

UDC (004.94:005.334)::(001.8:37.09)

## Smart resilient management in higher education research in conditions of uncertainty

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**Abstract.** *Smart governance is a modern approach that combines innovative methods, digital technologies, artificial intelligence and data analytics to improve the performance of organizations in times of instability. In particular, smart governance of R&D in higher education is an innovative approach to organizing scientific activities. It uses digital platforms and predictive analytics to enable universities to proactively respond to crises, optimize resources and maintain high quality research. This approach contributes to increasing the resilience, innovative development and competitiveness of academic organizations. Key trends include digitalization, risk forecasting and integration of innovative practices.*

**Keywords:** *innovation, smart management, crisis management, research and development, higher education.*

### Introduction.

Innovative smart (intelligent) management is applied in EU sectors such as business, education, healthcare, public services, etc. - contributing to digital evolution and sustainable progress [1]. Innovative smart (intelligent) management contributes to strategic development, sustainable growth and increased competitiveness of organizations/institutions and enterprises [2], while allowing them to adapt to environmental changes and use new opportunities [3]. In general, innovative smart (intelligent) management represents a modern approach to the organization and development of projects, institutions and enterprises of the SAME in conditions of instability and crisis situations [4], [5]. It should be noted separately that innovative smart (intelligent) management synergistically combines innovative methods [6], digital technologies [7], artificial intelligence [8], [9] and data analysis [10] to increase adaptability, sustainability and efficiency. The use of predictive analytics [11], automation and cognitive systems [12] allows for proactive and optimal decisions, risk reduction and rapid response to environmental changes. This approach contributes to process optimization, service quality improvement and competitiveness of organizations/institutions [14]. Intelligent management is becoming a key tool for strategic planning and sustainable development in conditions of uncertainty [14] and crises [15], ensuring the ability of organizations to quickly adapt to crises and use new opportunities [16] to ensure operational efficiency and long-term sustainability in unstable and crisis environments.

### **The Main Part.**

Intelligent management of scientific research and development activities R&D in higher education is a comprehensive and innovative approach to the organization, coordination and strategic development of scientific and educational work of universities, research institutes and scientific and educational centers in conditions of instability, global crises and an uncertain external environment. This approach combines innovative management methods, digital technologies, analytical tools, artificial intelligence, big data and cognitive systems to ensure adaptability, resilience, reproducibility and continuity of research processes.

The use of predictive analytics, automation, digital platforms and intelligent systems allows universities to proactively respond to crisis situations, predict risks, optimize resource allocation and maintain high quality scientific research, educational programs and management decisions. Intelligent R&D management contributes to the formation of sustainable models of organizational and scientific activity, increasing the efficiency of interaction between research units, teachers and students, and also stimulates the introduction of innovations and technologies that increase the competitiveness and scientific potential of educational institutions.

Particular attention is paid to the integration of digitalization, innovation, strategic planning and management practices, which ensures synergy between scientific, educational and managerial activities. This allows the formation of systems of reproducible and scalable scientific activity, strengthening international cooperation, increasing the resilience of universities to external shocks and creating conditions for long-term development in the global scientific and educational space.

In general, intelligent R&D management in conditions of instability and crises acts as a key tool for ensuring strategic sustainability, innovative development and reproducibility of scientific and educational processes, contributing to the formation of highly effective, adaptive and competitive academic organizations.

### **Conclusions.**

Intelligent R&D management in higher education is a key tool for increasing the sustainability of universities, ensuring the reproducibility of research, optimizing resources and forming competitive and innovative academic organizations.

1. The importance of intelligent R&D management in higher education:

- Intelligent R&D management in higher education allows to increase the adaptability, efficiency and sustainability of universities in unstable conditions.
- The use of digital technologies, data analytics, artificial intelligence and cognitive systems contributes to the optimization of management processes, making proactive decisions and improving the quality of research and educational programs.

2. Trends in the development of intelligent R&D management in higher education:

- Digitalization and automation: implementation of intelligent platforms for monitoring and analyzing scientific activities.

- Forecasting and risk management: use of predictive analytics to assess and minimize crisis factors.
  - Integration of innovative practices: introduction of new methods of knowledge management, distance technologies and adaptive educational models.
  - Increasing the resilience of universities: formation of the ability to quickly recover from crisis situations and adapt to changes in the external environment.
3. Prospects for the development of intellectual management of R&D in higher education:
- Sustainable development of R&D: creation of reproducible and scalable models of scientific activity.
  - Integration of artificial intelligence and big data into the strategic management of scientific projects.
  - International cooperation and globalization: exchange of experience and data between universities to increase competitiveness.
  - Innovative educational models: adaptation of teaching and research to the needs of the labor market and rapidly changing technologies.
  - Synergy between management, various technologies [17] and strategy: ensuring the comprehensive development of university structures and long-term sustainability.

