

Skill modeling of professional competencies of the E-Business

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Abstract—E-business has changed the interaction between people and production factors, which now requires special competencies (know-how, skills and experience). The problem of the specifications in “digital competencies” is particularly relevant in the system of professional training, leading to the need of answering the main question – what should a specialist, who is focused on active participation in solving the problems of the e-business, need to learn?

Keywords—e-business; digital economy; human resource potential of the digital economy; competencies of the digital economy; applied informatics; skill model.

I. INTRODUCTION

Under the e-business (digital economy) we will define the system of socio-economic relations and production forces based on the use of modern digital information and communication technologies. During the recent years there was an increase in importance of such a system for the entire world economy. The corresponding main development course and milestones in the Russian Federation are designated in the State Program “Digital Economy of the Russian Federation” [1].

E-business is a natural-evolutionary stage of the economic activity system development and it affects all members of society, without exception, and all segments of the population. The role features of various professional specializations in this emerging system do vary widely, from “simple consumption” to “creative technological innovations”. In every case the effectiveness of role-based functioning is provided by different sets of competencies.

There are at least three large groups of specialists actively interacting with e-business that can be distinguished:

- “Creators”, which are directly developing and creating new technologies and new products;

- “Innovators”, which are ensuring the introduction and operation of digital innovations in various areas of economic relations;
- “Users”, which represent the broadest group using the “IT” in various forms of economic relations and in everyday life.

These sets largely overlap one another, but for each of them we can define its specific “digital competencies”. The purpose of this paper is to determine the competencies of “Innovators”, and to answer the question: “What students need to learn for their final qualification meets the challenges of the e-business?”

II. RESEARCH METHODS

This study is based on the analysis of modern professional standards and need for IT specialists, the analysis of publications and scientific discussions on this topic. We also used the methods of observation and comparison based on data obtained from many years of work experience, methods of interviewing representatives of employers and professional communities, university graduates.

III. RESULTS

Recently, the content of the concept “digital competencies” and the mechanisms of the training of e-business personnel key conditions formation have been widely discussed in scientific publications [2][3][4][5][6][7]. In this paper, we will be interested in the competencies of “innovators”, which represent the extremely important group of specialists whose activities are regulated by professional standards “06 – Communications, information and communication technologies” (Fig. 1).

