Nanotechnologies in construction
Нанотехнологии в строительстве
2024; 16 (5): 431–440

Nanobuild.ru

THE RESULTS OF THE SPECIALISTS' AND SCIENTISTS' RESEARCHES

Review article
https://doi.org/10.15828/2075-8545-2024-16-5-431-440

Advancing Decision-Making: The Role of Management Analytics in Modern Business Practices

Y. Lu[1]*, Zhanna V. Pisarenko[2], Lei Yang[3], Leonid A. Ivanov[4], Chengang Ye[5]

[1] Beijing Technology and Business University, Beijing, China
[2] Saint-Petersburg State University, Saint-Petersburg, Russia
[3] Shenyang University of Technology, Shenyang, China
[4] Russian Academy of Engineering, Moscow, Russia
[5] University of International Business and Economics, Beijing, China

* Corresponding author: e-mail: ziiyuu@gmail.com

ABSTRACT

Introduction. Management analytics is an evolving field that has gained substantial traction in both academia and industry due to its profound impact on decision-making processes. The inte-gration into decision making of advanced information technologies and AI drive innovative solutions within management analytics. **Evolution of Management Analytics.** The discipline integrates statistical analysis, predictive modeling, and data visualization to optimize business strategies, operational efficiency, and financial performance. As management practices advance, they contribute new dimensions to data collection and analysis, presenting unique opportunities to boost nanotechnologies. **Methodological Advances in Management Analytics.** This study explores the transformative effects of management analytics across diverse sectors by illustrating its evolution and interpreting its methodologies with special focus on nanotechnologies. **Applications in Different Sectors.** Management analytics significantly enhances decision-making through sophisticated data analysis, offering strategic insights that propel efficiency and competitiveness. The use of management analytics in nanotechnologies raises questions regarding ethical implications and regulatory considerations. **Challenges and Future Directions.** However, integration complexities, data security, and the need for skilled personnel pose ongoing challenges. **Conclusion.** This review provides insights into the potentials of the development of management analytics and its importance in contemporary management.

KEYWORDS: Management Analytics, decision making, data analytics, management science.

FOR CITATION:
Lu Y., Pisarenko Zh.V., Yang L., Ivanov L.A., Ye C. Advancing Decision-Making: The Role of Management Analytics in Modern Business Practices. *Nanotechnologies in Construction*. 2024; 16(5): 431–440. https://doi.org/10.15828/2075-8545-2024-16-5-431-440. – EDN: MDCKFD

INTRODUCTION

Management analytics encapsulates a comprehensive approach for understanding and leveraging data within the managerial contexts. It enables organizations to harness information assets to drive strategic decisions and achieve competitive advantage. In an era marked by digital transformation and an overwhelming volume of data, the ability to analyze and interpret complex datasets has become crucial for businesses aiming to thrive in dynamic markets [1, 2].

Management analytics has emerged as a pivotal approach in controlling data for strategic decision-making across various sectors. It integrates techniques from operations research, statistics, and machine learning to analyze business processes, thereby enhancing operational efficiency and strategic outcomes. This field specifically targets managerial applications of data, aiming to optimize the use of resources, improve service delivery, and boost performance across all levels of an organization [3, 4, 5].

The scope of management analytics is broad, encompassing a range of applications from supply chain operations to customer relationship management and human resources. It involves the systematic use of data to drive decisions in a way that adds value to businesses. By applying analytics, organizations can achieve more precise fore-

casting, improved risk management, and better resource allocation, leading to increased operational effectiveness and competitive advantages in the marketplace [6, 7].

In practice, management analytics is integrated deeply into various business functions. It aids in identifying patterns and insights within large volumes of data, helping managers to make informed decisions. For instance, in supply chain management, analytics can optimize inventory levels and enhance the efficiency of logistics operations.

Similarly, in marketing, it can analyze consumer behavior patterns to tailor products and services to meet the demands of the market more effectively [8, 9, 10].

The advancement of technology has significantly expanded the capabilities of management analytics. Modern tools and platforms powered by artificial intelligence and machine learning algorithms enable the handling of big data sets, providing insights that were previously unattainable. These technologies facilitate real-time data processing and visualization, allowing managers to react promptly to emerging trends and operational challenges [11, 12].

