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BIG DATA TECHNOLOGIES IMPLEMENTATION IN E-PAYMENT SYSTEMS



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Abstract. Big data is a collection of vast amounts of useful information that cannot be read with standard computational structures. Big data is more than just data; it has become an entire field of tools, contexts, and structures. They use complex data sets for direction, course selection, and direct management within organizations. This article discusses the process of application of electronic payment systems using Big Data technologies, identifies the main stages of implementation of Big Data technologies in these systems, analyzes the experience of implementation and prospects of Big Data technologies.

Keywords: Big Data, e-commerce, e-business, digital economy, Blockchain, cryptocurrency, financial safety, electronic payment.

Introduction.

One of the directions of development of financial technologies may be the introduction of the Big Data concept for the country's financial sector. The transition to this concept implies the development of data processing centers with the receipt and analysis of information obtained not from the documents provided directly by individuals and legal entities, but through electronic payments. At the same time the government will have access to reliable information, which will allow for making more accurate and informed strategic decisions, reducing the level of corruption, while increasing the transparency of information about the companies. Implementation of Big Data systems in the public e-payment systems will significantly speed up the process of obtaining statistical information. Now reports of the Central Bank on some indicators, which can be collected just technically, are released with a delay of several months to several quarters, with the improvement of information tools, private companies that use official statistics will have more flexibility tools in the decision-making process. The formation of a single information space on financial indicators will create a unified environment between the state, business and the population [1].

An important aspect of implementing Big Data in the public e-payment systems is ensuring data security and developing the right clustering and hierarchy of data access. With e-commerce payment processing solutions, there's a set order process you can follow to keep a steady cash

flow alongside a trustworthy sales procedure. This is below so you understand each step in the compliance procedures:

PO Creation: Purchase orders are approved or prepared.

Purchase Order Approval: After a PO is made, it's sent to sign-off.

PO Dispatch: When the PO is approved, they're sent to a selected vendor.

Binding Contract: There's a contract created when the vendor takes on the PO.

Goods Delivery: The vendor delivers the goods.

PO Closure: An invoice is forwarded to close the transaction.

There are many advantages of e-commerce payment systems.

These include: reducing your business' paperwork load; reducing the costs of transactions; reducing the labor costs; lower transaction costs; high security standards from a payment gateway provider; it's user friendly for employees and customers; it's less time-consuming than a manual payment system; it helps your business to scale-up and expand your market reach.

There are also downsides to consider. As they're familiar with credit cards and paper checks, it may be a slight shock to the system to have to adapt following decades spent using cards. But you can get around this to provide support to customers unsure about using your new system. You can: provide guides to assist those new to the technology; offer customer support guidance to talk them through any issues; highlight the convenience and security benefits of your new system; ultimately, there's always going to be an overlap of customers adapting/struggling with your new approach to payments [2].

As long as you offer the support they need, you can increase churn rates and improve customer acceptance of the new methods. Choosing an e-Commerce Payment Processor Choosing a secure platform that's right for your business and customers is one of the big keys to your success. This process can vary, depending on your business and the type of processes you want to follow, but it's a standard example of what happens during a transaction—from start to finish.

The delineation of rights of access to financial information requires a clear definition of boundaries. Here it is important to define at the legislative level the completeness of information disclosure by the state. In general, the state can and should receive full information about financial transactions of individuals and legal entities, as a minimum to get a quick, accurate and objective situation in the country. This will allow to make optimal decisions and react flexibly to changing external and internal conditions of the financial market. But in this case there is a question about the protection of human rights and freedoms and the inability to use data for personal purposes [3].

It is also important for private companies to have access to broad financial information in order to do business properly and compete with foreign companies. However, the level of access to information may already be reduced because private companies do not have significant obligations to the public. There is also the question of creating developmental competition and the absence of monopoly. The development of Big Data systems now forces large companies to allocate substantial funding for the modernization of their information systems and the introduction of new software products. At the same time, the creation of state repositories of big data entails the further improvement of methods of analysis and processing of information, as the data collected and the information obtained from them are completely different concepts. In the issue of countering monopoly it is important to establish that companies with state participation will not be able to get access to more information than other companies, as this would give them significant advantages and the possibility of using insider information for profit.

