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Issue Article

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DIGITAL OIL AND GAS UNIVERSITY - OPPORTUNITIES AND PERSPECTIVES

Abstract: *Today in Uzbekistan, the development of the oil and gas industry is inseparably linked with the introduction of digital technologies and innovations at all its stages. In the long term, the fuel industry will focus on the creation of high-tech petrochemical clusters, which will allow mastering the production of processing products of traditional and alternative hydrocarbons with high quality characteristics. To implement these large-scale tasks, first of all, two important conditions are necessary: the availability of appropriate infrastructure and qualified personnel. In this regard, the article proposes the creation of a digital oil and gas university, which will be aimed at meeting the requirements of companies for the quality of education and ensuring the full life cycle of training new personnel for the oil and gas sector.*

Key words: *Digital oil and gas university; qualified personnel; fuel and energy industry; international educational space; digital technologies; digital resources; digital platform; individual educational trajectories; process simulators.*

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Introduction

Due to the changing nature of the energy industry and the challenges it faces, one of which is the complication of the current industry complexes for hydrocarbon production, there is a need for equipment modernization and technical re-equipment, as well as the inevitable transition of production to digital technologies and automatic control methods. According to the results of research conducted by IHS Markit, 86% of company leaders say that the introduction of such digital innovations as smart fields, digital twins of oil refineries is transforming their business to a greater extent than any other trends (Figure 1) [7, 13]. That is why digitalization, being a priority for the development of the oil and gas industry, is a key element in increasing the competitiveness of enterprises.

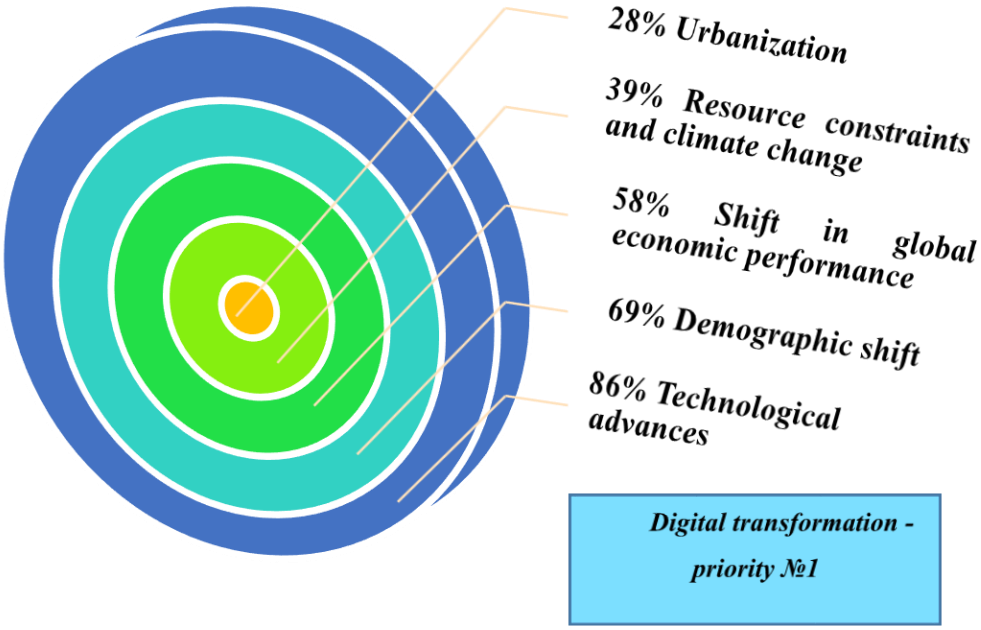

Figure 1. Trends that transform business in the next 5 years [7, 14]

On January 25, 2020, the President of the Republic of Uzbekistan Shavkat Mirziyoyev spoke about the most important priorities for the development of digital technologies in the country in his address to the Oliy Majlis: "For the further development of science in our country, teaching our young people deep knowledge, high spirituality and culture, accelerating our work on formation of a competitive economy, we will continue to raise the level of science, education and the digital economy in 2020" [10].

However, the introduction of digital technologies contributes to the displacement of traditional approaches in all spheres of human life. Under the influence of external unforeseen factors, such as the outbreak of the COVID-19 pandemic, these processes are significantly accelerated, and have already pushed the public consciousness to global changes in the formation of new principles for the functioning of production, construction, transport, and financial relations. But first of all, the cardinal restructuring affected the sphere of education.