Management analytics significantly contributes to organizational decision-making by integrating extensive data analysis to enhance operational and strategic out-comes. This field employs advanced statistical and computational methodologies to extract actionable insights from large datasets, enabling businesses to optimize processes, reduce costs, and improve overall efficiency. In various sectors, from healthcare to retail, management analytics facilitates better re-source management, predictive maintenance, customer relationship management, and more, driving innovation and competitive advantage. The realtime data processing capabilities of management analytics also support dynamic decision-making, helping organizations to respond more swiftly and effectively to changing market conditions. Thus, management analytics emerges as a crucial tool for modern businesses, providing a foundation for data-driven strategies that foster growth and sustainability [13, 14, 15].

The structure of the paper is as follows. Section 2 illustrates the evolution of management analytic. Section 3 interprets its methodologies. Section 4 explores its applications. Section 5 identifies prevalent challenges and future trajectory. Section 6 concludes the paper.

EVOLUTION OF MANAGEMENT ANALYTICS

The concept of management analytics has roots in traditional business intelligence and statistical analysis, evolving over the decades through advancements in computational technologies and analytics software. This evolution has been marked by a shift from simple descriptive analytics to complex models that predict future trends and behavior, thereby enabling proactive management strategies [16, 17].

Management analytics initially grew out of the broader field of business intelligence, rooted in statistical analysis and data management. Historically, it focused primarily on descriptive analytics, which involved reporting previous data to inform management when making decisions. This phase was characterized by the use of basic statistical tools and manual data collection methods, aimed at simplifying vast amounts of business data into understandable reports [18, 19].

As computing technology has been advancing in the late 20th century, management analytics began to incorporate more sophisticated software tools, leading to the development of decision support systems [DSS]. These systems used historical data to provide in-sights and support more complex decision-making processes. The availability of more robust computational resources allowed for the processing of larger datasets and the use of more complex mathematical models [20].

The introduction of predictive analytics marked a significant evolution in management analytics. By leveraging statistical models and forecasting techniques, businesses could not only interpret historical data but also predict future trends. This capability transformed management practices by enabling proactive rather than reactive decision-making, using methods such as regression analysis, timeseries forecasting, and later machine learning techniques [21].

The big data revolution in the early 21st century further propelled the evolution of management analytics. The integration of big data technologies with management analytics tools allowed for the handling of unstructured and semi-structured data, enhancing the analytical capabilities of organizations. Machine learning algorithms became increasingly important, providing new ways to analyze data and automate complex decision-making processes [22].

Today, management analytics is heavily influenced by advancements in artificial intelligence [AI] and deep learning. These technologies allow for even more sophisticated analysis, such as sentiment analysis, image recognition, and natural language processing, which can be used to glean insights from data that was previously inaccessible for analysis. AI-driven analytics supports real-time decision-making and offers predictive insights with a high degree of accuracy [23].

The field of management analytics is poised for further growth with the integration of IoT [Internet of Things] and more advanced AI capabilities. These developments promise to deliver more comprehensive, automated, and nuanced analytics solutions. However, challenges such as data privacy, ethical concerns related to AI, and the need for significant computational resources remain. The future of management analytics will depend on how effectively these challenges are addressed and how seamlessly new technologies can be integrated into existing analytical frameworks [24].

METHODOLOGICAL ADVANCES IN MANAGEMENT ANALYTICS

Recent methodological advances in management analytics involve sophisticated algorithms and machine learning techniques that offer deeper insights into data than ever before. Techniques such as data envelopment analysis, machine learning models, and network analytics have revolutionized how businesses approach problems in areas such as logistics, human resources, and customer relationship management

Statistical Analysis and Optimization

Initially, management analytics relied heavily on statistical methods and linear programming to optimize operations and predict outcomes. These methods provided a foundation for decision-making by identifying trends and optimizing resource allocation [25].

Advent of Machine Learning and Artificial Intelligence

The introduction of machine learning and artificial intelligence marked a pivotal shift in management analytics. These technologies allowed for the automation of data analysis processes and enabled more accurate predictions by learning from data with-out explicit programming [26].

Big Data Analytics

As organizations began to handle vast amounts of data, big data analytics emerged as a critical methodological advance. Tools and frameworks like Hadoop and Spark facilitated the processing of large datasets, al-lowing for more granular insights into business operations [27].

