Большие данные (Big data) как новая валюта цифровой экономики.

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Annotatsiya	В данной статье мы рассматриваем стремительно развивающуюся отрасль цифровой экономики – большие данные, которые в современном мире позволяют правительствам, бизнесу и социальным структурам превращать тонны гетерогенной информации в структурированное знание. Обсуждается опыт развития науки о больших данных в лидирующих странах мира и на их примере рассматривается возможность применения больших данных в Узбекистане.
Kalit so'zlar:	цифровая экономика, цифровизация, Big Data, полу структурированные и неструктурированные данные, блокчейн, поставщик инфраструктуры, датамайнер, системный интегратор, разработчик готовых сервисов, облака.

Introduction.

The era of the information revolution has touched all spheres of business and every person on earth. Huge flows of data and information create more economic value than global merchandise trade. Data-based business ideas create new opportunities for economic growth and societal solutions.

Each stage of development was characterized by a certain resource, so the main resource in the era of agricultural civilization was the land, and in the era of industrial civilization - raw materials, fuel.

In the era of the digital economy, data and professional competence became the main resource. Clive Hamby, the British mathematician and architect of Tesco's Clubcard card, was one of the first to compare the data to new oil. Oil is valuable, but you can't use it in the raw state. As oil needs to be turned into gas, plastic, chemicals, etc., to create a valuable substance that promotes profitable activities; so data need to be broken down, analyzed to make them valuable". [3]

Wired also compared information and analysis with oil. In the 18th century not everyone understood the potential profitability of oil production, but those who understood, managed to make on this condition. The same thing awaits us with the information. [4]

During his visit to the Chinese Academy of Sciences in 2013, Chinese Secretary General Xi Jinping noted: «Big data is a «free» resource in industrial society. Those who control the data will get an advantage».

Big Data Essence

To remain competitive, companies need to extract information from vast and diverse data sets. Those companies that have learned to analyze and use big data have a bright future.

Research on the digital economy begins with big data (Big data). Clifford Lynch in his article «How is your data growing?» [5] noted that there is an explosive growth in the global amount of information and business needs to take advantage of the opportunities that large amounts of data provide. This means that it is necessary to constantly collect, study, organize, transform, store data in order to identify useful information, conclusions, new ideas, justification of new decisions.

Big data is a combination of proven and newly introduced technologies that enable companies to extract information from existing data for use in their activities. Big data can be defined as the ability to manage large volumes of heterogeneous data at a rate sufficient to analyse such data in real time and to respond in a timely manner. [6][7]

Big data sources are social networks, events related to the actions of users in various applications, bank payment transaction flows, data from the world «Internet of things». All this data variety can be divided into structured, semi-structured, and unstructured data. 20% of the total data are structured data, which have a certain length and format. These are numbers, dates, or combinations of words and numbers, such as client name and address. Unstructured data represent 80% of the total data and do not have a certain format. These include social media recordings, photos, website content, satellite imagery, surveillance and video recorders.

The need to store and process ever-increasing volumes of big data in order to extract useful information from them has led to the emergence of new storage technologies and big data analytics techniques. Innovative technologies such as Map Reduce, Hadoop, and BigTable have triggered a new generation of data management systems and are aimed at quickly detecting new knowledge in data and identifying actions, products and services that can be derived from knowledge.

A set of methods of detection in the data of unobvious, objective, practically useful and accessible for understanding by the person, for decision making - is a deep analysis (Data Mining).

Text Mining technology covers new methods for performing semantic text analysis, information retrieval and management, including tonality research. It can be used to analyze large and very large arrays of unstructured information.

Call Mining technology combines speech recognition, analysis and Data Mining. Its purpose is to simplify the search in audio archives containing recordings of conversations between operators and customers.

Web Mining technology covers methods that are able to discover new, previously unknown knowledge based on site data and that can be used in the future. Web Mining technology uses Data Mining technology to analyze unstructured, heterogeneous, distributed and significant information contained in Web-sites. According to the characteristics that Meta Group has defined for big data, they have the following features:

- volume - from 150 GB per day;
- velocity- continuous creation of large amounts of data sets high processing speed requirements;
- variety - modern technical tools allow to analyze any structured and unstructured information;
- Reliability (veracity) - Reliability of data and its analysis;
- variability - not always data flows are stable, variable data flow is more difficult to analyze;
- value - the value and significance of information. Big data can be simple (posts in social networks) or difficult to perceive and analyze (bank transactions).

