

BIG DATA AND ANALYTICS: THEIR ROLE IN OPTIMIZING INFORMATION SYSTEM MANAGEMENT IN COMMERCE

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Abstract. In today's environment of rapid technological advancement, information systems (IS) serve as both a data processing tool and a foundation for informed decision-making across all spheres. IS are essential in modern business, offering comprehensive approaches to adopting best management practices, especially in commerce—an economic sector vital for national economic growth.

Commercial enterprises regularly handle diverse data sources: transaction records, customer behavior analytics, social media data, customer feedback, and supply chain information. Big Data in commerce is characterized by three core elements: 1) data volume; 2) speed of generation; 3) diversity of data, which improves business processes but requires advanced analytics for large-scale data processing.

The analysis and processing of Big Data exceed the capabilities of traditional data management tools. Modern IS in commerce now analyze significant data volumes, facilitating customer behavior monitoring, inventory management, sales trend analysis, and customer engagement. Big Data analytics not only enables data processing but also reveals patterns and trends, enhancing the adaptability of IS to market changes and boosting resilience to economic fluctuations.

However, the high costs and stringent security demands of integrating Big Data in IS are critical for commerce. Systems meeting advanced data security standards contribute to the efficient operation of commerce through the following systems:

1. *Inventory Management Systems:* These systems track stock levels and logistics costs, preventing overstock or shortages. Big Data supports inventory management by enabling demand forecasting through historical data analysis, allowing businesses to optimize storage costs and ensure stock availability when needed.

2. *Customer Relationship Management (CRM) Systems:* CRM systems gather and analyze data on customer preferences and purchase histories, enabling service personalization and customer behavior insights. Through Big Data analytics, CRMs can create tailored offers and forecast customer needs based on purchase trends, facilitating long-term customer relationships.

3. *Point of Sale (POS) Systems:* POS systems automate sales processes and collect transaction data for analysis, aiding in optimizing sales strategies. Big Data from POS systems helps identify optimal moments for promotions and product launches, guiding decisions on commercial activities.

4. *Enterprise Resource Planning (ERP) Systems:* ERP systems integrate trade operations like procurement, logistics, and financial transactions, ensuring consistent and transparent operations. Big Data in ERP supports effective management of resources and allows businesses to anticipate procurement needs, enhancing business coherence.

In conclusion, Big Data improves decision-making efficiency, enables prompt market responsiveness, and supports long-term growth.

Keywords: Big Data; decision-making; information systems.

References:

1. Vasylenko V.V., Yermolenko V.O., Chychkaryev E.A., Samodryga O.A. Analysis of customer relationship management information systems for wholesale and retail enterprises. *Scientific notes of State University of Applied Sciences* 2023. No. 2(4). P. 96-100. DOI: 10.31673/2518-7678.2023.021212
2. Grosul V.A., Shinkarenko I.A. Information technologies and digital transformation in the system of adaptive development of retail enterprises. *Economy: realities of time. Scientific journal*. 2023. No. 1 (65). P. 86-94. Mode of access to the magazine: <https://economics.net.ua/files/archive/2023/No1/86.pdf>. DOI: 10.15276/ETR.01.2023.11. DOI: 10.5281/zenodo.10185084.
3. Adaga Ejuma, Okorie Gold, Egieya Zainab, Ikwue Uneku, Udeh Chioma, DaraOjimba Donald, Oriekhoe Osato. The role of big data in business strategy: a critical review. *Computer Science & IT Research Journal*. 2024. No. 4. pp. 327-350. 10.51594/csitrj.v4i3.686.
4. Masoud R., Basahel S. The Effects of Digital Transformation on Firm Performance: The Role of Customer Experience and IT Innovation. 2023. No. 3. pp. 109–126. <https://doi.org/10.3390/digital3020008>.
5. Pizło W., Kulykovets O., Prokopowicz D., Mazurkiewicz-Pizło A., Kałowski A., Paprocka M.W., Skarzyńska E. The importance of Big Data Analytics technology in business management. *Cybersecurity and Law*. 2023. No. 10(2). pp. 270-282. <https://doi.org/10.35467/cal/174940>.