Predictive Analytics and Its Impact

Predictive analytics has transformed management analytics by allowing business-es to anticipate future trends and behaviors. Techniques such as regression analysis, time series analysis, and machine learning models have been crucial in forecasting customer behavior, sales trends, and supply chain needs [28, 29].

Real-Time Analytics

The ability to analyze data in real-time has greatly enhanced management analytics' responsiveness. Technologies that support streaming data have enabled businesses to make informed decisions swiftly, adapting to changes as they occur [30].

Cloud Computing and Analytics

Cloud computing has democratized access to powerful analytics tools, providing scalability and flexibility. This advancement has allowed even small enterprises to lever-age sophisticated analytics without the need for significant hardware investments. The current generation of computers and hi-tech sector require nanotechnologies to create smarter and more compact electronic devices. With a cloud architecture, fewer computers, hardware, and IT services are required, but demand is focused on the efficiency and smaller size of data-centers equipment [45].

Integration of IoT with Management Analytics

The Internet of Things [IoT] has provided a new dimension to management analytics by enabling the collection and analysis of data from connected devices. This integration has been particularly transformative in industries like manufacturing and logistics. The Internet of Things has the potential to provide a vast amount of real-time data, which can be used in management analytics to enhance the efficiency of smart devices with nanotechnologies. For instance, nanosensors that can operate in harsh environments. In the future, integrating IoT with nanotechnology could lead to the creation of innovative smart devices. This integration has the potential to revolutionize various sectors, such as healthcare, manufacturing, energy, and agriculture. IoT in nanoscale manufacturing and energy harvesting has also shown promising results, but there are still challenges that need to be addressed.

Advanced Visualization Tools

Visualization tools have evolved to offer more interactive and intuitive ways to understand complex data sets. Tools like Tableau and Power BI help translate analytical results into actionable insights through dynamic dashboards and reports [31, 32].

These methodological advancements have collectively enhanced the strategic ca-pabilities of management analytics, enabling more precise and forward-looking insights that drive better business decisions. Each phase of evolution has built upon the previous, paving the way for a future where analytics is deeply embedded in management practices. Decision-making in risk management is usually based on high-quality analysis of big data is of much importance for the insurance industry. The innovative fintech developments such as of Peak3 could become the drivers of profound changes on an established market. Peak3 supports life, health, and P&C insurance, and has been adopted by leading insurers and digital platforms. With the new funding, Peak3 will accelerate its capabili-

ties in data processing and artificial intelligence. Recent achievements include the launch of a multi-country insurance core system and issuing over a billion policies globally, marking significant progress in its mission to modernize the insurance industry.[1]

Applications in Different Sectors

The application of management analytics spans numerous sectors including finance, healthcare, retail, and manufacturing. Each sector benefits uniquely; for instance, healthcare institutions implement analytics to improve patient outcomes and optimize treatment paths, while retail businesses use analytics to understand consumer behavior and enhance personalization. Management analytics has revolutionized various industries by providing data-driven insights that enhance efficiency, profitability, and strategic planning. Its applications are diverse, spanning sectors from healthcare and finance to retail and manufacturing. In risk management AI and Big Data can help banks in detecting and preventing fraud, money laundering, cyberattacks, and other risks by analyzing large volumes of data and identifying patterns, anomalies, and such behaviors. Cyber-security is an application of AI that is specifically designed to protect computer networks, programs, and data from attacks, illegal access, amendments, or destruction [21].

Healthcare

In healthcare, management analytics is used to improve patient outcomes through predictive models that assess risk factors and predict patient trajectories. It helps in resource allocation, staff scheduling, and personalized patient care plans, thereby increasing operational efficiency and patient satisfaction [33]. All this will lead to an improvement in the quality of life for the population through the introduction of new technologies for monitoring and diagnosing health, the organization of an efficient health system, and the reduction of budget expenditures through better analysis and monitoring of health data [46]. To a greater extent, improving the quality of life can also be associated with the widespread use of nanotechnology in medicine for the crea-tion of various nanoparticles with unique properties, such as high mechanical strength, resistance to chemical influences, and surface activity, thanks to the peculiarities of their structure. These properties make it possible to create new materials and devices based on them, which can suc-cessfully treat the most complex diseases. At the stage of development and evaluation, the use of management analytics tools will significantly reduce the time required for risk assessment and patient satisfaction analysis.