Market research reports have shown that data is growing at an incredible rate. According to IBM, by 2003 the world had accumulated 5 exabytes of data, by 2008 this amount had increased to 0.18 zettabytes, in 2013 the figure was 4.4 zettabytes. According to Statista, the volume increased to 64.2 zettabytes in 2020 and 79 zettabytes in 2021, and is projected to grow to more than 180 zettabytes by 2025. In 2035, it will grow exponentially to over 2,100 zettabytes.

DATA ACCUMULATION (ZETTABYTE)

Unit of information
1 3B (zettabyte) = 1024 EB
1 EB (exabyte) = 1 billion GB
1 PB (petabyte) = 1024 TB
1 TB (terabyte) = 1024 GB
1 GB (gigabyte) = 1024 MB
1 MB (megabyte) = 1024 KB

180
64,2
33
0,0048   0,18   4,4   6,5
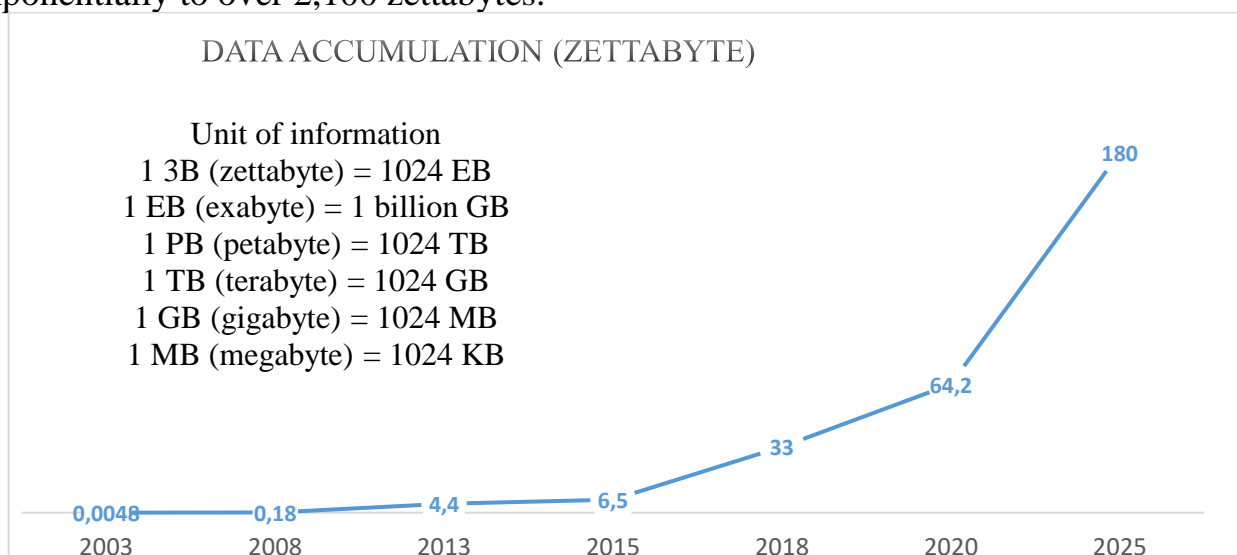2003   2008   2013   2015   2018   2020   2025

Fig1. Dynamics of data growth.

The increase in demand due to the COVID-19 pandemic was responsible for the creation and synthesis of new data in 2020. The crisis caused by the spread of the new coronavirus has intensified the shift from offline to permanent online work, i.e. more people have worked and studied from home and have used home entertainment more often.

Efficient and competent use of Big Data gives great advantages. Big data processing makes analysis predictive and gives business recommendations for the future. Today, Big Data is used in government, industry, medicine, commerce, agriculture, real estate, sports, tourism, transport, construction. Big data analysis in public administration helps to make decisions regarding employment, economic regulation, security. In medicine, the processing of collected data sets allows us to identify epidemics, make quick decisions in emergency cases, make accurate diagnoses, find new drugs. In industry, introduce a predictive production system to forecast more accurate demand for products. In agriculture, for example, using precision farming to process information collected from sensors of special weather stations that stand in the fields, build high-

precision hourly weather forecasts. Real estate developers using Big Data technology analyze information flows and provide customers with the most interesting options. Thus, the buyer can get acquainted with the house he liked without the seller. In sports, big data processing allows you to select the most promising athletes and develop effective strategies for both athletes and opponents. In business Big Data provides such advantages as simplifying the planning process, increasing the start-up speed and demand for new projects, optimizing integration into the supply chain, increasing the target audience, improving the quality of customer service, which in turn leads to loyalty of current clients.

