BIG DATA MARKET DEVELOPMENT PROSPECTS

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Abstract:

This paper discusses Big Data as a modern technological tool for the processing and storage of large volumes of data, which drives the development and automation of various economic processes. The main approaches and methods for working with Big Data, examples of using Big Data technologies, as well as trends in their development are examined.

Keywords: Big Data, technologies, digital economy, trends in the development of digital economy, data, artificial intelligence.

Introduction

Currently, digital platforms and other systems are collecting vast amounts of various data, with their volume increasing multiple times each year. The spread of mobile gadgets and devices, the development of networks and other digital technologies, including the Internet of Things (IoT), artificial intelligence, and fifth-generation mobile networks, facilitates the global integration of people, cyber-physical systems, and organizations, thereby eliminating the boundaries between traditional sectors of the economy. This leads to the need to analyze Big Data technologies.

Big Data technologies refer to methods, approaches, and tools for processing large volumes of structured or unstructured digital data. In the previous decade, the virtual world was called the "terabyte world," but now digital data are measured in petabytes (1024 terabytes), exabytes (1024 petabytes), zettabytes (1024 exabytes), and even yottabytes (1024 zettabytes).

Analyzing Big Data can help businesses make decisions regarding product development and gain competitive advantages. Big Data also includes innovative methods and tools for data storage and processing, aimed at automating and optimizing business processes, ensuring the most effective decisions based on accumulated data.

Having technologies and tools for processing, analyzing, and extracting valuable relevant data provides entrepreneurs with a unique competitive advantage, significantly improving the efficiency of their activities and the accuracy of forecasting. Currently, less than 1% of accumulated data is analyzed, which highlights the potential for developing the "data economy."

Thus, Big Data has become a tool for making rapid decisions and gaining unique competitive advantages in almost every field of human activity, significantly improving the efficiency of various systems and processes, including managing business operations, reducing various transformation and transactional processes, and shortening the time for product and service development and market entry. At the same time, the increasing volume of created data leads to the problem of "unstructured" information, particularly with the necessary data retrieval costs. The "data economy" is now primarily focused on sectors such as ICT, automated industries, finance and banking, e-commerce, transport, logistics, energy, and other areas that involve and promote the use of digital technologies.

Big data distribution creates the necessary conditions for the dynamic development of the entire spectrum of digital technologies, including cloud technologies, artificial intelligence, quantum technologies, and others.

Digital Transformation: In digital transformation, collecting, processing, and analyzing data—from retrospective stages to real-time and predictive analytics—has great importance. This article discusses these issues.

Literature Review on the Topic:
The concept of Big Data is widely studied by both Uzbek and foreign experts in various fields of knowledge and for improving the management of organizations in different sectors of activity. For example, the prospects for developing the Big Data technology-based service market are analyzed in the works of V.A. Boburin and M.E. Yanenko, scientists from St. Petersburg State University of Economics. They explored the opportunities for utilizing Big Data technologies to enhance the competitiveness of enterprises and provided recommendations on using these technologies in marketing strategies for innovative development of enterprises [1]. Similarly, specialists from Bauman Moscow State Technical University, such as Gurskaya E.D., Dotsenko M.A., and Sokolyansky V.V., also analyzed the prospects for developing the Big Data technology-based service market and

identified the opportunities for using these technologies to increase business competitiveness [2]. Moreover, the possibilities for conducting marketing analysis in the electronic business sector based on Big Data usage were considered by S.V. Maltsev and B.V. Lazarev [3].

In 2016, the Forrester research group successfully identified how Big Data technologies can enhance vendor-customer relationships. By studying customer development trends, experts found that evaluating customer loyalty and extending the lifecycle in the context of a specific company was possible using Big Data technologies.

International researchers, including A. Belle, R. Thiagarajan, S.M. Reza Soroushmehr, F. Navidi, D. Beard, and K. Najarian [4], as well as Professor Tomohiro Sawa from Sapporo University, have conducted research on using Big Data technologies in healthcare [5].

K. Close, C. Meier, and M. Ringel, in 2015, carried out research to optimize trade strategies and market entry stages using geoanalytics. According to the authors, companies in the pharmaceutical industry spend 20 to 30 percent of their average profit on management and sales. If companies start utilizing Big Data more actively to identify the most profitable and fast-growing markets, their costs could decrease immediately.

