COMPLEX OF INFORMATION SERVICES IN E-COMMERCE

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ABSTRACT

Information services in e-commerce can be understood as an integrated set of digital tools, data-processing mechanisms, communication platforms, and analytical systems that support commercial transactions, customer interaction, logistics coordination, marketing, and managerial decision-making. Unlike traditional information support systems, modern e-commerce information services operate in real time, rely heavily on data analytics and artificial intelligence, and are deeply embedded in value creation processes. Therefore, managing them as a fragmented set of tools is ineffective; instead, they must be conceptualized and governed as a unified complex with interdependent elements and coordinated objectives

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The second group of elements of the e-commerce system that characterize the variety of organizational forms that can be used include: electronic store; electronic department store; electronic kiosk; electronic auction; electronic storefront; electronic store of settlements; electronic market of third countries; virtual community (<community); consulting firm; brokerage information office or a separate broker; research service providers.[1]

An electronic store is a kind of shop window providing a user-friendly interface, a web server offering goods or services for sale. The main criterion for the effectiveness or successful functioning of such a store is the real volume of satisfied demand for goods or services.

Issues of e-commerce performance indicators, e-business and e-commerce management were studied by Nazarova I. B., Dianova T. V [4], Manyika J. M., Roberts R. P., Sprague K.L. [5], Vershinina S.V. [6], Zueva O.N., Donskova L.A.[7] and others.

An electronic department store functions similarly to a traditional department store, where multiple businesses offer a variety of products. The primary indicator of its effectiveness is often the strength and recognition of the product brand or its overall image.

An electronic kiosk, also known as an interactive kiosk, refers to an internet-connected hardware-software system that grants users interactive access to various services and information. Typically, such kiosks include a computer with a hard drive, keyboard, CD-ROM, and a monitor equipped with audio and video cards. Users can interact with the system through multiple input methods—keyboards, microphones, cameras, or magnetic card readers—either individually or in combination. These kiosks enable full Internet functionality, including browsing websites, using search engines and databases, sending and receiving emails, and completing online forms.

According to a study by Frost & Sullivan, electronic kiosk revenue reached $369.7 million in 1996 and was projected to grow to $2.94 billion by 2003.

An electronic auction is the digital counterpart of a traditional auction, leveraging internet technologies. This format predominantly aligns with the Customer-to-Customer (C2C) e-commerce model, although Business-to-Business (B2B) versions also exist. Examples include commodity exchanges and energy auctions, especially prevalent in the United States and Western Europe. These platforms often create online communities of users with shared interests—such as collectors of rare books or niche products. Transaction values at Western e-auctions typically range from $35 to $80. In the Russian-speaking digital space, platforms like Molotok.ru enable users to buy and sell a wide range of products. However, such auctions face legal limitations, including the absence of electronic signature legislation in Russia and limited usage of bank cards for secure identification of participants—unlike Western auctions, where card verification is mandatory.

Electronic auctions rely heavily on multimedia interfaces and internet access, as visual presentation of goods is essential. Auctions function as competitive marketplaces, with sellers aiming for the highest price and buyers seeking the lowest. These can be categorized based on bid direction—ascending from a minimum to a winning maximum, or descending from a set maximum to a minimum bid.[8]

The methodological foundation for managing a complex of information services in e-commerce should be based on a systems approach. From this perspective, the information service complex represents an open socio-economic and technological system interacting continuously with external environments such as consumers, suppliers, regulators, and digital infrastructure providers. The system includes input flows (data, user requests, market signals), transformation processes (data processing, analytics, algorithmic decision-making), and outputs (services, recommendations, transactions, managerial insights). Effective management requires ensuring coherence between these components while maintaining flexibility to respond to environmental changes.

A key methodological principle is the integration of strategic and operational management levels. At the strategic level, management focuses on defining long-term

objectives for information services, aligning them with the overall e-commerce business model, and determining priorities such as customer orientation, data security, scalability, and innovation. Strategic decisions include selecting technological architectures, defining data governance policies, choosing platform models, and determining investment directions in digital infrastructure. At the operational level, management addresses day-to-day coordination of information flows, system performance, service quality, and responsiveness to user behavior. The methodological challenge lies in ensuring that operational processes consistently support strategic goals through measurable indicators and feedback mechanisms.

Another essential component of the methodology is the functional structuring of the information services complex. In e-commerce, information services typically encompass several interrelated functional blocks: data collection and integration, data storage and management, analytics and decision support, user interaction interfaces, transaction processing, and security and compliance. Each block performs a specific role, yet their effectiveness depends on seamless integration. For example, data collected from user interactions and transactions must be accurately stored and processed to generate analytics that support personalization, pricing strategies, and inventory management. Therefore, the methodology must define functional boundaries while ensuring interoperability through standardized protocols and shared data models.

Data management constitutes a central pillar of the proposed methodology. E-commerce platforms generate vast volumes of structured and unstructured data, including transaction records, browsing behavior, customer feedback, and external market information. Effective management requires establishing clear procedures for data acquisition, validation, classification, storage, and retrieval. A methodological approach should emphasize data quality management, ensuring accuracy, completeness, consistency, and timeliness. Without reliable data, analytical outputs lose credibility, leading to suboptimal managerial decisions. Moreover, data governance frameworks must define ownership, access rights, and accountability to ensure ethical and lawful use of information.

Analytical and decision-support components form another critical dimension of the information services complex. Modern e-commerce increasingly relies on advanced analytics, machine learning, and predictive modeling to forecast demand, optimize pricing, personalize recommendations, and manage risks. Methodologically, these tools should be embedded into a coherent decision-support architecture rather than applied in isolation. This involves defining decision-making levels (strategic, tactical, operational), identifying relevant indicators for each level, and linking analytical outputs to concrete managerial actions. The methodology should also account for model validation, transparency, and continuous improvement, recognizing that algorithms must adapt to changing market conditions and consumer behavior.

The management of information services in e-commerce also requires attention to organizational and human factors. Despite high levels of automation, effective functioning depends on qualified personnel capable of designing, operating, and interpreting information systems. The methodology should therefore incorporate principles of organizational design, defining roles and responsibilities related to information management, such as data analysts, system administrators, digital marketers, and cybersecurity specialists. Coordination

mechanisms, communication channels, and competency development programs are essential to ensure that human resources complement technological capabilities. Furthermore, fostering a data-driven organizational culture enhances the practical use of information services in managerial decision-making.

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