### References

1. Palyvoda O. O., Seliverstova, O. S. (2017). Management of innovative development of industry in the countries of the European Union based on the formation of cluster infrastructure. *Naukovyi visnyk Polissia*. 1(1(9)). 185–191 [In Ukrainian].
2. Mykytenko V.V., Hryshchenko I.S. (2008). Adaptive management system of innovative processes at enterprises. *Problems of science*, (4), pp. 32-37.
3. Maksym Naumenko (2024). Modern concepts of innovation management at enterprises. *Scientific innovations and advanced technologies* No. 6(34) (2024). DOI: [https://doi.org/10.52058/2786-5274-2024-6\(34\)-435-449](https://doi.org/10.52058/2786-5274-2024-6(34)-435-449).
4. Skitsko, V. (2009). Decision-making in conditions of uncertainty, conflict and the risk they entail. *Modeling and information systems in economics: Collection of scientific papers*. – K.: KNEU, 2009. – Vol. 79. – pp.52-61 [in Ukrainian].
5. Nevmerzhytska S. M. (2018). Formation of a strategy for the innovative development of enterprises in conditions of uncertainty. *Scientific Bulletin of the Kherson State University. Series: Economic Sciences*. 2018. Vol. 32. pp. 99-103. URL: <https://ej.journal.kspu.edu/index.php/ej/article/view/422/418>.
6. Krasnyuk M., Kulynych Yu., Hrashchenko I., Krasniuk S., Goncharenko S., Chernysh T. (2023). Innovative management information system in post-crisis economic conditions on emerging markets. *Moderní aspekty vědy – Modern aspects of science: svazek XXXVII mezinárodní kolektivní monografie*. Česká republika: Mezinárodní Ekonomický Institut s.r.o. pp. 185–203.

7. Krasnyuk, M., Kulynych, Y., Krasniuk, S., & Goncharenko, S. (2024). Design of innovative management information system. *Grail of Science*, 36, pp. 237-245.
8. Naumenko, M. (2024). Models of business knowledge in artificial intelligence systems for an effective competitive enterprise. *International scientific journal "Internauka". Series: "Economic Sciences"*. № 6. DOI: <https://doi.org/10.25313/2520-2294-2024-6-10010> [In Ukrainian].
9. Naumenko, M., & Hrashchenko, I. (2024). Modern artificial intelligence in anti-crisis management of competitive enterprises and companies. *Grail of Science*, (42), 120–137. DOI: <https://doi.org/10.36074/grail-of-science.02.08.2024.015> [In Ukrainian].
10. Лявинець Г. М., Губеня В. О., Люлька О. М., Ткачук Ю. М. (2024). Data Mining у адаптивному менеджменті готельно-ресторанного бізнесу. *Міжнародний науковий журнал "Інтернаука". Серія: "Економічні науки"*. – 2024. – № 11. <https://doi.org/10.25313/2520-2294-2024-11-10404>.
11. Maksym Naumenko (2024). Regression analysis using shallow artificial neural networks in the management of an efficient and competitive enterprise. *Věda a perspektivy*, 7(38) (2024), pp. 17-32. [https://doi.org/10.52058/2695-1592-2024-7\(38\)-17-32](https://doi.org/10.52058/2695-1592-2024-7(38)-17-32).
12. Tuhaienko V., Krasniuk S. Effective application of knowledge management in current crisis conditions. *International scientific journal "Grail of Science"*. 2022. № 16. pp. 348-358.
13. Hrashchenko I.S., Khmurova V. V. (2016). Innovative policy as a tool for organizational change. Economic development: theory, methodology, management. *Materials of the 4th International Scientific and Practical Conference*. Budapest-Prague-Kyiv, 28-30 November 2016. 386, p. 361-369. [In Ukrainian].
14. Tsalko T. R., Nevmerzhytska S.M. (2023) Risk assessment in innovative activity. *Actual problems in economics, finance and management: materials of the International Scientific and Practical Conference*. East European Center for Scientific Research (Odesa, 25 october 2023). Research Europe, 2023. pp. 92-94 <https://researcheurope.org/product/book-31> [in Ukrainian].
15. Naumenko, M. (2024). Methodology of determining factors of activity efficiency and competitive position of the enterprise on the market in crisis conditions. *Scientific innovations and advanced technologies*, № 7(35) (2024). DOI: [https://doi.org/10.52058/2786-5274-2024-7\(35\)-648-665](https://doi.org/10.52058/2786-5274-2024-7(35)-648-665) [in Ukrainian].
16. Nevmerzhytska, N. Buhas (2022). Opportunities, threats and risks of implementation the innovative business management technologies in the post-pandemic period COVID-19. *WSEAS Transactions on Business and Economics*. Volume 19. Pp. 1215–1229.
17. Krasnyuk, M. (2014). Hybridization of intelligent methods of business data analysis (anomaly detection mode) as a standard tool of corporate audit. *The state and prospects of the development Education and science of today: materials of the III International science and practice conf.* [m. Ternopil, October 10-11. 2014]. TNEU, 2014. pp. 211-212 [in Ukrainian].