Modern Directions of Economic Development and the Role of Education Based on Information Technologies in it

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Annotation: The relevance of the scientific research work within the article is that the role and importance of education in the application of modern directions of economic development to industries and sectors has been revealed.

Key words: Digitization of the economy; artificial intelligence; innovation; the fourth industrial revolution; software.

In recent years, technological improvement is taking place rapidly in all sectors of the economy, especially in the fields of production, service, trade and logistics. This requires increasing the offer of educational programs in the field of information technology (IT) in the modern world. Because the influence of countries in the international arena, their position in foreign policy largely depends on a competitive economy based on innovative and information technologies.

An important and unique condition for achieving a competitive economy is education based on high intelligence and modern knowledge. In this regard, in the modern world, where the fourth industrial revolution is taking place, the need for education in the field of IT (Information technology) is felt more than ever. Well, when and where was the concept of the fourth industrial revolution first used, and with what changes and updates: included. Klaus Schwab, executive chairman of the World Economic Forum (WEF), introduced this phrase to the general public in a 2015 article titled International Relations.[1] That is, in industry, the global production and supply chain has connected with radical changes in traditional production using modern smart technologies, large-scale machine-to-machine communication and the Internet of Things.

From this point of view, comprehensive measures are being developed in each region of our republic for the further development of digital technologies, the wide introduction of digital technologies in public administration and economic sectors, in particular, the development of smart entrepreneurship and their support.

The priority tasks set in the measures for the development of digital technologies and "digital" startups in the "Digital Uzbekistan - 2030" strategy, approved by the Decree of the President of the Republic of Uzbekistan No. PF-6079 dated October 5, 2020, confirm our opinion once again:

➢ introduction of alternative mechanisms of the system of financing projects of startups and business entities in the field of information technologies;

➢ creation of favorable conditions for the development of a stable chain of financing system of innovative ideas, start-ups and venture projects;

➢ to assist newly started and small enterprises in the field of information technologies in the implementation of start-up projects, attracting investments from the results of innovation activities;

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[1] https://uz.wikipedia.org/wiki/To%CA%BBrtinchi_sanoat_inqilobi

- ➢ development of the development of scientific and research developments aimed at the creation of high-tech products with high commercialization potential in the field of information technologies;

- ➢ to support the creation of high-tech entrepreneurship centers and clusters based on cooperation between business enterprises, universities, research institutes and scientific centers;

- ➢ Systematic state support and grant subsidies to technology parks, accelerators and incubators through hackathons, contests and conferences.

First of all, let's clarify the concept of digital entrepreneurship. Digital entrepreneurship is a modern form of business activity, which is distinguished by the effective use of digital technologies, such as the Internet, mobile technologies, and digital platforms [5]. In other words, digital entrepreneurship is an online business created and managed by individuals or legal entities. From this point of view, the digital competence of entrepreneurs can include such skills as website development, business automation, and Internet advertising.

The lack of digital competence of business entities can be identified as the main problem in the development of digital entrepreneurship in our country.

In fact, today, the modern direction of the development of the world is based on the information technology of the economic network, industry and social life. If we give a brief explanation of IT (Information technology) here, IT is an acronym taken from the English language and means "Information technologies" in Uzbek. Electronic computing techniques, and later the invention of new generation computers, were the first steps to enter this field. Later, we can see the development of information technology in the examples of companies such as Microsoft, Dell, IBM, Apple, Google, CISCO Systems, Fujistu, Tech Data, SAP, HP Enterprise, Synnex, and such rapid development has sharply increased the demand for specialists in the field.

The CEO of IT Park University, Bahadir Ayupov, in his scientific article entitled "Future Education IT Education" linked the importance of information technology education with the following reasons:[2] "High demand for IT professionals; increasing demand for training programs for information technology specialists; the existence of many vacancies related to software development, data analysis, cyber security, artificial intelligence and other areas of IT, not only in Uzbekistan, but also internationally; The IT industry is in constant motion, new and innovative technologies are introduced every day.

This means that education in the field of IT helps us to be aware of the latest trends, to quickly adapt to the changing environment; commerce based on information technologies covers all sectors and consumer segments of society, which helps to automate activities, increase work efficiency, improve communication and create new business opportunities; education in the field of information technologies creates conditions for understanding these technologies and using them for innovation and transformation in various fields; IT-based education develops the ability to think critically and find technical solutions to various problems; education in the field of information technologies allows the future staff to get a well-paid job, participate in innovative projects, contribute to the development of modern society and is important for creating a sustainable future.

The relevance of the research in this article is related to the global IT workforce shortage and its solution. The reason is that at the end of the first quarter of the 21st century, IT (Information technology) rapidly entered almost all fields at the international level and became an important factor of development.

