УДК 004.65:004.738.5:005.7

BIG DATA TECHNOLOGIES IN BUSINESS PROCESS AUTOMATION

M.Ya. Mansurova
Associate professor of Department of
«Convergence of digital technologies» TUIT, PhD
m.ya.mansurova@gmail.com

M.Ya. Mansurova
She graduated from the Tashkent University of Information Technologies named after Muhammad al-Khwarizmi. Associate professor of the Department of " Convergence of digital technologies " of TUIT. PhD. Conducts research on algorithms and adaptive models of an extensive multiparametric e-business management system.

Abstract. Big data is a set of vast useful information that cannot be read by standard computational structures. Big data is not just data, it has become an entire field that includes a set of tools, contexts and structures. It uses complex data sets to choose direction, course, and conduct direct management within organizations. By refining and performing computations, important structures can be derived that are necessary to accurately and deeply understand the findings through the exploration of organizational data. In this study, we have examined the features of Big Data technologies in business process automation. And also analyzed the peculiarities of applying Big Data technologies in the process of automating technological and business processes in the enterprise.

Key words: business process, automatization, big data, e-commerce, e-business.

Introduction. Big Data is becoming an important component of modern business, offering advantages in decision making, process optimization and innovation. Big Data is a term that plays an important role in modern business. It is a technology that allows collecting, storing and analyzing huge amounts of data. Initially, it was introduced to describe data that was too big and complex to process using traditional methods. In today's business, Big Data is used to generate useful information and strategic actions. Big Data offers many benefits to businesses. First, it allows organizations to make more informed decisions. For example, a company can use Big Data to analyze customer behavior to improve its products or services. Second, Big Data helps in optimizing business processes. Companies can use this data to identify problems in processes and fix them. Finally, Big Data promotes innovation. By analyzing the data, companies can identify new opportunities and trends, which helps in business development.

Today, data is one of the most important components of society and every individual's life. The modern stage of society development is characterized by a constant increase in the volume of data. Data comes from many different sources, such as data from GPS navigators, satellites,

Internet queries, social networks, data from IoT (Internet of Things). The structure and composition of this data is often undefined.

Big Data (big data) has the following properties: huge size, heterogeneity and disorderedness, requires fast processing. Big Data technologies are a set of tools, approaches and methods for processing both structured and unstructured data of huge size for further use.

Major Big Data technologies and tools include:

– Hadoop & MapReduce;

– NoSQL databases;

– Advanced analytics (statistics, predictive analytics and Data Mining, linguistic text processing);

– Data Discovery class tools.

The practical implementation of Big Data technologies is modern neural networks and systems derived from them, such as pattern recognition systems, simulation modeling, machine learning, and predictive analytics. Big Data technologies are widely used in the banking sector, telecommunications, industry, healthcare, energy, insurance and trade. Big industry has been collecting huge amounts of data for many years to improve product quality and production efficiency.

Analysis of Big Data technology application in automatization of business processes.

Technologically, the functioning of a highly automated (including extensive use of industrial robotics) digital enterprise is summarized as follows. With the help of Internet of Things technologies, huge amounts of information are collected in physical space and sent to cyberspace, where they are analyzed with the help of artificial intelligence. The results of this analysis are returned back to the physical dimension, and here management decisions are made on their basis.

Big Data technologies make it possible to automate technological and business processes, which leads to an increase in the speed of business response to external and internal disturbances. The economic effect is achieved by increasing the transparency of processes, improving the quality of planning, implementing widespread management by deviations (or goals), increasing the efficiency of determining the causes of deviations, constant normalization and standardization of best practices. The implementation of Big Data has a very specific goal - the realization of a dynamic business management model that ensures a rapid business response to external and internal perturbations. If perturbations occur in the system, be it instability in sales, variations in production, deviations in supply, the adaptive business management model allows the business to quickly «reconfigure» in accordance with the best strategy, which provides it with a cardinal increase in competitiveness. Moreover, the adaptive business management model uses instabilities, variations, deviations to continuously improve the structure and parameters of the business.

The general scheme of application of Big Data technologies in the process of automation of technological and business processes at the enterprise is shown in the figure 1.

Manufacturers install sensors on key parts of equipment to collect information in real time. The received and processed data are sent to all departments of the enterprise to ensure interaction between structural units and make appropriate management decisions.

This information can be used to improve service (downtime prevention, equipment breakdowns), to create targeted marketing offers.

Continuous monitoring of key indicators makes it possible to identify problems and take the necessary measures to solve them. Modern systems make it possible to monitor the technological process and identify factors affecting it using any Web browser. Such solutions make it possible to turn production data into information necessary for effective enterprise management.
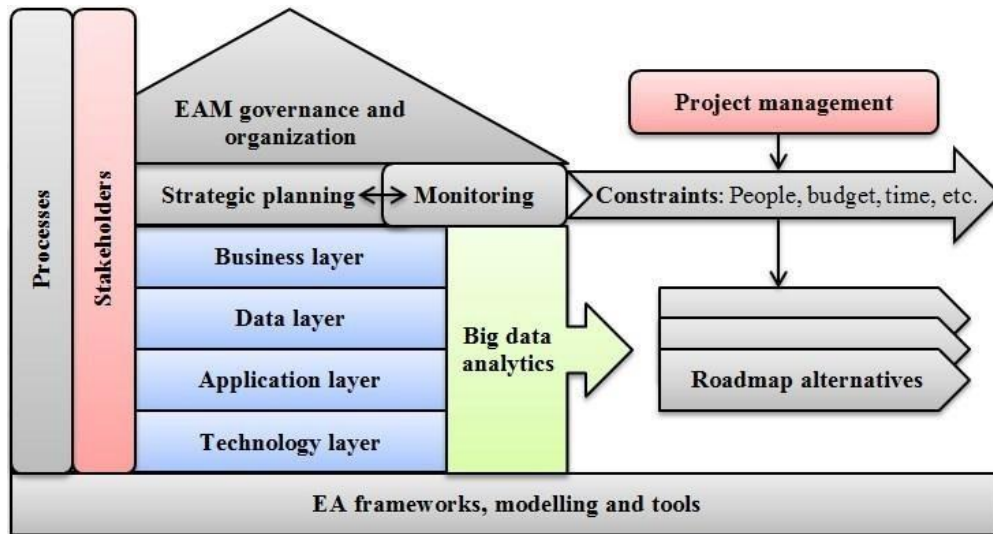
Figure 1. Big Data technologies in the process of automation of business processes