BARC reports that organizations are reaping the benefits of using Big Data - 69% chance of making better strategic decisions, 54% chance of improving the control of operational processes, 52% for better understanding of consumers, and 47% for effective cost savings. Organizations that benefit from Big Data report an average income increase of 8% with a 10% cost reduction.

Big data structure.

The Big Data system includes infrastructure providers, datamaners, system integrators, consumers and turnkey service developers. Consider each element of the system.

Infrastructure providers. Storage of Big Data is a problem. Infrastructure providers perform data storage and preservation tasks. There are three main ways to store data: traditional, in public clouds and in private clouds.

In the traditional («keeping one's own») method, information is written to disks, tapes or local storage. With this method, the data is always near, so it is habitual and quieter, you can easily and quickly connect to the local media and at a price it is usually acceptable. But they are unreliable, as disks and servers can fail due to physical wear, they cannot be accessed if you are far away, and the media is limited (you need to buy new media and place them somewhere).
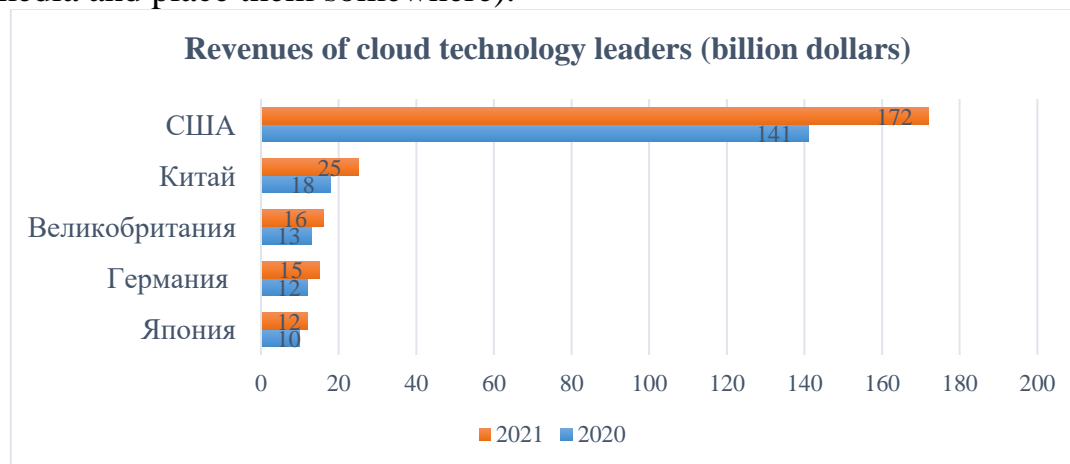

Figure 2 Revenues of cloud technology leaders. [8]

Public clouds provide data storage for a fee based on data volume and related services. The five countries that provide cloud technologies include the USA, China, Great Britain, Germany and Japan (fig.2). One of the first companies to make a completely new profit by providing its unused computing resources was Amazon. Today the largest cloud providers are Amazon Web Services (AWS), Microsoft Azure, Google Cloud, IBM Bluemix, Oracle. Amazon is the world's leading data storage company.

Chinese companies quickly catch up with foreign competitors in the race cloud services. The market leaders in cloud services in China are Alibaba (Alibaba Cloud), Tencent (Tencent Cloud), Huawei (Huawei Cloud) Baidu (Baidu Cloud).

The benefits of public clouds include:

•convenience (companies do not need to buy and maintain physical servers, which simplifies the basic scenarios of work);

•relative security (most providers provide data protection with their own encryption algorithms);

•Acceptable prices (prices fluctuated at 5-10 cents per gigabyte per month, and are now on a downward trend);

•relative reliability (in case of loss there is a possibility of replication of data);

new opportunities in the future.

The drawbacks of public clouds include the psychological factor (the feeling that someone else has access to your data), the speed of access (the speed of access to the Internet is measured by megabytes per second, which is ten times slower access to local repositories), prices (cloud storage more expensive than local).

Private clouds are repositories that are part of companies' infrastructure and are used only by their employees. These repositories are used by the corporate sector.