Finance

The financial sector leverages management analytics for risk assessment, fraud detection, and customer segmentation. By analyzing transaction patterns and customer behavior, banks can offer tailored services, enhance security measures, and optimize their financial products.

Predictive analytics, social banking, behavioral finance and open banking are some of the creative and new services that financial institutions offer, made possible by big data and artificial intelligence tools. For example, artificial intelligence helps banks identify data on customer preferences and promptly offer solutions on demand [23]. In the financial sector, digital technologies and analytics are transforming the very business model of service provision. Ecosystem-oriented platform services are being formed, including all segments of the financial market [banking, insurance, investment segment, pension segment] radically changing the interaction between the financial service provider and the client. The services themselves are becoming more complicated, and the risks of fraud are increasing. It is in managing such a risk and reducing it that the role of management analytics is seen in the near future.

Retail

In retail, management analytics optimizes inventory management, enhances customer relationship management, and predicts consumer buying behaviors. Retailers use these insights to tailor marketing strategies, optimize supply chains, and improve customer experiences [34, 35].

Manufacturing

Manufacturing industries employ management analytics to streamline production processes, reduce downtime, and enhance quality control. Predictive maintenance models predict equipment failures before they occur, significantly reducing unplanned downtime and maintenance costs [36]. The most promising use of management analytics in the production sector can be demonstrated by the example of the development of new materials using nanotechnology. But new materials based on nanotechnology carry not only advantages, but also risks. At present, it is difficult to unambiguously characterize various nanoparticles from the point of view of their potential danger to human health. Often contradictory data from a few studies do not allow to make an informed decision without using management analytics methods.

[1] https://fintech.global/2024/09/11/singapore-based-peak3-secured-the-largest-asian-insurtech-deal-as-funding-rounds-halved-in-h1/

Supply Chain and Logistics

Management analytics transforms sup-ply chain operations by optimizing routes, reducing transportation costs, and improving delivery times. It enables companies to respond dynamically to supply chain disruptions and manage inventory more efficiently [37, 38].

Education

In the education sector, management analytics helps institutions in student retention strategies, curriculum development, and resource allocation. By analyzing student data, educational institutions can identify at-risk students, tailor educational offerings, and improve educational outcomes.

Energy

Energy companies use management analytics to optimize power generation and distribution. Predictive models help in forecasting demand, managing load, and integrating renewable energy sources, thus ensuring efficient energy management and reducing operational costs. The efficiency of global energy companies in their business lines [upstream, downstream, midstream] can be supported by artificial intelligence and big data by reducing information asymmetry and transaction costs. For example, artificial intelligence is becoming a tool that helps service companies with the processing necessary information in the shortest possible time, reducing the number of errors and extra costs.

Agriculture

In agriculture, management analytics aids in crop yield prediction, soil health monitoring, and resource optimization. Data-driven insights help farmers make informed decisions about planting, harvesting, and resource allocation, leading to increased productivity and sustainability. On the basis of management analytics a large number of nanomaterials with specified properties have been created to avoid friction and wear of parts, which extends the service life of tractors and other agricultural machinery. Currently, the work is underway to develop sorbents based on nanotechnology for the prevention of toxicosis of various natures, reducing man-made pressure on the human and animal body [47].

Telecommunications

Telecom companies apply management analytics to enhance network performance, predict system failures, and improve customer service. By analyzing call data records, companies can improve network coverage, reduce churn rates, and enhance customer satisfaction [39, 40].

Real Estate

The real estate sector uses management analytics for market analysis, property valuation, and investment risk assessment. Real-time data analysis helps in predicting market trends, optimizing pricing strategies, and identifying profitable investment opportunities [41].

Tourism and Hospitality

In tourism and hospitality, management analytics is crucial for optimizing booking systems, personalizing customer experiences, and managing facilities. Predictive analytics help in forecasting demand, which assists in revenue management and staffing.