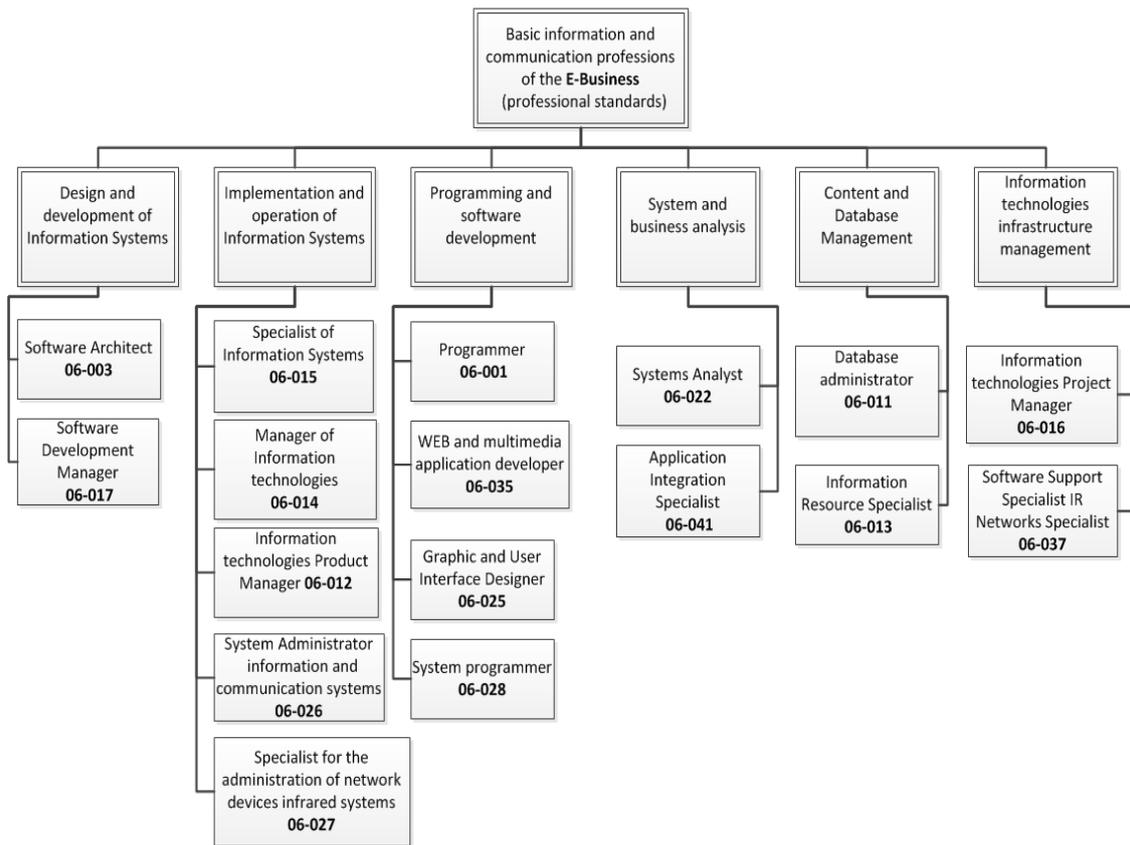


Fig. 1. The tree of innovator's professions. Professional standards representing the human resource potential of the e-business.

Standards developed for ensuring information security, as well as several standards supporting technical solutions in terms of communication, are excluded from the “profession tree” presented here. They are characterized by special competences.

The professions indicated in Fig. 1 are focused on the design, development and implementation of information and communication technologies and related applied practical solutions, which largely determines the success of the operation and development of the digital economy as a whole.

To a large extent, this set of professions corresponds to the directions of professional training in higher education programs “Applied Informatics” (bachelor and master) [8][9]. These programs graduates provide human resource for innovative solutions of the e-business: they apply software products into practice, ensure quality and support the information systems operation, carry out strategic and operational management of important business processes that provide to the real economy informational resources. Therefore, this has considerable practical interest: what should a graduate know? How to maximize compliance with the professional challenges of the e-business?

Our experience in organizing relevant learning processes shows that the requirements specification for learning outcomes and for the qualifying professional level in the form of competencies, which are now adopted in all professional education standards, are not sufficient [10]. Competence, in the context of educational standards, is the

ability (or proven ability) to use knowledge, skills, personal qualities and experience in solving practical problems of a certain type. The main disadvantage of this definition is difficulty in measuring the completion degree of competence. It is possible to manage effectively only what can be measured [11]. Any competence should be complemented by a skill model, which represents an ordered set of skills needed to solve practical problems of a particular type [12]. In this model a skill is an action formed by repetition, characterized by a high degree of mastering and the absence of element-wise conscious regulation and control. Mostly, this refers to the intellectual skill - an inner-automated technique, a method for solving a previously encountered task [13]. Skill, as a unit of planning educational processes, has the following advantages:

- It is well tested by relatively uncomplicated methods (specially planned tests based on real practical problems).
- It always supposes that the baseline knowledge is verifiable. For example, possessing the “Java programming” skill ensures that the specialist has relevant sufficiently extensive knowledge of certain categories. However, the opposite is not always true. Knowledge of Java language does not guarantee practical ability to write programs in a given quality.
- It is well correlated with the basic concepts of professional standards: “worker’s role”, “workers duties” and “necessary skills”, as an example [14] [15].

Skill model in the long-term approach allows to measure professionalism in the “skills” and creates a conceptual basis for creating a promising unified all-Russian digital space “E-business labor market” – a distributed informational resource that allows tracking both the professional evolution of specific specialists and analyzing the human resource needs of individual enterprises and industries.

It is necessary to take into account that it is impossible to simply designate the goal of learning in the separated form of “new technologies”. For example, it is impossible to master the technologies of a distributed registry [16] without

having skills in the field of databases. In addition, the e-business involves continuous improvement of technology, so targeted competencies should be focused on further development and self-development.