According to the statistics of the World Trade Organization, today at the international level, the IT (Information technology) sector surpasses even the automobile, oil and gas industry in terms of its total market value. As a result, as of January 1, 2023, there is a shortage of personnel in the IT

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[2] Bahadir Ayupov scientific article "Future education IT education", "Higher education in Uzbekistan" scientific, educational, methodological, analytical magazine, issue 3, 2023.

field in the international sphere in 3 out of 4 enterprises. We can include the following types of professions:

Web developer - creates web pages and ensures their stable operation. This profession includes 2 separate areas: Front-end programmer - a person who is engaged in programming the visible part of websites. Back end programmer - serves the functionality of the website or web application, data processing. That's why backend developers need to know how to work with a database. Mobile Developer – Creates mobile applications. This field is also mainly divided into IOS programmer working with Apple products and Android programmer working with Android system.

A software engineer creates computer systems and programs to solve life problems. It is necessary to choose one of several programming languages. Popular programming languages: UX/UI designer – Creates designs for web pages, mobile applications. It mainly uses programs like Figma, Adobe XD: Game developer - Creates computer games: Data engineer - Analyzes a lot of data and makes sense out of it. For example, predicting how much sales will be next month. Information security personnel - Responsible for data and information security for the company: Computer systems architect: System and network administrator: IT manager - who fulfills the company's information technology requirements. Project manager - responsible for IT project development: QA engineer - checks applications and sites before they reach the user and prevents problems.

According to the statistics agency under the President of the Republic of Uzbekistan, as of January 2023, the share of information and communication technologies (ICT) services in the country's economy was 1.7%.[3]

66.5% of the gross added value created in the network are communication services, 19.4% are computer programming, consulting and other auxiliary services, 7.0% are data storage and processing services, Web-portals, Computer and communication equipment repair services accounted for 4.7 percent, and the remaining 2.4 percent for software development.

A look at the world experience in the development of information technology education. Countries such as the USA, Japan, Germany, South Korea, Singapore, India, Great Britain, and China have achieved great results in terms of the development of information technologies and digitization of economic sectors at the world level. For example, IT (Information technology) accounts for more than 12 percent of the annual gross domestic product in South Korea.

"Many of the most prestigious universities in the United States, such as the Massachusetts Institute of Technology, Stanford University, and Berkeley in California, have modern IT programs. These universities allow students to conduct real-world research in state-of-the-art laboratories and access a rich IT learning environment. In recent years, Singapore has been striving to become the technological center of Asia. That is why its higher education system is actively developing in the field of information technologies. Higher education institutions such as the National University of Singapore and Nanyang Technological University offer quality programs in IT and related fields. "Students in Singapore have the opportunity to learn from renowned professors and participate in international research projects"[4].

In order to take a strong position in the IT (Information technology) market, systematic measures are being implemented in Uzbekistan, including; 1 billion IT exports in the next 5 years. It is planned to deliver to US dollars.

In order to widely promote knowledge based on information technologies among the population, to encourage the improvement of knowledge and skills of IT specialists, a presidential competition

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[3] The official website of the Statistical Agency under the President of the Republic of Uzbekistan. https://stat.uz/uz/
[4] Bahadir Ayupov "Future education IT education" scientific article, "Higher education in Uzbekistan" scientific, educational-methodical, analytical magazine, issue 3, 2023.

will be held among IT specialists with a prize worth 1 million US dollars for the winners; We can give examples of IT-Park, 1 million Uzbek programmers, mGovAward and other projects.

In addition, in order to develop information technologies in all branches and sectors of Uzbekistan, on October 5, 2020, the President of our country approved the "Digital Uzbekistan - 2030" strategy and measures for its effective implementation" No. PF-6079 The decree was accepted. According to this decree, "the development of digital education in the formation of an economy based on high intelligence and information technologies is defined as a priority task.

Starting from January 1, 2021, up to 50 percent of the costs of obtaining international IT certificates by citizens in system management, database and "cloud" platform management, ensuring information security and other areas of high demand it is decided to introduce a partial compensation system; We can cite a number of examples such as the opening of educational centers for digital technologies for a wide population, especially young people and women, based on existing infrastructure facilities in each district and city[5].

In conclusion, it can be said that educational institutions providing the labor market with personnel (professional educational institutions, higher educational institutions) should pay attention to the following aspects when organizing the educational process:

➢ application of educational courses (science) related to IT (Information technology) based on the characteristics of the educational direction in the formation of educational plans for various specialties;

➢ formation of admission quotas for professions in high demand by analyzing the situation in the national and local labor market;

➢ organization of intensive educational courses in information technology and programming areas for applicants based on an additional program;

➢ organizing competitions among students and teachers in educational institutions every year in nominations such as the most active "Computer programmer", "IT (Information technology) employee", "Web developer" and encouraging the winners;

➢ Development and implementation of mechanisms for activating the activities of information technologies and young programmer circles.

List of used literature

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3. Official website of the Statistical Agency under the President of the Republic of Uzbekistan. https://stat.uz/uz/

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[5] Decree of the President of the Republic of Uzbekistan No. PF-6079 on the approval of the "Digital Uzbekistan - 2030" strategy and measures for its effective implementation. 05.10.2020. https://lex.uz/ru/docs/-5030957