Sports

Sports organizations use management analytics for player performance analysis, injury prediction, and fan engagement strategies. By analyzing game data, teams can enhance player performance, reduce injury risks, and improve game strategies."Nano-high-tech" solutions today are available not only to sports professionals. Big data technologies and generative AI allow us to go further. Nanorobots can interfere with natural biochemical processes to achieve higher athletic performance – it's still a concept, but experiments with nanocapsules capable of releasing active substances in the right place at the right time are already underway. Another wide field for the use of nanotechnology and artificial intelligence is sports pharmacology. Scientists are experimenting with nanocapsules [molecules in the structure of which active substances are enclosed] capable of releasing their contents in the right place at the right time. For example, oxygen released during peak loads or drugs that are not considered doping and that "improve" biochemical processes in the body can be used as an active substance.

Government and Public Sector

In the public sector, management analytics is used for urban planning, public safety, social insurance, and resource allocation. Data-driven insights help in traffic management, crime prediction, and efficient public resource management. Management analytics makes it possible to use advances in nanotechnology that help decrease the harmful impact of various pollutants on the environment: for example, the collection and processing of big data for this science provides new opportunities for recycling solid municipal waste in large urban ag-

glomerations, water purification, determination of toxic elements, etc.

Across all these sectors, management analytics plays a pivotal role in transforming data into actionable insights that lead to improved decision-making and enhanced operational efficiencies. As data continues to grow in volume and complexity, the role of management analytics in driving industry innovations and improvements is only set to increase.

CHALLENGES AND FUTURE DIRECTIONS

Management analytics, despite its robust growth and widespread adoption across various industries, faces significant challenges. These challenges stem primarily from the rapid evolution of data technologies, the in-creasing complexity of data, and the heightened expectations for data-driven decision-making in real-time environments.

Data Quality and Integration

A primary challenge in management analytics is the quality and integration of data. Organizations often struggle with disparate data sources that are siloed and inconsistent. The difficulty in integrating these data sources can lead to incomplete analytics and potentially misleading outcomes that could affect strategic decisions [42].

Privacy and Security Concerns

As data privacy laws become more stringent globally, organizations must navigate the complexities of data compliance while striving to leverage data for analytics. Ensuring privacy and securing data against breaches while maintaining the utility of analytics systems is a significant challenge that requires ongoing attention and innovation [43].

Skill Gap and Talent Acquisition

The skill gap in data science and analytical expertise is another critical challenge. The demand for professionals who can interpret complex data and derive insights exceeds the supply. This gap can hinder the implementation of effective management analytics, as organizations struggle to recruit and retain qualified personnel. As new technology-related occupations emerge, there is a growing demand for more skilled personnel. The key in-demand areas are data scientists, business analysts, data engineers. To meet these growing needs, upskilling is paramount.

Future Directions: AI and Automation

Looking ahead, the integration of artificial intelligence [AI] and automation in management analytics is seen as a promising direction. AI can address many of the current challenges by enhancing data processing capabilities, generating more accurate predictions, and providing deeper insights into complex datasets [44].

Ethical Implications and Governance

As AI becomes more integrated into management analytics, ethical implications and governance will come to the forefront. Organizations will need to establish clear policies and frameworks to govern the ethical use of AI and analytics, ensuring that decisions derived from such systems are transparent, fair, and accountable. Artificial intelligence should not deprive humans of their role in the intellectual sphere. On the contrary, we have opportunities to reconsider the established ideas about human knowledge and learning. This will become the basis for uniting the efforts of society, which can lead to the creation of a future digital environment focused on people and accessible to everyone.

CONCLUSION

The documents reviewed underscore the multifaceted role of management analytics in enhancing organizational performance across various sectors, showcasing its pro-found impact on operational efficiency, strategic decision-making, and competitive ad-vantage. Through the evolution of analytics methodologies from basic statistical approaches to advanced machine learning and AI integration, management analytics has not only adapted to the complexities of modern data but also driven significant business transformations. However, challenges such as data privacy, the analytical skills gap, and the need for continuous technological advancements persist, demanding robust solutions. As management analytics continues to evolve, it will be pivotal for organizations to address these challenges and leverage the latest innovations to stay competitive in a data-driven world. This dynamic interplay of innovation and adaptation highlights the ongoing significance of management analytics in shaping the future of business practices globally.