Materials and methods.

Experts believe that the changes in modern industry (some of which are already taking place) that 'digital manufacturing' implies will take place in the following key areas:

- Digital modelling - the concept of a digital twin, i.e. manufacturing a product in a virtual model that includes equipment, production process and plant personnel, is developing.

- "Big Data" (Big Data) and business intelligence that emerges from the manufacturing process.

- Autonomous robots, which will gain greater industrial functionality, independence, flexibility and execution ability than the previous generation.

- Horizontal and vertical systems integration - most of the huge number of information systems currently in use are integrated, but there needs to be greater collaboration at different levels within the enterprise as well as between different businesses.

- The Industrial Internet of Things, where information from a large number of sensors and equipment coming from production is networked together.

One of the hallmarks of 'digital manufacturing' is the presence of an intelligent control system, i.e. the ability to tightly integrate existing process equipment and obtain a wide range of process information from anywhere in the production ecosystem [4].

Today, data is one of the most important components of society and every person's life. The modern stage of society is characterised 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, and data from the IoT (Internet of Things). The structure and composition of this data is often not defined. Big Data (Big Data) has the following properties: huge size, heterogeneity and disorderliness, require 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.

The main 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.

Practical implementation of Big Data technologies are modern neural networks and derivative systems based on them, such as pattern recognition systems, simulation modelling, machine learning and predictive analytics. Big Data technologies are widespread in the banking, telecommunications, industry, healthcare, energy, insurance and trade sectors. Large industry has been collecting huge amounts of data for many years to improve product quality and production efficiency [2]. The main materials for research on the subject area are: a sample of scientific and professional works of domestic authors in the field of Big Data technologies, processing of huge amounts of data, Internet resources on the subject under study. The research methods are comparative and system analysis, logical approach.

Results.

Blockchain is a new, but so far costly, national technology that can be used to securely store and process data. Blockchain is a distributed database whose storage devices are not connected to a common server. Thus, this database will store an ever-growing volume of information in the form of ordered block records. At the same time, each block will refer to the previous block, which may be stored in a completely different place. Thus, the distribution of access keys, according to the developed hierarchy, will allow to delimit the level of access to information by the state, private companies and individuals. At the same time, the use of the production capacities of companies and individuals will reduce the economic costs of implementing the new system (Figure 1.). It is important to establish the degree of control over the system and the technology, as only government regulation can lead to excessive bureaucracy on the one hand and lagging behind foreign partners and corporations on the other [5].

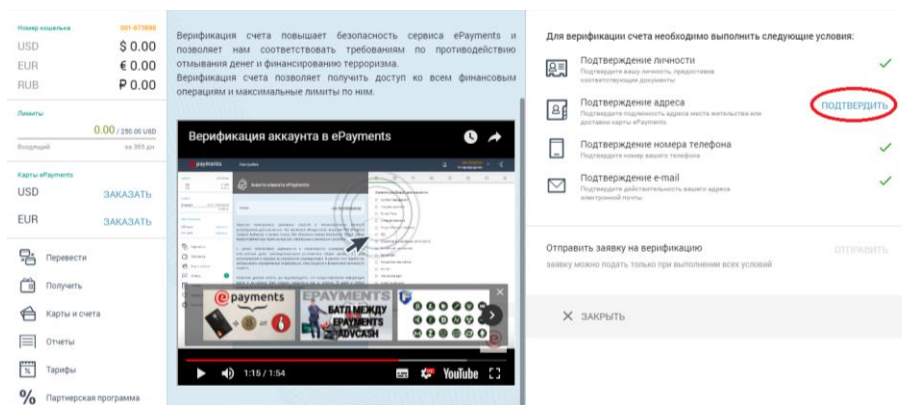


Figure 1. Blockchain based based e-payment systems

Blockchain technology is now being used to create cryptocurrencies (Figure 2), which are already having a huge impact on financial markets, leading to the simplification of transactions and the elimination of many "unnecessary" transactions. This is due to the fact that by using blockchain technology and cryptocurrencies as a monetary unit, payment can now not be tied to a specific bank account, when one way or another there is a physical movement of funds. The cryptocurrency market is now established, and the main issue now is its official recognition at the national and international level. Today, there is significant volatility in cryptocurrencies, and therefore it is dangerous for the Central Bank to conduct operations with them [6].