Researcher S.R. Das emphasized that Big Data technologies will undoubtedly change the economy and politics in the near future [6]. As an example, credit rating agencies use neural networks to create reports, enabling the identification of relationships between economic variables without human intervention through Big Data technologies, rather than relying on standard statistical methods.

At the same time, it is important to note that the use of Big Data technologies to assess the economic activity of enterprises is still underdeveloped. This fact undoubtedly attracts the attention of researchers not only from a theoretical and methodological perspective but also from the practical aspect of managing enterprises in different sectors of the economy.

Research Methodology:
This article uses a set of systematic, structural, comparative, and financial analysis methods.

The research materials consist of statistical data and analytical comments, as well as articles on the research topic sourced from both Uzbek (unfortunately, there

are very few economic analyses by Uzbek scholars) and foreign scientific publications. The information and materials gathered during the preparation of the article are generalized and structured in accordance with the general requirements from the perspective of developing scientific and methodological foundations for the topic related to the prospects of developing the "Big Data" market and its tools.

Results and Discussion

In the modern world, business methods are constantly changing, mainly determined by economic development, information technologies, and globalization. At the same time, consumer demands are also changing. In modern conditions, to increase competitiveness, companies strive to have real-time knowledge about what and when their customers will buy, where they will purchase, and even what they will think before entering a marketplace or the company's website. In fact, Big Data technologies, which analyze various facts about customer behavior, can assist businesses in understanding consumer actions and the impact of this data on business analysis. Analyzing Big Data and business analytics are two different concepts, but today we are discussing their integration and mutual impact to develop businesses. In essence, the term "Big Data" refers to analytical work with large volumes of diverse data constantly updated from various sources to improve efficiency and competitiveness, as well as to create new products.

Currently, with the rapid development of the financial sector, the Big Data market is growing. By 2025, the global data volume is expected to increase tenfold, reaching 163 zettabytes, with most of this data being generated not by consumers but by enterprises. This is stated in the "Data Age 2025" report by IDC (International Data Corporation) and Seagate.

According to IDC, in 2018, the revenue from the Big Data and business analytics market was $168.8 billion. The report further states that by 2019, the Big Data market grew by 12%, reaching $189.9 billion, with more than half of the revenue coming from IT and business services. IDC also predicts that between 2018 and 2023, the compound annual growth rate (CAGR) for this market will rise by 13.2%, reaching $274.3 billion by 2022 (Figure 1).

According to experts, by 2025, 60% of the world's data will be created by businesses. Grand View Research forecasts that by 2025, the global Big Data as

a Service (BDaaS) market will reach $51.9 billion, with an average annual growth rate (CAGR) of 38.7%.

Given the significant role Big Data plays in modern business, let's look at some of the most important statistical data regarding Big Data's growing importance:

1.   In 2022, the Big Data market reached $274.3 billion.

2.   By the end of 2019, more than half of Big Data revenue came from IT and business services, amounting to $77.5 billion and $20.7 billion, respectively. The hardware segment generated approximately $23.7 billion in revenue, while revenue from Big Data software reached $67.2 billion.
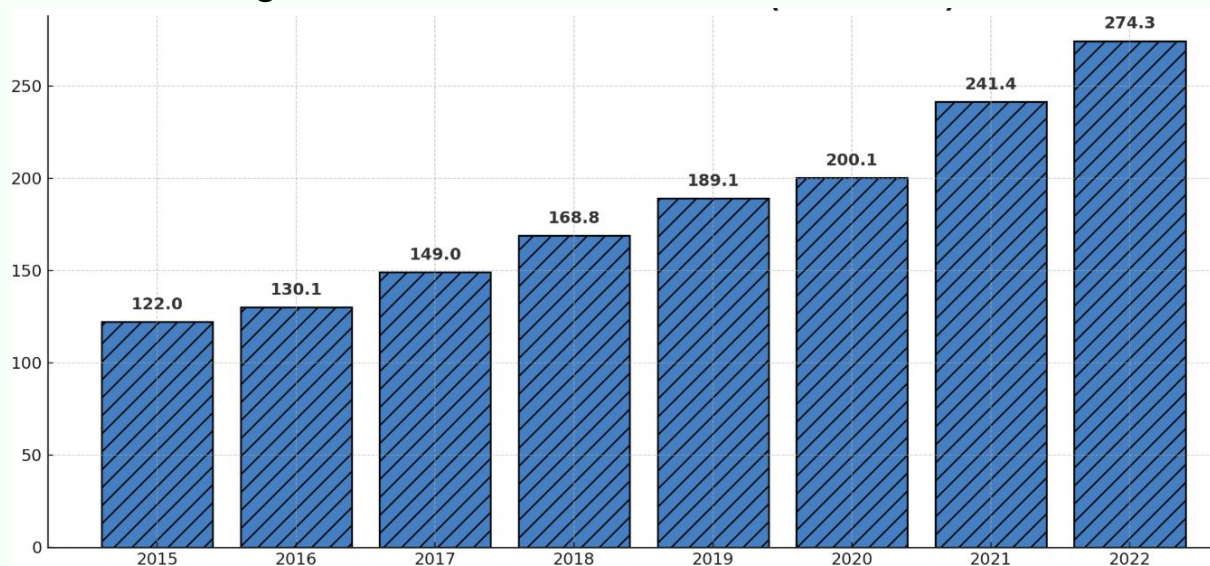
Figure 1. Growth Dynamics of the Big Data Market (billion USD)