Consequently, the oil and gas industry is already facing the problem of retraining workers who are losing their jobs due to automatization, the emergence of new digital specialties and the required competencies. In order to be able to provide advanced training of new personnel by the oil and gas educational services market, it is proposed to create an educational platform where flexible continuous digital training in oil and gas competencies and specialties will be introduced.

Literature review

In an article entitled «Digital Modernization of Education: Pros and Cons», the author talks about the need for modernization of the country, taking into account the technological revolution taking place in the world, "the speed of technological change is accelerating rapidly, going up sharply. Whoever uses this technology wave will go far ahead. Those who cannot do this, this wave will simply overwhelm, drown" (Antonova, Khorina, Gavryushina, 2022) [2, 32]

To solve the problem of a shortage of qualified specialists in the field of the digital economy, it is necessary to increase the number of graduates of educational institutions of higher and secondary vocational education in areas of training related to information and telecommunication technologies, to increase the proportion of the population with digital skills and information technologies. All this requires the modernization, digitalization of the educational system, the transition to an electronic form of education. The role of the teacher is changing in the era of the digital economy, new forms of interaction between the teacher and the student, the so-called network interaction, are emerging. Recently, in the conditions of the digital economy, the leading role in the pedagogical process belongs to electronic educational technologies. One of the most demanded pedagogical trends is the formation of massive open online courses for systems of level and additional education (massive open online courses-MOOC) (Ramazanova, 2020) [12, 108]

The widespread introduction of modern digital means of communication into the educational environment raises many questions and causes a large number of problems that cannot be solved within the framework of the traditional educational paradigm. Among these problems are the obvious mental changes of the new, so-called digital-born generation, which is capable of consuming huge amounts of information and finding ready-made solutions in it, skipping the traditional stages of logical conclusions based on fundamental analysis (Anakhov, 2020). [9, 82]

Research Methodology

The proposed project of the digital oil and gas University is a self–customizable service aimed at building options for individual educational trajectories in accordance with the requests from the oil and gas company. Since the necessary condition for the functioning of this platform will be the provision of accessible education to every oilman anywhere and at any time, the operator of the digital oil and gas university will become one of the most popular new specialties.

It is obvious that a digital university should not be considered exclusively as a double of a "physical" university, since digital technologies make it possible to create new conditions, change the order of organization of processes, both training and management.

A digital oil and gas university will be a combination of four interdependent elements: the format of training; digital resources; digital platform; digital environment (Figure 2) [1, 23].

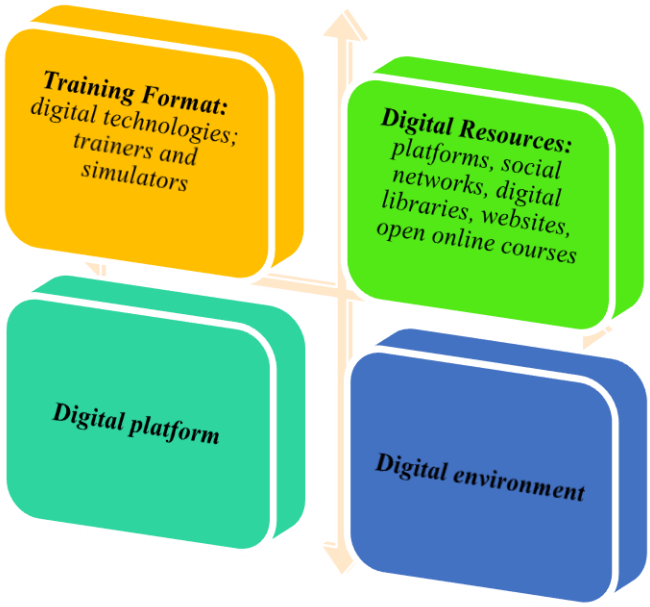

Figure 2. Elements of a digital oil and gas University [1, 23]

The *digital format* of training implies not only the use of digital technologies for remote learning, but also the use of various digital training simulators and simulators of technological processes for employees of the enterprise in the learning process.

