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TOPICAL ISSUES OF UNIVERSITIES' DISTANCE E-LEARNING SYSTEM SUPPORT

Annotation. The work overviews models by which the system of distance education was developed within the University. Intellectuality of the system consists in learning process personalization and the automatic development of tests according to the certain course.

In terms of information glut and rapid development the annual knowledge growth of a student is about 4-6%, specialist gains up to 50% after graduation. That means that almost the third part of the working time should be spent on the replenishment of professional knowledge. All these leads to extremely high significance of the professional knowledge management and studying support systems development.

Distance education e-learning technology usage is completely different from traditional ways of studying and is mostly based on individual studying by a student. Significant part of teacher's work is handed to computer. Basically educational systems become an expert-teacher and transfers knowledge to the student. Therefore, the main feature of the distance education systems is the ability to establish necessary knowledge sources and gain knowledge individually. The possibility of studying process individualization is one of the main advantages of the application of information technologies.

Everything mentioned above contributes to solving the issue of studying individualization based on methods, technologies and software development for distance education. During the studying process within one subject, adaptive E-learning management model based on Moore's finite-state machine has been implemented. In this case educational process is considered as discrete one which is characterized by certain stable states of information E-system.

Usage of the Tree-Net model components allows personalization of the educational environment which helps to understand the place of the information in the educational plan. It also helps to extend opportunities for individual acquaintance with the subject field of the study.

Keywords: E-learning, distance education, information, information technologies.

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АКТУАЛЬНІ ПИТАННЯ ПІДТРИМКИ СИСТЕМИ ДИСТАНЦІЙНОГО НАВЧАННЯ ВНЗ

Анотація. Розглядаються актуальні питання підтримки системи дистанційного навчання ВНЗ для підвищення ефективності їх функціонування.

Ключові слова: Е-навчання, дистанційна освіта, інформація, інформаційні технології.

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Distance education e-learning technology [1], [2], [3], [4], [5], [6], [7], [8], [9], [10], [11], [12], usage is completely different from traditional ways of studying and is mostly based on individual studying by a student. Significant part of teacher's work is handed to computer. Basically educational systems become an expert-teacher and transfers knowledge to the student. Therefore, the main feature of the distance education systems is the ability to establish necessary knowledge sources and gain knowledge individually. The possibility of studying process individualization is one of the main advantages of the application of information technologies.

Everything mentioned above contributes to solving the issue of studying individualization based on methods, technologies and software development for distance education. During the studying process within one subject, adaptive E-learning management model based on Moore's finite-state machine has been implemented. In this case educational process is considered as discrete one which is characterized by certain stable states of q_i system. Formalized model of programmed studying management is depicted on figure 1a as Moore's machine; its representations as a flowchart algorithm is depicted on figure 1b [8], [13], [14].

On the every single step of cooperation with the system objects students gain certain educational
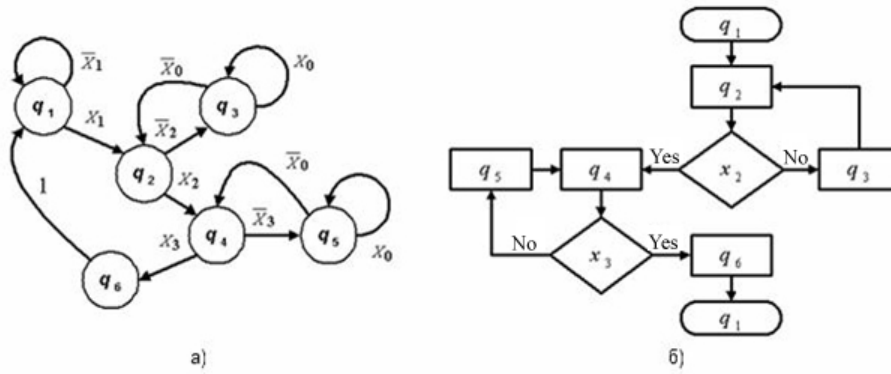
Fig. 1 – Educational model based on Moore's machine