Scandinavian companies are currently leading the implementation of corporate cloud services in Europe (fig.3)
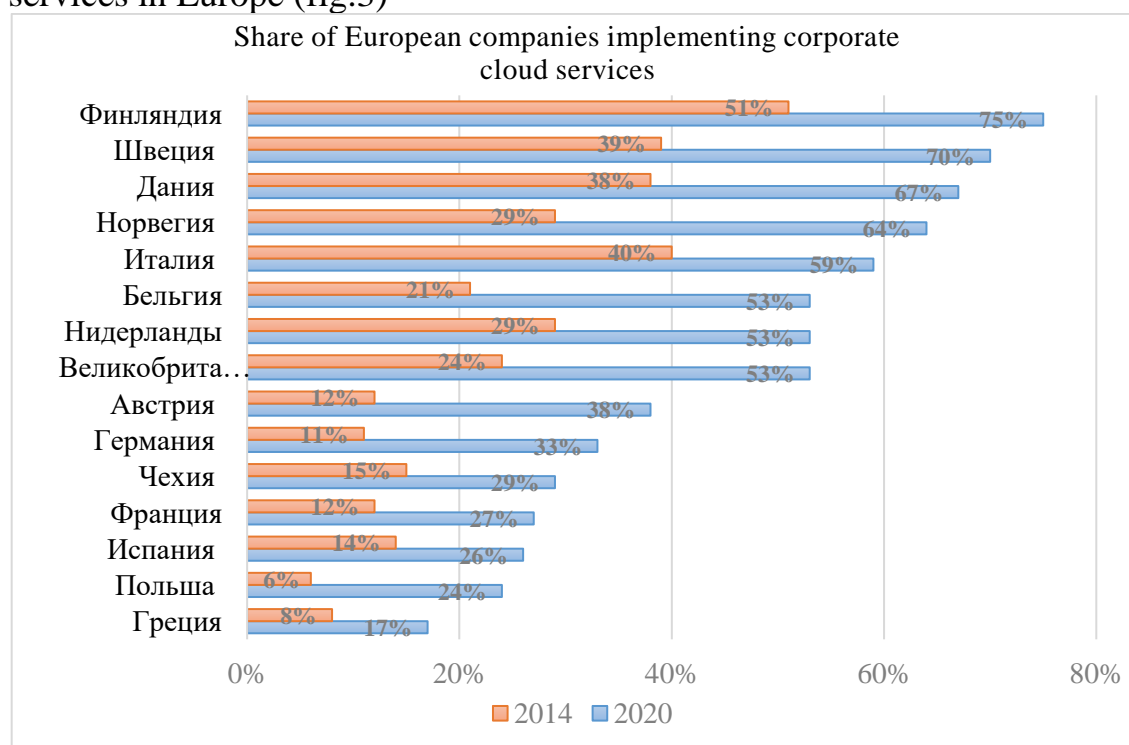

Fig. 3. Share of companies implementing corporate cloud services in selected European countries [8].

System integrators are companies or individuals that offer solutions for automating business processes. On the basis of the developed project, they connect automated systems with each other, which ensures the effective work of the team or the entire organization.

According to the Gartner glossary, the work of the system integrator is to bring order to systems supplied by disparate suppliers. In particular, companies - system integrators are engaged in: implementation, planning, coordination, scheduling, testing, improvement, maintenance of information systems.

Datamaners are specialists in data retrieval, intelligence and depth analysis. From the analysis it is possible to get an idea of the dependence of the data, and on the basis of these connections to make assumptions for the construction of neural network models. For example, an analysis of the behavior of buyers of household appliances stores may show that refrigerators are preferred by people to buy on credit, buying a computer customers buy and printers. Such dependencies help to make better management decisions and increase sales.

Ready-made service developers develop ready-made solutions based on access to big data. For example, Value Appz offers entrepreneurs a ready-to-use, cost-effective platform for creating applications and web solutions that will enable the digital transformation of their business. For example, the platform offers the development of applications for various types of business, such as delivery to order (food, products, drugs), household services (repair work, cosmetic procedures at home, car washing, dog walking), online consultations (doctor, nutritionist, teachers, fitness trainers), online shops (jewelry, clothing, books, gifts), which is designed to meet the requirements of various business verticals. The entrepreneur is provided with a highly reliable solution to attract customers, maximize profits and lead competitors in the selected field.

Big Data development prospects in Uzbekistan

The digital economy contributes 10.9%, China 21%, and India 5.5%. In Uzbekistan, this figure does not exceed 2 per cent.