Digital technologies are a variety of tools for mastering educational material, for self-study and study with the help of a mentor, for feedback, for monitoring progress. For example, using an online test constructor will allow you to remotely check the knowledge of students. An interactive worksheet is a convenient digital tool that is most often used when a student works independently or when doing practical work. Multimedia presentation is also a popular and actively developing technology in the practice of distance learning, which combines many tools for working with information. Undoubtedly, the use of this technology in the educational process increases motivation to learn, because a new form of information presentation is used, thereby it contributes to better assimilation and better memorization of educational material. [2, 20]

The development of oil fields requires constant monitoring and analysis of a variety of production conditions. The software complexes or training simulators contained in this digital educational resource make it possible to evaluate the efficiency of deep-pumping equipment, take into account the influence of factors complicating production, analyze the state of the reservoir and work out possible emergency situations at the production facilities of oil-producing enterprises. In this regard, they can be used both for training and advanced training of specialists of oil and gas companies, and for the preparation of expert opinions on various production issues [6, 8].

The simulator, in turn, simulates the technological process and provides information about its condition, so that the specialist will be able to gain practical skills in managing the technological installation: when starting; when stopping; when working in normal mode; when working in emergency and emergency situations. Thus, the simulator will allow you to test the knowledge and conduct the certification of technological personnel.

The second element of a digital university is *digital resources*. They embody the tools through which the idea of digital transition is realized. For example, these include digital platforms, social networks, electronic libraries, websites, mass open online courses, various interactive simulators, virtual exhibition stands, databases.

The third element is a *digital platform*, which simultaneously acts as an algorithm for the relationship of participants, and a platform for content placement, and a combination of digital tools, such as an integrated information and analytical system, and an environment with software. Digital Oil and Gas University is a platform that operates on the principle of "one window", that is, the student has access to all the information of interest on his profile, which allows reducing the irrational use of his personal time by a person.

The fourth element is the *digital environment* — a space, a place where interaction takes place.

Analysis and Results

The mechanism of operation of the proposed digital oil and gas university is shown in Figure 3.

