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QUALITY MANAGEMENT CONCEPT IN THE CONTEXT OF DIGITALIZATION

КОНЦЕПЦИЯ УПРАВЛЕНИЯ КАЧЕСТВОМ В КОНТЕКСТЕ ЦИФРОВИЗАЦИИ

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Abstract. This article presents the results of a study of changes in quality management under the influence of the digital transformation of enterprises. Information on the practical implementation of blockchain technology in areas close to solving the problem of improving the quality management system is briefly reviewed. Their successful implementation confirms the possibility of using this technology to solve the problem of managing transaction costs, as well as informing all participants in the market exchange process. The proposed technology can be used in the formation of a system for informing the end consumer of the quality management system about the current state of the quality of goods and services in the consumer market.

Аннотация. В данной статье представлены результаты исследования изменений в управлении качеством под влиянием процесса цифровой трансформации предприятий. Кратко рассмотрена информация о практической реализации технологии блокчейн в областях, близких к решению задачи совершенствования системы менеджмента качества. Их успешная реализация подтверждает возможность использования данной технологии для решения задачи управления транзакционными издержками, а также информирования всех участников рыночного обменного процесса. Предложенная технология может быть использована при формировании системы информирования конечного потребителя системы менеджмента качества об актуальном состоянии качества товаров и услуг на потребительском рынке.

The previous technologies under human control are being replaced by artificial intelligence and machine (IT) control technologies – cloud solutions, the Internet of Things (IoT), machine learning, artificial intelligence,

blockchain, predictive analytics, virtual and augmented reality, etc. Digital transformation affects an increasing number of areas of activity of each enterprise or organization. Quality management issues are not left aside. The "prospect" or desired results of digital transformation in this area are improving the quality of a product or service, compliance with regulatory requirements, improving the decision-making process, increasing the efficiency of activities while reducing risk [1].

At the present stage of development, quality management uses many well-known IT technologies that allow achieving these goals: electronic document management (EDM systems), enterprise resource planning (ERP systems), customer relationship management systems (CRM), business process management (BPM), etc.

Digital transformation suggests taking the next step – transferring manual quality management operations to digital form. There are many tasks in quality management that require significant human resource expenditures, for example, collecting and analyzing data on products, processes and organization systems, monitoring and managing processes, making decisions based on actual data, identifying and analyzing risks, etc.

The main direction of solving the problem of improving the quality management system at the present stage is the creation of equal information conditions for the manufacturer, large retailer and end consumer; reducing transaction costs by disclosing their structure and content to the entire range of stakeholders. Transaction costs should become as accessible and transparent as possible. Moreover, the transition of the world economy to the active phase of digitalization makes this problem practically solvable [2].

The basic technologies of digitalization, which can be used as a basis for a modern quality management system, include cloud computing, big data, cognitive technologies, and distributed ledger (chain of transaction blocks/Block Chain).

Let's take a closer look at the latter methodology. In translation, Block Chain is a chain of blocks that are assigned a certain sequence. The essence of the methodology is to build distributed databases, each record of which contains information about the history of ownership, making it extremely difficult to falsify it (information). The chain of blocks is constantly growing, each new block is added to its end, without changing the contents of the previous ones, but adjusting the final information.

Blockchain is a single protected data registry presented in the form of electronic files. Accordingly, one block can be copied and write off information many times. It is possible to build different types of services on this technology. In particular, it is possible to organize both private and public services.

Private blockchain is mainly used for the functioning of private businesses. It is closed, centralized and subordinate to the goals of the organization. Its maintenance and control are carried out by the creators themselves.

It is opposed to a public blockchain. Anyone can join such systems, they are administered by the community itself. However, this does not mean that it is completely open and unprotected. There is a decentralized server that ensures security and uninterrupted operation in this case, putting timestamps and providing peer-to-peer network connections. Such chains of blocks are usually used to register events, data transactions, manage identification and confirm the authenticity of the source.

Currently, the number of commercial projects based on blockchain technology in various fields of industry, trade, transport, and medicine is steadily growing. Let's consider some of them.

Provenance – founded in 2014 in London (UK). It is designed to strengthen customer trust in brands and retailers by providing key information about each product: materials, ingredients, suppliers, production processes, equipment used, storage conditions, transportation, and much more. Each stage of the product's life cycle is tracked and recorded on the blockchain, after which this information is verified and made publicly available. The full "history" of a product can be viewed using the Provenance app or integrated into the company's website as electronic receipts, or issued via URL and/or QR code.

ShipChain: an Ethereum-based logistics platform founded in 2017 in Los Angeles (USA). Focused on cargo transportation, it allows tracking the transportation of goods from the moment of shipment from production to the final transfer to the customer. Member of the Blockchain in Transport Alliance (BiTA). Promotes the product for widespread use by freight forwarding companies. Uses the immutability and decentralization of blockchain technology and IoT devices. To collect information about the movement and conditions of cargo transportation in real time, it creates a "history" of the life cycle. Allows you to automate logistics processes related to data exchange, document flow and financial settlements.

Waltonchain: IoT software founded in 2016 in Shenzhen, China. It is one of the enterprise-level logistics and supply chain solutions that integrate RFID and IoT data into the blockchain. It is well supported in China and other Southeast Asian countries.

TE-Food: is engaged in food tracking. Founded in 2015 in Albstadt, Germany. It unites producers, distributors, retailers and consumers of food products to eliminate fraud in the food industry and reduce companies' logistics costs. It uses RFID tags to track the time and place of food production, the conditions under which raw materials are produced, and the time of delivery to the supermarket. All information is recorded in the blockchain and provided to the buyer via QR codes.

MediLedger: its task is the logistics of medical drugs. The platform was developed in 2017 in San Francisco (California, USA). Tracks the origin of pharmaceuticals in accordance with the rules of the Drug Supply Chain Security Act (DSCSA). Focused on storing synchronized public data, guaranteeing all

network participants a common "source of truth"; ensures the confidentiality of data on transactions; uses smart contracts to ensure compliance with business rules and the execution of transactions within the system. Maximally protects the personal data of users, guarantees that they will not be published, transferred, sold or used without the knowledge and consent of their source. Information in the MediLedger network is not available even to the Chronicled manager, unless their source wants it.

Briefly considered information on the practical implementation of blockchain technology in areas close to solving the problem of improving the quality management system. Their successful implementation confirms the possibility of using this technology to solve the problem of managing transaction costs, as well as informing all participants in the market exchange process. Consequently, the proposed technology can be used in the formation of a system for informing the end consumer of the quality management system about the current state of the quality of goods and services in the consumer market.

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DYNAMICS OF FOREIGN TRADE BALANCE OF CLOTHING GOODS IN BELARUS

ДИНАМИКА ВНЕШНЕТОРГОВОГО САЛЬДО ТОВАРОВ ОДЕЖДЫ БЕЛАРУСИ

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