Vocational Competencies (Matryca Kompetencji Zawodowych – MKZ) of students in given specialisations [18]. It is a detailed list of knowledge and technical and social skills for given specialisations, in accordance with the school curriculum and employers’ requirements, necessary to perform tasks. Figure 1 shows the scheme for developing MKZ.

In technical schools, both secondary and tertiary, syllabuses following the curriculum were created. They include educational outcomes, i.e. the set of knowledge, vocational skills and personal and social competencies that every student is supposed to have on finishing education in a given profession [14]. The analysis of educational outcomes in all subjects for a given profession will lead to a competencies profile of a job applicant in a given profession. On the other hand, every organisation has requirements for individual workstations [13]. The analysis of tasks realised in given workstations may lead to creating a competencies profile required by a given organisation [15]. If knowledge, skills and syllabuses are described with the same code, it is possible to compare these two tools. Modification of the competencies profile of the job applicant based on the organisation’s requirements will lead to creating a Matrix of Vocational Competencies in a given profession, in accordance with the syllabus and the employer’s requirements, MKTS - Matrix of Technical and Social Competencies (fig. 1).

Figure 1. Design scheme of matrix of vocational competencies of job applicants in a given professional specialisation. Own elaboration based on Spychała M., etapy zarządzania kompetencjami studentów politechniki poznańskiej, in: I. Werner, E. Więcek-Janka (ed.), przedsiębiorczość i zarządzanie, pomiędzy zarządzaniem procesami edukacyjnymi a rynkiem pracy. vol. xv, book 8 part 2, 2014, pp.127-138.
Employers describe required skills in given workstations, using a dictionary based on the syllabus of vocational training (*Podstawa programowa kształcenia w zawodach, Rozporządzenie Ministra Edukacji Narodowej z dnia 7 lutego 2012 r. w sprawie Podstawy programowej kształcenia w zawodach, 25.02.2013, available in the Internet: http://isap.sejm.gov.pl/DetailsServlet?id=WDU20120000184.*). The use of tree structure of a dictionary where a profession includes qualifications, competencies and skills, enables a very detailed description of competencies requirements for an employee or a workstation [9].

Knowing the scope of competencies required by employers currently and in the future, job applicants (especially students) may develop given skills within the framework of syllabus. Examining competencies of a job applicant and comparing them with MKZ, a competencies gap will be defined for each applicant, i.e., a lack of knowledge and skills in given areas. Based on this information, a plan of development and improvement of competencies gap will be created [17].

The most effective adjustment of young people to the needs of a job market is realised within the framework of market vocational training, based on individual professional path or a dual system of vocational training. In Poland a school model of vocational training is realised, where the curriculum plays the main role, frequently disconnected from vocational practice. The relationship between education and the job market should be initiated and supported by local authorities [1]. It is necessary to create development plans within the triad of school, business, and administration. This kind of solutions is developed under the programme called Technical Knowledge Accelerator (Akcelerator Wiedzy Technicznej® AWT®) [21] and realised in projects such as ‘Time for Professionals – Vocational training in Wielkopolska’ or ‘Time for Professionals BIS – Vocational Wielkopolska’. One of the tasks of the above-mentioned projects is the establishment of steady connections between schools and local employers for the cooperation in adjusting syllabuses to the job market, and also in using the potential of employers to make resources available for the education of staff.

Information has the key role in the proposed system. It is up-to-date and detailed information that is missed by all subjects connected with education, business and administration [19]. School and university should know employers’ current and future needs for certain competencies – both professional and social. The decision to maintain, call or cancel individual professional profiles should be based on a thorough diagnosis of the needs of the job market, and demographic analyses, often of migration trends. It should also consider development plans and expectations of the region. Students, while planning their education path, should take into consideration their professional career, which requires information on the needs of the job market and directions of economic development. Entrepreneurs look for information about employment possibilities, and descriptions of the potential of future staff should be detailed and thorough, thus enabling planning of staff management. Descriptions of job offers available should be parallel to the characteristic of respective workstations. In the categories of managing a business – from the perspective of an employer, an employee is a set of competencies which will affect the realisation of the goals of the enterprises. Such an approach to recruitment requires the use of certain formulations and information transfer in IT systems connecting entrepreneurs with potential employees [16].