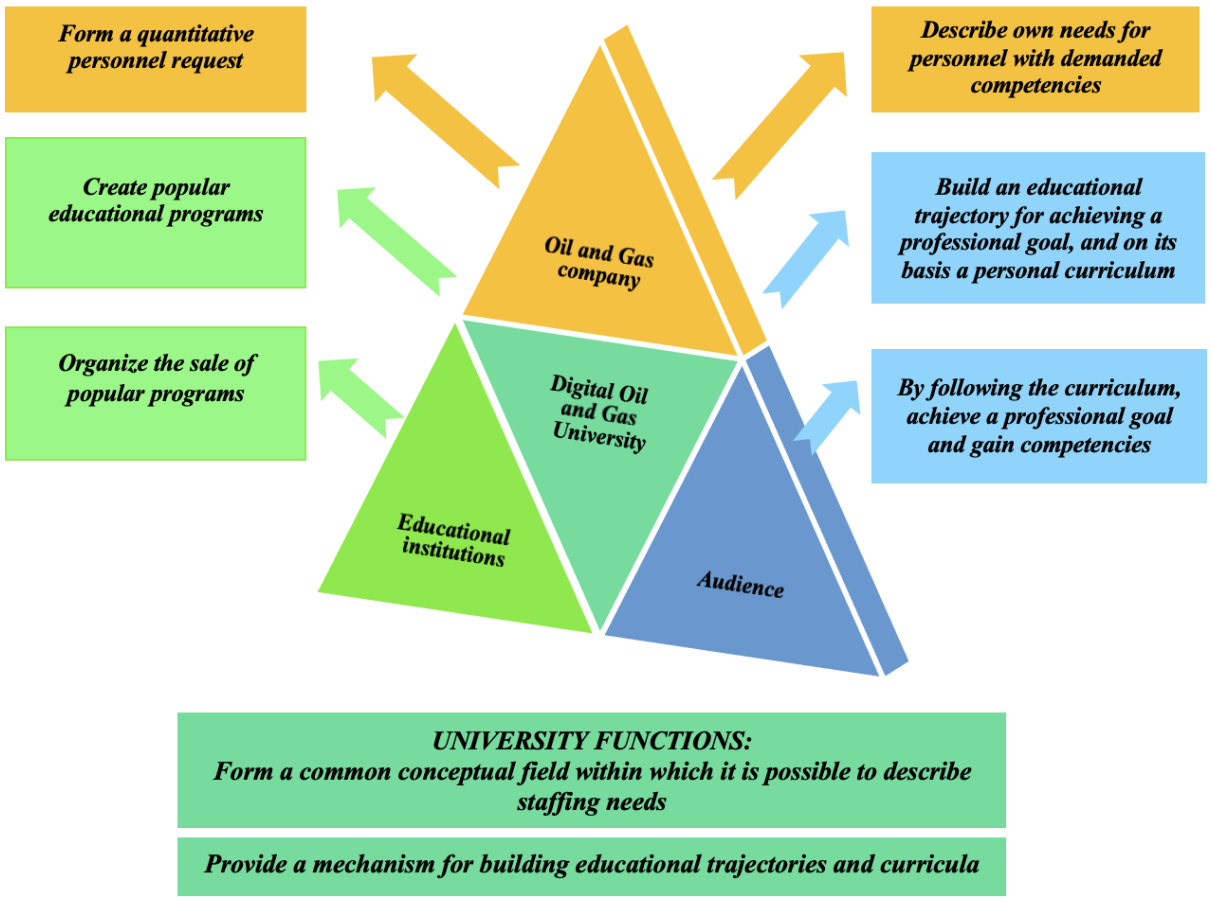

Figure 3. The mechanism of operation of the digital Oil and gas University [9, 81]

First of all, oil and gas companies should formulate requirements for new specialists with digital oil and gas knowledge, and online training, in turn, will allow you to study at any time, easily embedding this process into your work/personal life. Thus, with the gradual acquisition of new competencies and skills, with breaks and monitoring between training, the acquired knowledge will be stored in memory for many years.

State funding of the project

Digital technologies will expand opportunities for the export of educational services. Already, information and communication technology platforms provide an opportunity to meet global development trends and integrate into the international educational space.

However, in the process of implementing this project, financing problems may arise in supporting

the infrastructure of a digital university. The issue of financing is a necessary condition for the formation of digital education, which is expensive, carries not only advantages, but also significant risks, for example, dependence on the project goals of external investors who can both directly participate in the university's digital projects and provide grant support.

In accordance with the Decree of the President of the Republic of Uzbekistan dated January 28, 2022 No. PD-60 "On the Development Strategy of New Uzbekistan for 2022 — 2026", as well as in order to implement priority tasks to raise the sphere of information and communication technologies to a new level, it was instructed to introduce, from October 1, 2022, the procedure for allocating grants in order to support startup projects in the field of information and communication technologies aimed at providing educational IT services, developing software products and exporting them to in the amount of up to 1 billion sums through a competition held by the Ministry of Innovative Development at the expense of the Fund for Support of Young Entrepreneurs under the Ministry of Investment and Foreign Trade. Thanks to this Presidential Decree, it will be possible to receive state support for the implementation of the project to create a digital oil and gas university. [3]

Conclusion

Thus, the digital oil and gas University is the very project aimed at changing the traditional teaching methodology, the purpose of which is to help oil and gas companies significantly save time and costs for retraining; educational institutions – to meet the requirements of modern reality, increasing the efficiency of digital oil and gas education, and attracting highly motivated students; and new students coming for retraining - to show how much their acquired skills will be in demand in digital oil and gas production.

Continuous training of employees at the digital oil and gas University has a number of advantages.

Firstly, the digital oil and gas university will "connect" enterprises and universities so that training does not take place exclusively in the theoretical aspect. To date, there is inconsistency in the requests of specialists at enterprises and in the skills and knowledge possessed by graduates who have received a traditional education. In addition, universities have lost communication with real business. According to the authors, the practice focused on the needs of today's realities and business needs is important.

Secondly, this solution will allow students of a digital university to have access to all of the above elements of a digital university, being in real time, without interrupting their main activities.

Thirdly, the creation of a modern university will lead to an increase in its competitiveness, able to demonstrate digital adaptability in the education market, create additional values and attract more students. Undoubtedly, the expected result of the digitalization strategy of the university as a positioner of authoritative ratings is expected to increase the competitiveness and the level of the image of the university, the interest of teachers and students in the field of research competencies.

Thus, the use of digital solutions is extremely important for our country, since the lack of active dissemination of modern digitalization systems greatly reduces the efficiency of enterprises. Investments made in digitalization today are shaping the energy industry of the future. This will provide a unique chance to jump several steps in development at once and install the latest solutions that have just been applied in leading industrial countries.

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