In the article, systematic, structural, comparative, and financial analysis methods are used collectively. The research materials consist of statistical data and analytical comments, and articles on the research topic have been sourced from Uzbek (unfortunately, the economic analyses of Uzbek scholars are very few) and foreign scientific publications. During the preparation of the article, the data and information materials are generalized and structured from the perspective of the general requirements for developing scientific and methodological foundations on the research topic related to the prospects of developing the "big data" market and their tools.

Key Points:

1. In 2022, the big data market reached $274.3 billion.

2. By the end of 2019, half of the revenue from big data came from IT and business services, respectively $77.5 billion and $20.7 billion. The hardware segment earned approximately $23.7 billion, while software earned $67.2 billion.

3. By 2025, more than 150 zettabytes of big data will need to be analyzed.

4. In 2022, 24% of big data revenue came from software, 16% from hardware, and another 24% from services.

5. The volume of data created, replicated, and stored is expected to exceed 180 zettabytes by 2025.

According to IDC data, the growth rate (CAGR) in this segment is expected to increase by 12.5% between 2018 and 2023.

3. According to the research by Fortune Business Insights specialists, the global Big Data technology market, valued at $38.6 billion in 2018, is expected to reach $104.3 billion by 2026, with a CAGR of 14% between 2019 and 2026.

4. According to expert analysts, the annual revenue share of Big Data in software is predicted to reach $68.09 billion by 2025.

5. By 2025, over 150 zettabytes of Big Data will need to be analyzed.

6. In 2022, 24% of Big Data revenue came from software, 16% from hardware, and another 24% from services. The volume of created, replicated, and stored data is expected to exceed 180 zettabytes by 2025.

7. In 2022, the total amount of created and consumed data was 97 zettabytes (see Figure 2).
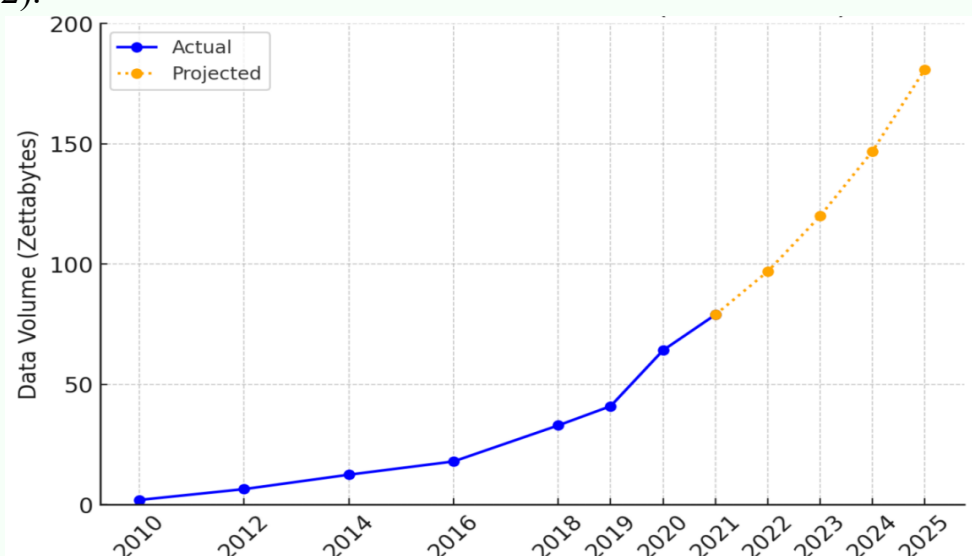
Figure 2. The growth dynamics of the volume of data created, copied, and stored worldwide

Digital Economy

Figure 2: Growth dynamics of the volume of created, replicated, and stored data worldwide.