The following can be named as the main stages of Big Data technologies implementation in the automation of technological and business processes:

Data extraction from sources (most of the data is generated at the level of sensors, ACS, MES, ERP). Data storage (appropriate data storage independent of production servers. Data processing (normalization of data so that «agile analytics» tools, statistical control and analysis, numerical modeling can be applied later).

Data analytics. "Flexible analytics" allows you to easily and quickly organize client-oriented analytics for yourself with the help of wizards. That is, any trained employee customizes for himself the reporting he needs for his work: reports, graphs, histograms, regressions, Schuchart maps. Thus, the efficiency of data analysis in business is dramatically increased.

Big Data technologies as a key component of the Industrial Internet of Things are already widely used in many enterprises, allowing workers to improve their existing skills and the enterprise to function more efficiently.

The use of Big Data in business can be diverse. For example, retailers can use Big Data to analyze customer behavior and optimize assortments. Manufacturers can use Big Data to monitor production processes and prevent failures. Banks and insurance companies can use Big Data to assess risks and make decisions about loans or insurance policies.

The application of Big Data has a number of problems. The main one is the cost of data processing, which includes expensive equipment and the cost of salaries for qualified specialists capable of handling huge amounts of information. The second problem is bias. If a study provides not 2-3, but numerous results, it is very difficult to remain objective and select from the general data flow only those that will have a real impact on the state of a phenomenon. The third problem is the protection of Big Data. Methodologies for the protection of information systems of classical three-tier architecture are not applicable to new technologies. There is a need to create and train a new class of Big Data security specialists.

Conclusion. In conclusion, Big Data is a powerful tool that can help businesses become more competitive. It enables companies to make more informed decisions, optimize business processes and foster innovation.

Big Data technologies are now quite a working set of technologies used in almost all spheres of human activity and with great potential for further development.

The implementation of Big Data technologies requires not only technical support, but also organizational support. The first implies organization of data extraction, data warehouse, unified

workstations for analysis, digital modeling, optimization and forecasting. The second direction will require the formation of appropriate qualifications in the Big Data business. Specialists with new qualifications of «data engineers», «data scientist» for modeling, optimization and forecasting are needed. In addition, Big Data training of technologists, planners, managers from business will be required.

References

[1] Tsyrelchuk, I. N. Optimization of business processes via Big Data / I. N. Tsyrelchuk, N. M. Mamatova, M. Y. Abdul-Azalova // BIG DATA and Advanced Analytics = BIG DATA и анализ высокого уровня: сб. материалов VI Междунар. науч.-практ. конф., Минск, 20-21 мая 2020 года: в 3 ч. Ч. 1 / редкол. : В. А. Богуш [и др.]. – Минск : Бестпринт, 2020. – С. 96–104..

[2] Yashnarovna, A. A. M. Issues of Creating an Intelligent Automated Business Process Management System. European Multidisciplinary. Journal of Modern Science, 4, 691-697.

[3] Mansurova, M. Ya. "Some issues of Big Data application in modeling business processes of e-business systems." (2023).

[4] D Muhamediyeva, M Abdul-Azalova Evaluation Of The Efficiency Of The Business Processes Of The Enterprise. Scientific Collection «InterConf», 2022.

author's contribution

Mansurova Makhina Yashnarovna – examined the features of Big Data technologies in business process automation, analyzed the peculiarities of applying Big Data technologies in the process of automating technological and business processes in the enterprise.

ТЕХНОЛОГИИ BIG DATA В АВТОМАТИЗАЦИИ БИЗНЕС-ПРОЦЕССОВ

М. Я. Мансурова
Доцент кафедры
«Конвергенция цифровых
технологий» ТУИТ, PhD

Аннотация. Большие данные – набор огромной полезной информации, которая не может быть прочитана с помощью стандартных вычислительных структур. Большие данные – это не только данные, они уже стали целой областью, которая включает набор инструментов, контекстов и структур. Она использует сложные наборы данных для выбора направления, курса и проведения непосредственного управления внутри организаций. С помощью усовершенствования и выполнения вычислений могут быть получены важные структуры, необходимые для точного и глубокого понимания полученных результатов через исследование данных организации. В этом исследовании мы изучили особенности применения технологий Больших данных в автоматизации бизнес процессов. А также проанализированы особенности применения технологий Big Data в процессе автоматизации технологических и бизнес – процессов на предприятии.

Ключевые слова: бизнес-процесс, автоматизация, большие данные, электронная торговля, электронный бизнес.