APPLICATION OF BIG DATA TECHNOLOGIES IN THE DEVELOPMENT OF EDUCATIONAL SYSTEMS

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Abstract. Big Data can become an indispensable tool for transforming the education system, modernizing approaches, narrowing existing gaps and introducing expertise to improve the efficiency of the educational system. Today, the task of presenting technologies for working with big data is considered relevant, which is aimed at the development of educational systems through the identification of formed patterns in the education system. The author of the article defines the methodological aspects of the implementation of big data technology in education, as well as methods of working with them. The main approach in this case is modeling the development of the educational system with the inclusion of regulation measures based on the results of the analysis of the identified formed patterns.

Keywords: educational systems, big data, teaching technologies, Big Data technology.

Аннотация. Большие данные могут стать незаменимым инструментом для преобразования системы образования, модернизации подходов, сокращения существующих пробелов и внедрения экспертных знаний для повышения эффективности системы образования. Сегодня актуальной считается задача презентации технологий работы с большими данными,
которая направлена на развитие образовательных систем через выявление сформированных закономерностей в системе образования. Автор статьи определяет методологические аспекты внедрения технологий больших данных в образовании, а также методы работы с ними. Основным подходом в данном случае является моделирование развития образовательной системы с включением мер регулирования по результатам анализа выявленных сформированных закономерностей.

**Ключевые слова:** образовательные системы, большие данные, технологии обучения, технологии больших данных.

The education system in Uzbekistan has been completely changed in the shortest possible time. Changes began with scientific and teaching staff. They were asked to take training and retraining courses. And also the entire educational process was completely revised, from preschool to the curriculum in universities. Now he focuses on an individual approach to each student or pupil, capable of revealing a person's capabilities, stimulating his self-realization, becoming, self-affirmation. Manipulating big data in teaching is a technology for analyzing the educational system, including the definition, collection, research and presentation of highly structured and unstructured data of large volumes about students and the educational environment in order to identify the features of the functioning and development of the educational system. To date, the education system has accumulated a significant amount of data. The question of how to start efficiently processing large amounts of data will be removed with the advent and expanded use of information and communication technologies in education.

There are five main types of data in education [1]:
- personal data about students;
- data on the interaction of students with electronic learning systems, for example, electronic courses, as well as electronic materials;
- information and statistics on the effectiveness of training materials;
- system-wide data;
- forecast data.

Based on the analysis of many approaches and models in their speeches I. D. Frumin identifies three major areas of Big Data [3]:

1) associated with thinking (primarily critical and creative thinking);
2) related to interaction with others (communication and collaboration);
3) associated with interaction with oneself (self-regulation, reflexivity and self-organization).

The methodological basis of the research in the context of this thesis is the formalization of the technology of using Big Data, aimed at the development of educational systems through the definition of formed patterns in the education system. Here are the distinguishing features of Big data in education from other data samples. Big Data characteristics can be described according to the “7V” rule:

- 1V (volume): the volume of physical data is significant;
- 2V (variety): the variability of algorithms for processing different types of collected results; for example, the results of tests or other tasks for students can be presented in terms of parallels, gender, age, health group, family size, etc;
- 3V (velocity): the speed of data collection and processing speed is relatively high; for example, data on grades for the performance of work are entered no later than the end of the day they are received; the teacher, after entering the data, can almost immediately get acquainted with the performance analytics;
- 4V (veracity): high reliability of the collected data, allowing the formulation of representative results;
- 5V (value): the value of the accumulated data should be contained in the ability, on their basis, to formulate useful multi-aspect dependencies of the education system;
- 6V (visualization): using charts and graphs to visualize large amounts of complex data is much more effective in conveying meaning than spreadsheets and reports chock-full of numbers and formulas.
-7V (variability): furthermore, the intrinsic meanings and interpretations of these conglomerations of raw data depends on its context. This is especially true with natural language processing. A single word may have multiple meanings. The boundless variability of Big Data therefore presents a unique decoding challenge if one is to take advantage of its full value [2].

For structuring Big Data management processes in education, it can be five interrelated groups of processes have been identified (Table 1).

Table 1.

<table>
<thead>
<tr>
<th>Analysis of indicators</th>
<th>Planning</th>
<th>Adjustment</th>
<th>Data collection</th>
<th>Completion</th>
<th>Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>analysis of the data obtained, determination of methods presentation of results;</td>
<td>selection of sources of information, procedures for obtaining data, information processing algorithms;</td>
<td>development of practical regulatory measures;</td>
<td>organization of data collection in a single database;</td>
<td>fixing a pattern;</td>
<td>defining the goal and objectives of the research.</td>
</tr>
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</table>

Big data, like any technology in education, does not save the teacher from empathy and interaction with the learner, the person's ability to empathize and motivating is always important, and this function is not available to computers. Their advantage in what they help to make of a teacher a super teacher. For example, the system can analyze hundreds of thousands of texts on the Internet and select the one that contains the required number of new words. This is what a person is not capable of, but a machine can do it. With the help of big data, we can do, relatively speaking,
three important things: to create methodologies adapted to a large number of students; personalize content; select a training mode. Note that Big Data will soon change higher education technologies, allowing to make the teaching of students more individual: not only to choose their own course curriculum, but also to give separate homework, as well as provide verification assimilation of the content.

Students will receive more detailed recommendations on various topics and have an expanded information space. They know how to predict how successfully the course is completed even before the start of training now. Students will have the opportunity to choose their course program, complete a separate homework assignment, get more detailed recommendations. With big data, there will be fewer laggards in university groups as technologies will allow early identification of students who may be at risk, and teachers will be able to better help lagging students, as the program will indicate in which areas of knowledge there are problems. The system will also help teenagers in choosing a university: it is assumed that robots will select the best places to study for prospective students, they don't even have to apply. The system will choose the best places for future students, and by the end of the university, each student will have digital portfolio to help young professionals navigate the market labor, it is easier to navigate when choosing a career, and employers in the selection of specialists [3].

In conclusion, it should be noted that the possibilities to generalize and use the Big data in the electronic environment is great. The reasons for this are a number of factors:

First of all, data analysis allows to work with individual programs. Learners, personalize learning. The data shows which type of student with what part of the content interacts, how does this interaction take place, where it manifested interest, and where he was bored, with whom and how he interacted in the learning process, how the passage of a course influenced educational results, at what stage learning he needs help.
Secondly, educational analytics powered by big data is changing understanding of the format of educational programs. Texts used in educational process, can be not only digitized, but also converted into numerical data. Users move through the content with more freedom, then analysis of how users interacted with the material is carried out: what turned out effective, which is ineffective. Therefore, the educational program is being transformed from an approved format text into the format of some collection of online content that changes dynamically through the analysis of data resulting from interactions with online content students. The so-called "smart program" and "smart curriculum" appear. It can be assumed that the curricula of training courses will also undergo changes: they can become meta-subject.

Big data opens up new horizons in modern education, with the development of these technology education reaches a higher level when the use of Big data allows to identify students who find themselves in a situation of expulsion or deserve special merit. This allows us to track such situations and help them. Both in successful advancement along an individual educational trajectory, and for excluding the situation of losing a place at the university. Analysis of data on the quality of training can guide the participants to choose the education and career most corresponding to personal qualities and their interest in the long term.

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