REFERENCES

1. Sigov, A., Ratkin, L., Ivanov, L.A. et al. Emerging Enabling Technologies for Industry 4.0 and Beyond. Inf Syst Front (2022). https://doi.org/10.1007/s10796-021-10213-w

2. Lu Y, Sigov A, Ratkin L, Ivanov LA, Zuo M. Quantum computing and industrial information integration: A review. Journal of Industrial Information Integration. 2023 Aug 23:100511. https://doi.org/10.1016/j.jii.2023.100511

3. Sigov A, Ratkin L, Ivanov LA. Quantum information technology. Journal of Industrial Information Integration. 2022 Jul 1;28:100365. https://doi.org/10.1016/j.jii.2022.100365

4. Li X, Sigov A, Ratkin L, Ivanov LA, Li L. Artificial intelligence applications in finance: a survey. Journal of Management Analytics. 2023 Oct 2;10(4):676-92. https://doi.org/10.1080/23270012.2023.2244503

5. Pisarenko Zh.V., Kuznetsova N.P., Mitin S.G. Financial Convergence and Financial Conglomerates in the Global Economy. Saint Petersburg; 2011.

6. Ivanov L.A., Xu L.D., Bokova E.S., Ishkov A.D., Borisova O.N. Inventions in the area of nanomaterials and nanotechnologies. Part I. Nanotechnologies in Construction. 2022; 14(1): 18–26. https://doi.org/10.15828/2075-8545-2022-14-1-18-26

7. Ivanov LA., Razumeev K.E., Bokova E.S., Muminova S.R. The inventions in nanotechnolo-gies as practical solutions. Part V. Nanotechnologies in Construction. 2019, Vol. 11, no. 6, pp. 719–729. https://doi.org/10.15828/2075-8545-2019-11-6-719-729

8. Ivanov LA., Prokopiev P.S. The inventions in nanotechnologies as practical solutions. Part IV. Nanotechnologies in Construction. 2019, Vol. 11, no. 4, pp. 447–457. https://doi.org/10.15828/2075-8545-2019-11-4-447-457

9. Ivanov L.A., Xu L.D., Bokova E.S., Ishkov A.D., Muminova S.R. Inventions of scientists, engineers and specialists from different countries in the area of nanotechnologies. Part I. Nanotechnologies in Construction. 2021; 13(1): 23–31. https://doi.org/10.15828/2075-8545-2020-13-1-23-31

10. Ivanov LA., Prokopiev P.S. The inventions in nanotechnologies as practical solutions. Part III. Nanotechnologies in Construction. 2019, Vol. 11, no.3, pp. 292–303. https://doi.org/10.15828/2075-8545-2019-11-3-292-303

11. Ivanov L.A., Xu L.D., Muminova S.R., Feoktistova V.M., Romanova E.V. Inventions in the area of nanomaterials and nanotechnologies. Part II. Nanotechnologies in Construction. 2022; 14(2): 105–112. https://doi.org/10.15828/2075-8545-2022-14-2-105-112

12. Ivanov L.A., Xu L.D., Pisarenko Zh.V., Nguyen C.T., Muminova S.R. Inventions of scien-tists, engineers and specialists from different countries in the area of nanotechnologies. Part IV. Nanotechnologies in Construction. 2021; 13(4): 242–251. https://doi.org/10.15828/2075-8545-2021-13-4-242-251

13. Ivanov L.A., Xu L.D., Pisarenko Zh.V., Wang Q., Prokopiev P.S. Inventions of scientists, engineers and specialists from different countries in the area of nanotechnologies. Part II. Nano-technologies in Construction. 2021; 13(2): 79–89. https://doi.org/10.15828/2075-8545-2021-13-2-79-89

14. Ivanov L.A., Demenev A.V., Muminova S.R. The inventions in nanotechnologies as practical solutions. Part II. Nanotechnologies in Construction. 2019, Vol. 11, no. 2, pp. 175–185. https://doi.org/10.15828/2075-8545-2019-11-2-175-185

15. Ivanov L.A., Xu L.D., Razumeev K.E., Feoktistova V.M., Prokopiev P.S. Inventions of scientists, engineers and specialists from different countries in the area of nanotechnologies. Part V. Nanotechnologies in Construction. 2021; 13(5): 311–318. https://doi.org/10.15828/2075-8545-2021-13-5-311-318

16. Ivanov LA., Borisova O.N., Muminova S.R. The inventions in nanotechnologies as practical solutions. Part I. Nanotechnologies in Construction. 2019, Vol. 11, no. 1, pp. 91–101. https://doi.org/10.15828/2075-8545-2019-11-1-91-101

17. Ivanov L.A., Xu L.D., Pisarenko Zh.V., Muminova S.R., Miloradova N.G. Inventions in the area of nanotechnologies and nanomaterials. Part I. Nanotechnologies in Construction. 2023; 15(1): 37–47. https://doi.org/10.15828/2075-8545-2023-15-1-37-47. – EDN: PPOMEI.