influence x_i - some amount of the educational material Ry_i, represented by the set of text (hypertext) ay, static graphic py_i, animated graphic and video information vy_i, as well as audio data ay_i. However, if the material is learned by the student, he transfers from the state q_m to the new stable state q_k. If the result of studying is negative ($\overline{i_x}$), then the additional material R_{add} should be learned or one should return to the educational material represented by other objects Qy_{i-1}. Thus, the transition from the state q_4 to q_6 is performed if influence x_3 was successful otherwise transfer to the state q_5 is occurred. Conceptual thesis model is used for text analysis [8], [13], [14]. Through analytical review of text and special visual interface, semantic entities are highlighted and included into the database by the operator. The main semantic entities of the model are concepts and theses. The concept expresses the object of knowledge which is discussed in the given fragment of the studying material. A thesis is a statement or assertion of the concept. Each concept corresponds to a set of theses extracted from the text describing this concept. The set of concepts is $C=\{c_1,...,c_{n2}\}$. The set of theses is $T=\{t_1,..., t_{n1}\}$. The set of content elements is $V=\{v_1,...,v_{n3}\}$. The information stored in the database as a pair "concept - the thesis" allows to draw conclusions about the discussion objet in a given text.
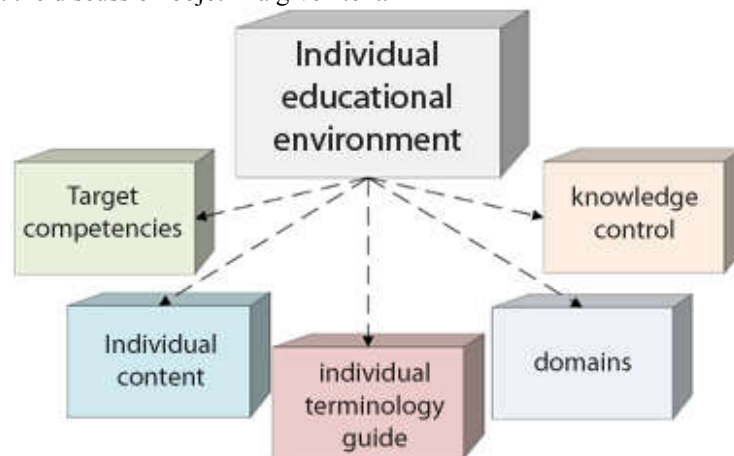

Fig. 2 – Set of components for personalized educational environment

Each element of the content v_i may have any number of the theses t_j: TV: $V \rightarrow 2^T$.
Each theses t_j is related to one element of the content v_i. VT: $T \rightarrow V$.
Each concept c_k may have any number of theses t_i. Theses affiliation to concepts can be reflected as CT: $T \rightarrow C$.
Each concept has a certain set of theses which can be reflected as TC: $C \rightarrow 2^T$.

One more essential task is to prepare personalized educational environment which would be able to organize personalized access to resources and meets all other needs of the user. The basic set of components of the educational environment which is generated on the basis of Tree-Net[8], [13] models complex contains a set of individual competencies $iS \subseteq S$, individual content area $iV \subseteq V$, individual set of domains $iG \subseteq G$ and

individual terminology guide which is represented by the set of concepts $iC \subseteq C$

where $iE = < iS, iV, iG, iC >$.

Summary and conclusions. Hence, the article deals with the intellectual educational system model. It is aimed at solving scientific and technical issues in informatics and system engineering domains. The educational process is based Moore's machine model, conceptual thesis model which is used to develop 'concept-theses' pairs and tests on these pairs. Usage of the Tree-Net model components allows personalization of the educational environment which helps to understand the place of the information in the educational plan. It also helps to extend opportunities for individual acquaintance with the subject field of the study.

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