Each functionality of the System Professionals was designed and adjusted in connection with users, taking into consideration their individual needs and mutual information relationships, in
accordance with the methodology of developing IT systems [22]. Cooperation of numerous subjects, often of various types, is the basis and success of innovation [10].

Development of Time for Professionals IT system

Market assumptions of a useful tool, possible to commercialise after a period of implementation and improvement were taken for the design of System Professionals. When designing functionalities of the IT tool – System Professionals – user requirements were carefully defined. This stage determined further steps and included a specification of essential requirements from the perspective of system utility. At this stage it was indispensable to carry out a survey among employers, students, teachers and representatives of local authorities. The survey included a focus group interview (FGI) and numerous individual consultations. It was important to recognise mechanisms and sources of searching for information by entrepreneurs [11] and to know the structure of information, especially in the area of expected competencies of employees. This stage also included the feasibility study, consisting in defining possibilities, time and cost of realisation of the enterprise.

The second stage was creation of the IT tool. This stage followed the standard methodology of IT systems [5, 8] and included an analysis of requirements concerning functionalities, technical conditions, legal stipulations, sensitive data protection and protection against unauthorised access. Further actions included the development of database structures, the choice of software technology, programming style and the source code. Integration process and testing concluded this stage. Due to the necessity of adjusting the tool to user expectations and a short term of the project realisation, testing was done as action research [12].

The last stage of the development of the IT system was the use, maintenance and modification, and improvement resulting from user expectations. Continuous development of the IT tool requires co-relation of user requirements with technical possibilities and system requirements of the project – as in many commercial solutions, the system needed to be adequate and flexible at the same time [2].

Improvement of the system had to include user requirements connected with managing information about employee competencies, therefore focus group interviews were carried out among entrepreneurs, concerning their needs. System improvement also referred to optimisation of data structure, improvement of algorithms and requirements related to mobile access to data [6]. The need to keep up with the development of expectations and IT possibilities forced new integrating methods, stimulating and improving the use of the system, therefore agent concept [7] or Marketing Automation solution were used.

Basic functionalities of Time for Professionals IT tool

System Professionals is a tool used by several groups of users. The core of the System is information connection of student/graduate with the employer. Further groups cooperate with these users – students and head teachers, managers of vocational training and career counsellors. All of them are supported by a group of users – training institutions. All users use a uniform interface, which consists of a navigation bar on top of the screen with links to other pages forming the System Professionals.

What is important, System Professionals can be used for managing information about employee competencies, facilitated by the standardisation of job descriptions and job
applications of candidates. All groups of users of System Professionals use a uniform dictionary describing professional competencies, which is based on the curriculum of vocational training.

System Professionals, realising attributed functions, collects a lot of data about user activity and information entered by them about competencies they have on the one hand, and those which are expected on the other. It enables a synthetic and detailed analysis of both supply and demand for professional competencies in the job market in Wielkopolska. In response to the needs of users and realising standards of mobile communication [4], job offers and applications relate to certain geographical locations.

Summary

System Professionals IT tool presented in this paper aims at solving in a systematic and innovative way the problem of communication between subjects of the job market and the system of vocational training. The goal of ‘System Professionals’ is to create own, clear descriptions of qualifications which will facilitate the comparison of knowledge and skills obtained during formal education, and to better adapt them to the needs of the job market. This system gives the possibility to compare knowledge, professional skills, thus to recognise what a candidate knows and can do. Managing information about student competencies (competencies profiles of vocational school students) and employee competencies (competencies profiles of employers) is an exceptional task of this tool. Based on Matrix of Vocational Competencies, research is carried out verifying the method and analysing the needs of employers in Wielkopolska. Among 1300 businesses registered in System Professionals, those which employ the biggest number of employees in the most typical professions for the region are chosen (e.g. IT specialists, sellers, mechatronic technicians, mechanics). Verification of this method and conclusions of the research are used to create reports on actual – market-related requirements for employee competencies. Solutions such as System Professionals help manage competencies of future and current employees, and thus increase effectiveness and efficiency of the recruitment process, employment, and staff development. Universal character, replicability, free access, systemness are essential qualities of System Professionals. System Professionals is also a very practical help to better prepare school graduates for the contact with the job market and accelerate adaptation of young employees to new workplaces. System Professional platform, thanks to the module structure, can be flexibly adapted to user needs depending on technological or regional requirements.

References