18. Ivanov L.A., Xu L.D., Muminova S.R., Ishkov A.D., Demenev A.V. Inventions in the area of nanomaterials and nanotechnologies. Part III. Nanotechnologies in Construction. 2022; 14(6): 466–474. https://doi.org/10.15828/2075-8545-2022-14-6-466-474. – EDN: QGCTUF.

19. Razmanova S.V., Machula I.A., Pisarenko Zh.V. Modeling of forecast prices for liquefied natural gas for China. Gas industry. 2015; 8 (726):19-24.

20. Nazarov V.G., Ivanov L.A., Dedov A.V., Bokova E.S., Statnik E.S. Gradient non-woven fabrics with a modified surface nanolayer for water filtration in construction industry. Nanotechnologies in construction. 2023; 15(2): 117–123. https://doi.org/10.15828/2075-8545-2023-15-2-117-123. – EDN: ASVYVS.

21. Titov V.O., Dostov V.L., Pisarenko Zh.V., Lvova N.A., Krivoruchko S.V., Shust P.M., Vashchuk A.E. The Role of Modern Financial Technologies in Overcoming Barriers to Access to Retail Financial Services. Economics and Entrepreneurship. 2024; (170): 483-489.

22. J.F. Fan, A. Sigov, L. Ratkin, L.A. Ivanov, S.W. Chen, C.M. Zhang. Acquisition and cognition information of human body swing. Journal of Industrial Information Integration. 2022; 30:100391. https://doi.org/10.1016/j.jii.2022.100391

23. Pisarenko Zh.V. Features of Bank Insurance in Russia: Protection of the Interests of Consumers of Complex Financial Services. Actual problems of economics and law. 2013; 2: 140-146.

24. Davenport, Thomas H. Competing on analytics. Harvard business review. 2006; (84:1): 98.

25. Hsieh P.H. Exploratory analysis of grocery product networks. Journal of Management Analytics. 2022; (9:2): 169-184.

26. Arishi C., Krishnan K. A multi-agent deep reinforcement learning approach for solving the multi-depot vehicle routing problem. Journal of Management Analytics. 2023; (10:3): 493-515.

27. Dehkhodaei A., Amiri B., Farsijani H., Raad A. Barriers to big data analytics (BDA) implementation in manufacturing supply chains. Journal of Management Analytics. 2023; (10:1): 191-222.

28. Karabağ O., Fadıloğlu M.M. Augmented Winter's method for forecasting under asynchronous seasonalities. Journal of Management Analytics. 2021; (8:1): 19-35.

29. Das S., Mishra S., Senapati M. Improving time series forecasting using elephant herd optimization with feature selection methods. Journal of Management Analytics. 2021; (8:1): 113-133.

30. Fainshmidt, Stav, Witt M.A., Aguilera R.V., Verbeke A. The contributions of qualitative comparative analysis (QCA) to international business research. Journal of International Business Studies. 2020; (51): 455-466.

31. Liu X., Liu F., Li Y., Shen H., Lim E.T.K., Tan C.W. Image Analytics: A consolidation of visual feature extraction methods. Journal of Management Analytics. 2021; (8:4): 569-597.

32. Gao W., Jiang N., Gu F. Understanding the role of streamers in livestreaming commerce: a vocal–visual perspective. Journal of Management Analytics. 2023; (10:2): 247-269.

33. Liu Y., Fuller B., Hester K., Chen H.. Authentic leadership and employees' job performance: mediation effect of positive employee health. Journal of Management Analytics. 2023; (10:3): 566-582.

34. Malleeswaran B., Uthayakumar R. A single-manufacturer multiretailer sustainable reworking model for green and environmental sensitive demand under discrete ordering cost reduction. Journal of Management Analytics. 2023; (10:1): 109-128.