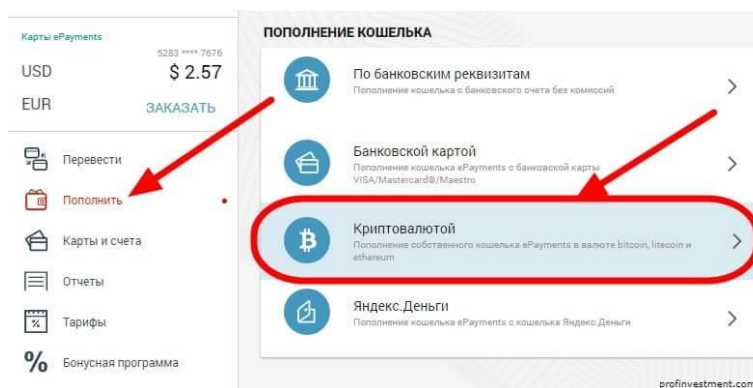


Figure 2. Cryptocurrencies based e-payment systems

The application of blockchain technology not only to create cryptocurrencies, but also to form a new large-scale Big Data base is advisable as a consequence of counteracting international interference and unscrupulous partners obtaining financial information about domestic companies and government services. At the moment, blockchain technology is as secure as possible, as the data is not stored on a single server, information from which can be illegally obtained by third parties. In addition, the formation of a new financial information system Big Data will contribute to the further informatization of the population, and the penetration of Internet technology among the population [7].

Conclusion. Thus, the development of e-payment systems is not possible without the development of financial information technology, taking into account the harmonization of the interests of all stakeholders and the consolidation of labor, organizational and financial resources of business and government.

Big Data technologies are now quite a workable set of technologies used in almost all areas of human activity and have great potential for further development.

Unfortunately, according to experts, Uzbekistan is still about 3-5 years behind the leading countries of the world in the use of Big Data technologies. The reasons for this lag are the low level of automation, the scattered nature of the data being collected, and the insufficient number of real projects. Technologies used in the West cannot always be adapted to the Uzbek reality. In addition, there is an obvious shortage of Big Data specialists.

The introduction of Big Data technology requires not only technical support, but also organisational support. The first involves organizing data extraction, data storage, unified workstations for analysis, digital modeling, optimization and forecasting. The second direction will require the formation of appropriate qualifications in the Big Data business. Professionals with the new qualifications of "data engineers", "data scientist" for modelling, optimisation and forecasting are needed. In addition, training of Big Data technologists, planners and managers from business will be required.

Nevertheless, the potential of the Uzbek big data market is enormous and in the coming years its rate of development will be many times higher than that of the global market.

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ОПТИМИЗАЦИЯ БИЗНЕС ПРОЦЕССОВ ПОСРЕДСТВОМ BIG DATA

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Аннотация. Большие данные - это совокупность огромной полезной информации, которая не может быть прочитана с помощью стандартных вычислительных структур. Большие данные - это не просто данные, они уже стали целой областью, включающей в себя набор инструментов, контекстов и структур. Они используют сложные наборы данных для выбора направления, курса и непосредственного управления внутри организаций. В данной статье рассматривается процесс применения электронных платежных систем с использованием технологий Big Data, определяются основные этапы внедрения технологий Big Data в данных системах, анализируется опыт внедрения и перспективы технологий Big Data.

Ключевые слова: Big Data, электронная коммерция, электронный бизнес, цифровая экономика, Blockchain, криптовалюта, финансовая безопасность, электронные платежи.