By 2027, the use of Big Data and analytics solutions is projected to grow to $12 billion.

Let's look at the key characteristics of Big Data, which are described by three V's (words starting with V):

1.   **Volume**: Big Data consists of massive datasets measured in terabytes, petabytes, and even exabytes.

2.   **Velocity**: Data streams are created and updated at high speeds, requiring real-time or near-real-time processing.

3.   **Variety**: Data can be presented in various formats, such as structured (tables), semi-structured (logs), and unstructured (texts, images).

With the development of Big Data, two additional characteristics have emerged:

4.   **Veracity**: One of the data analyst's tasks is to differentiate between reliable and unreliable data.

5.   **Value**: The significance of data is defined by its application.

In some cases, a sixth characteristic, **Viability**, is highlighted, referring to the sustainability of data use.

Big Data specialists emphasize that the importance of these characteristics lies in the fact that not only volume is critical, but also the ability to identify its relevance, timeliness, and applicability.

Elements of Big Data Analysis:

1. **Data Diversity**:

o   Structured: Data that is easy to store and analyze, such as tables in relational databases.

o   Unstructured: Data without a fixed format, such as text, images, and videos.

o   Semi-structured: A combination of structured and unstructured data, such as XML and JSON files.

2. **Data Volume**:

o   Big: Very large datasets that traditional tools cannot handle.

o   Rapidly growing: Data volume continuously increases, requiring new processing methods.

o   Diversity: Data can come from various sources, necessitating integration before analysis.

Big Data and Market Drivers: According to IDC data, five industries account for nearly half (91.4 billion dollars) of investments in Big Data, with the largest market growth coming from retail (15.2% CAGR) and securities and investment services (15.3% CAGR).

Today, the growth of the Big Data technology market is led by companies like Amazon, IBM, Microsoft, Oracle, Dell Technologies, C Systems Inc., Cloudera Inc., Salesforce.com Inc., Teradata, Tableau Software, Hewlett-Packard, Prolifics, Inc., Xplent, Clairvoyant, Teradata, EquBot Inc., VMware Inc., Databricks, SAS Institute, Germany's SAP SE and Software AG, Japan's Fujitsu Limited and CMIC Co. Ltd., India's Infosys Limited, China's Huawei Technologies Co. Ltd., and the UK's Deloitte Touche Tohmatsu Limited.

Conclusion

In addition to platforms that ensure direct interaction between people (People-to-People, P2P), future developments will also focus on platforms that enable communication between people and machines (People-to-Machine, P2M) and between machines (Machine-to-Machine, M2M). The development of the Internet of Things (IoT), both consumer and industrial, and Big Data processing technologies will allow manufacturers to optimize the use of existing resources, streamline technological processes, reduce various costs and downtime, and quickly address emerging problems and malfunctions.

Despite the concept of Big Data, modern companies should not necessarily aim to process "all available data" to improve the quality of economic analysis. Experts suggest that the most effective results in economic analysis and forecasting models come from using Big Data in conjunction with business intelligence (BI). The accuracy of analytical models depends not on the volume of the analyzed data, but on the quality of the sampling and its relationship with the complexity of the model.

The real value of Big Data integration with BI lies in the ability to create effective models for smaller clusters, based on segments of available data. This method allows businesses to address specific economic analysis tasks more effectively.

According to research, the challenges in implementing Big Data methodologies in local economic analysis include:

- The ambiguity of Big Data terminology and its development.
- A shortage of skilled personnel for deep business analysis.
- A lack of expertise in managing and interpreting Big Data in relation to business goals and strategic management decisions.

There is still a shortage of qualified specialists required to implement Big Data initiatives, including mathematicians, direct business analysts, data modeling experts, statisticians, and various other researchers.

According to IDC analysts, these factors significantly contribute to the development of a new phase in Big Data, where business analysis for Big Data through BI outsourcing services will see further market growth. The "vacuum" in the human resources market and the shortage of essential fundamental knowledge are forcing more and more companies to engage providers who offer services for analyzing Big Data business needs and to partially outsource these processes.

The information provided above confirms that the development of methodologies for integrating business intelligence and Big Data technologies into modern organizations' economic analysis is taking place in an environment of high risks. This emphasizes the need for both theoretical-methodological and practical studies on this issue.

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