35. Bhavani G.D., Mahapatra G.S., Kumar A. An integrated fuzzy production inventory model for manufacturer–retailer coordination under simple carbon tax system. Journal of Management Analytics. 2023; (10:1): 38-88.

36. Maiti A.K. Cloudy fuzzy inventory model under imperfect production process with demand dependent production rate. Journal of Management Analytics. 2021; (8:4): 741-763.

37. Samanta B., Giri B.C., Chaudhuri K. A supply chain model with two competitive buyers under a hybrid greening cost and revenue-sharing contract. Journal of Management Analytics. 2023; (10:2): 270-307.

38. Latpate R., Bhosale M., Kurade S. Cold supply chain inventory models for agricultural products with multi-stage stochastic deterioration rates. Journal of Management Analytics. 2023; (10:3): 516-549.

39. Chen H., Li L., Chen Y. Sustainable growth research – A study on the telecom operators in China. Journal of Management Analytics. 2022; (9:1): 17-31.

40. Bansal G., Anand A., Aggrawal D. Modeling multigenerational diffusion for competitive brands: an analysis for telecommunication industries. Journal of Management Analytics. 2021; (8:4): 715-740.

41. Shi H., Ma Z., Chong D., He W. The impact of Facebook on real estate sales. Journal of Management Analytics. 2021; (8:1): 101-112.

42. Zhang S., Yan Y., Wang P., Xu Z., Yan X. Sustainable maintainability management practices for offshore assets: A data-driven decision strategy. Journal of Cleaner Production. 2019; 237: 117730.

43. Wang M., Feng X. Price squeeze under fairness: the road to supply chain coordination with a powerful retailer. Journal of Management Analytics. 2022; (9:4): 448-479.

44. Isupova O., Kuzin D., Mihaylova L. Learning methods for dynamic topic modeling in automated behavior analysis. IEEE transactions on neural networks and learning systems. 2017; (29:9): 3980-3993.

45. Paul P.K., Jayati Lahiri Dey Nanotechnology Vis-à-Vis Computing: With special references to cloud computing, big data management – A techno managerial knowledge study. Innovations in Power and Advanced Computing Technologies (i-PACT). 2017. https://doi.org/10.1109/IPACT.2017.8245151

46. Samsonova M.V. Nanomedicine: current approach to diagnosis and treatment of diseases and safety issues. Jour. Pulmonology. 2008; 6-12. https://journal.pulmonology.ru/pulm/article/viewFile/1842/1341

47. Tarasova E. Yu., Korosteleva V. P., Ponomarev V. Y. Application of nanotechnologies in agriculture. 2012; 21. URL: https://cyberleninka.ru/article/n/primenenie-nanotehnologiy-v-selskom-hozyaystve (Accessed: 11.09.2024).

INFORMATION ABOUT THE AUTHORS

Yang Lu – **PhD**, Professor of Management Science and Engineering, Beijing Technology and Business University, Beijing, China, zii-yuu@gmail.com, https://orcid.org/0000-0002-8400-3983

Zhanna V. Pisarenko – Dr. Sci. (Econ.), Professor, Saint-Petersburg State University, Faculty of Economics, Department of Risk Management and Insurance, Saint-Petersburg, Russia, z.pisarenko@spbu.ru, https://orcid.org/0000-0002-9082-2897

Lei Yang – PhD, student at Shenyang University of Technology, her research interest is block-chain-based supply chain finance, Shenyang, China, yanglei@smail.sut.edu.cn

Leonid A. Ivanov – Cand. Sci. (Eng.), Vice President of the Russian Academy of Engineering, Member of the International Journalist Federation; Moscow, Russia, L.a.ivanov@mail.ru, https://orcid.org/0000-0001-9513-8712

Chengang Ye – Professor, he is currently the Director of the Institute of Modern Ac-counting and Auditing at the University of International Business and Economics, the Director of the Daxin Au-dit Research Center, the Director of the Business Ethics and Corporate Social Responsibility Re-search Center, the Director of the Venture Capital Management Research Center, Beijing, China, yechengang@126.com

CONTRIBUTION OF THE AUTHORS

The authors contributed equally to this article.

The authors declare no conflicts of interests.

The article was submitted 16.08.2024; approved after reviewing 20.09.2024; accepted for publication 27.09.2024.