The basic new technologies that define the specifics of the e-business are clearly listed in the Program [1]. A skill model that includes skills generated on the basis of “classical” information and communication technologies and implying the possibility of active development in the direction of “digitalization of the economy” is shown in Fig. 2.

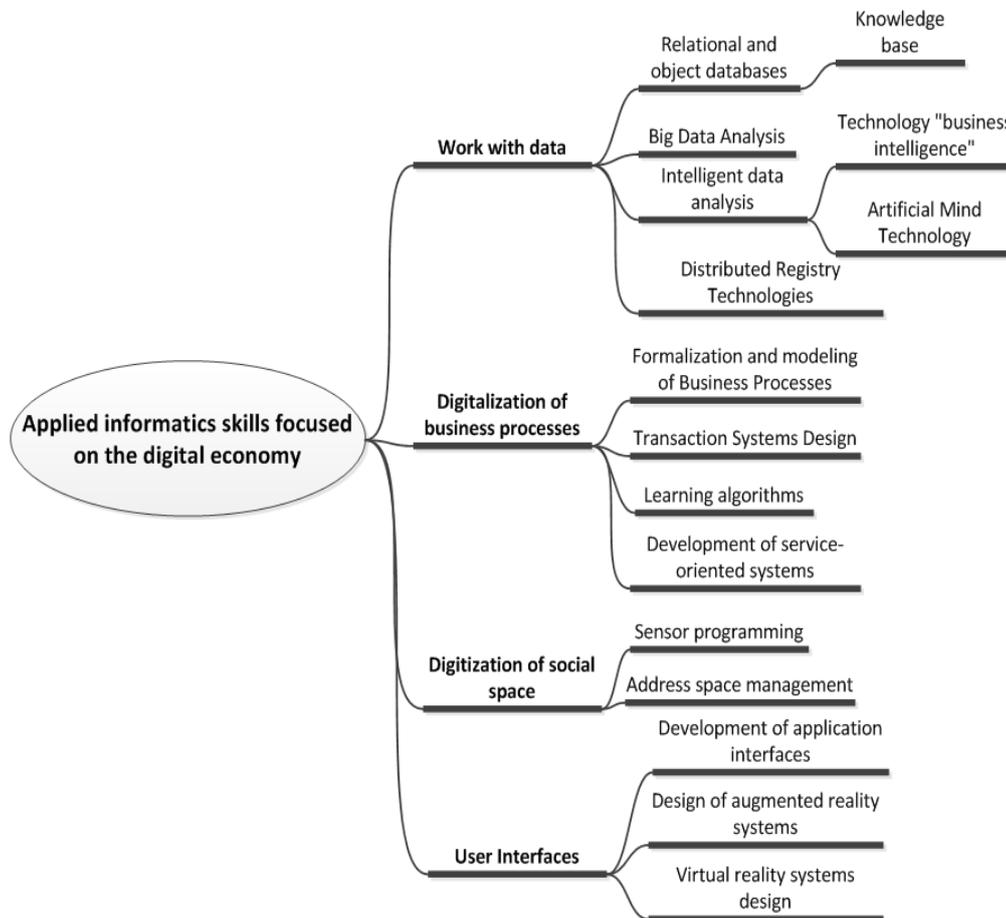


Fig. 2. Target skill model in “innovative” professions of the e-business.

IV. CONCLUSION

In the context of planning educational programs of higher educational institutions, the implementation of a skill model implies an adjustment of program content in most professional education disciplines. The task is to derive “innovative” skills from the “classical” skills smoothly and aligned with the natural trends of technology evolution. The description of an example of such a transitional curriculum organization is beyond the scope of the goals and objectives of this article and will be made by the authors in subsequent publications.

The proposed logic for the development of e-business competencies for specialists in the field of applied informatics is based on the experience of implementing experimental educational programs at Pitirim Sorokin Syktyvkar State University. Specifying the required competencies by describing the target skills and abilities allows to simplify the planning of the educational process and improve the accuracy of the current intermediate educational result control.

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