The year 2020 was declared the Year of Development of Science, Education and Digital Economy in Uzbekistan. The strategy «Digital Uzbekistan - 2030» was approved in 2020 in order to form and develop the digital economy of our state. The strategy envisages breakthrough activities in such priority areas as digital infrastructure, e-government, digital economy, national digital market, training of specialists in the field of information technology. For 2020-2022, activities aimed at increasing the level of connectivity of settlements to the Internet, the laying of 20,000 kilometers of fibre-optic connections, the introduction of more than 400 information systems for the socio-economic development of regions have been planned, implementation of more than 280 information systems for automation of management processes, implementation of the program «One Million Programmers», within the framework of which it is planned to train 500 thousand boys and girls in the basics of computer programming, implementation of the project «Digital Department».

Implementation of the system «E-Government», through which the provision of 178 types of services through a single portal of interactive public services ensures openness, transparency, saves time and reduces costs of the population.

Within the framework of the strategy «Digital Uzbekistan - 2030» 13 model cities and districts were identified, in which work on digital transformation will be carried out within three years on the basis of developed «road maps». During 2020-2021 according to «Road maps» 172 projects on expansion of digital infrastructure, 54 projects on introduction of digital technologies in state administration, 190 projects in the social

sphere, 45 - in housing and communal services will be implemented, 51 in agriculture, 17 in industry, 58 projects aimed at training managers and employees.

The Republic's State Tax Committee was one of the first to launch a major project, provides for the improvement of the current complex of information systems of tax authorities taking into account the re-engineering of business processes of tax administration. The project became the basis for an automated VAT payment control system, which aimed to monitor VAT payment in real time.

In the development strategy of the new Uzbekistan proposed by President Sh.Mirziyoyev, one of the key points in the development of the new Uzbekistan is the development of the digital economy in such areas as communication and telecommunications, information security, education, health care, Financial and banking, construction, agriculture, water, energy, transport, engineering, etc. Uzbekistan already misses 5-7 per cent of the country's GDP annually for financial and economic benefits. The introduction of technologies such as blockchain, bighdat, cloud computing, artificial intelligence will increase GDP by 30% and increase real incomes to 45 million sum per year by 2030, In the long run, these figures could rise to 50% of GDP and 50 million sum per year in 2040-2050.

Conclusion.

Big Data, a rapidly growing digital economy in response to the rapid increase in the volume of heterogeneous information in the world, has become one of the most powerful tools of forecasting, regulation and response on a global scale. Effective management of Big Data becomes extremely valuable for the profit of large information companies and the countries that pay special attention to it. The beginnings for the use of big data in Uzbekistan have already been created, and the improvement of this technology could be the strongest impetus for the development of the digital economy in the country, which in turn has the potential to increase the country's GDP to 10 percentage points.

Использованная литература

1. Ш.Мирзиёёв. Янги Ўзбекистон стратегияси// Т: «Ўқитувчи», - 2021,-657 с.

2. Бутабоев М., Мулайдинов Ф., Захидов Г., Саттарова Х. Рақамли иқтисодиёт// Т: «Инновацион ривожланиш нашриёт матбаа уйи», - 2021, - 598 с.

3. Michael Haupt. "Data is the New Oil" — A Ludicrous Proposition. [электронный ресурс] - https://medium.com/project-2030/data-is-the-new-oil-a-ludicrous-proposition-1d91bba4f294

4. Денис Ламехов. Почему для ритейлеров информация – это новая нефть. - [электронный ресурс] - https://www.be-in.ru/news/35044-data-is-the-new-oil/.

5. Lynch C. How do your data grow? //Nature. – 2008. – Т. 455. – №. 7209. – С. 28-29.

6. Соколова А. Мир bigdata в 8 терминах / (Электронный ресурс) Режим доступа: https:rb.ru/howto/big-data-in-8-terms/;

7. Соколова А. Как устроен рынок bigdata в России/ (Электронный ресурс) Режим доступа: https:rb.ru/howto/big-data-in-russia/

8.Digital economy compass 2021 [Электронный ресурс]. https://www.statista.com/study/105653/digital-economy-compass/

9. Saidturaevich, Y. N. M. (2024). Analysis of Development and Shortcomings in Local Tourism in the Republic of Uzbekistan. *EUROPEAN JOURNAL OF INNOVATION IN NONFORMAL EDUCATION*, *4*(5), 127-129.

10. Yusupov, N. S. (2024). TADBIRKORLIK FAOLIYATIDA LOYIXAVIY BOSHQARUVNI RIVOJLANTIRISH TENDENSIYALARI VA ISTIQBOLLARI. *PEDAGOGS*, *59*(1), 202-207.