

УДК 004.42

Stanislav Terletskyi¹, Yevhenii Hofman², Nataliia Zhukova³

¹ PhD student NU “Zaporizhzhia Polytechnic”

² PhD (Artificial Intelligence), Associate Professor NU “Zaporizhzhia Polytechnic”

³ PhD (Philology), Associate Professor NU “Zaporizhzhia Polytechnic”

STREAMLINING WORKFLOWS: AI-POWERED AUTOMATION OF ROUTINE TASKS

The problem of excessive working time on routine tasks is always relevant. One of the complex tools for automation is the use of artificial intelligence (AI) algorithms. According to the results of modeling and experimental verification, it was found that the implementation of such technologies allows to reduce data processing time and minimizes the influence of the human factor, which contributes to increasing the efficiency of management [1; 5; 7]. The results have practical significance for integrating automated systems into production and administrative processes.

The modern market demands high efficiency and effectiveness of business processes. Many routine operations, such as data entry, reporting, and monitoring of information flows, are traditionally performed manually, which leads to significant time consumption and an increased risk of errors [3]. Studies show that using AI technologies can significantly reduce task completion time and minimize the effects of the human factor [2]. In addition, the digital transformation of production processes contributes to implementing innovative solutions that can increase management efficiency [4].

Currently, much research focuses on individual aspects of workflow automation. Some studies consider the use of AI to automate data entry [1], while

others think of the possibilities of optimizing the workflow using machine learning [2; 5], although the problem of comprehensive integration of intelligent algorithms into control systems remains insufficiently studied, which requires the development of comprehensive models with an assessment of the implementation effect [3; 6].

As a result of the literature review, a generalized conceptual model for the implementation of AI in business processes is proposed:

1. Data collection and pre-processing: data from corporate information systems is used to collect parameters of routine operations (execution time, number of operations, errors);

2. Task classification: machine learning algorithms are used to distribute tasks by the level of automation; functions with the maximum impact of the human factor are determined [2];

3. Development of decision-making algorithms: adaptive neural networks optimize the workflow based on the received data [3];

4. Experimental verification: a series of tests in a controlled environment is conducted for a comparative analysis of task execution time before and after the implementation of AI. Standard statistical methods are used to verify the obtained results [6].

According to the experimental verification results, the automated system's implementation reduced the average time for performing routine tasks by approximately 35-40 %. For example, the average cycle of operations, which in the traditional approach was 100 seconds, is reduced to 60-65 seconds when the system is implemented. In addition, the number of errors associated with manual data entry is reduced by 25-30% [3]. The results are consistent with the model developed in section 3 and confirmed by previous studies [2; 5; 6].

The research results indicate that integrated automation systems optimize work processes and create economic benefits for organizations [3]. The proposed model allows us to assess the effect of implementing automation, confirming the possibility of scaling these systems in production and administrative processes [2]. Thus, an integrated approach that combines theoretical modeling with experimental verification is justified and promising for further developing adaptive control systems.

The results demonstrate the scientific and practical significance of the proposed methodology, which can be applied to optimize work processes in various industries. Further research should be aimed at developing adaptive algorithms in real time and integrating big data analysis modules for further improvement of management systems.

REFERENCES

1. Hlatshwayo M. The Integration of Artificial Intelligence (AI) Into Business Processes» [Electronic resource] / M. Hlatshwayo. – Access mode: https://www.researchgate.net/publication/375489528_The_Integration_of_Artificial_In

telligence_AI_Into_Business_Processes/ (accessed: 2025.03.25). – Title from the monitor.

2. Somers M. How Generative AI Can Boost Highly Skilled Workers' Productivity [Electronic resource] / M. Somers. – Access mode: <https://mitsloan.mit.edu/ideas-made-to-matter/how-generative-ai-can-boost-highly-skilled-workers-productivity/> (Accessed: 2025.03.25). – Title from the monitor.

3. Maniyka J. Automation and the Future of Work [Electronic resource] / J. Maniyka. – Access mode: <https://www.mckinsey.com/capabilities/mckinsey-digital/our-insights/automation-and-the-future-of-work/> (accessed: 2025.03.25). – Title from the monitor.

4. Ellingrud K. Generative AI and the Future of Work in America [Electronic resource] / K. Ellingrud, S. Sanghvi, G. S. Dandona, A. Magdavkar, M. Chui, O. White, P. Hasebe. – Access mode: <https://www.mckinsey.com/mgi/our-research/generative-ai-and-the-future-of-work-in-america/> (accessed: 2025.03.25). – Title from the monitor.

5. Khan A. H. AI-Powered Automation: Revolutionizing Industrial Processes and Enhancing Operational Efficiency [Electronic resource] / A. H. Khan, M. Lukas. – Access mode : https://www.researchgate.net/profile/Mia-Lucas-3/publication/386076266_AI-Powered_Automation_Revolutionizing_Industrial_Processes_and_Enhancing_Operational_Efficiency/links/6741f625b5bd9d17d6010dfe/AI-Powered-Automation-Revolutionizing-Industrial-Processes-and-Enhancing-Operational-Efficiency.pdf/ (accessed: 2025.03.25). – Title from the monitor.

6. Chinta S. The impact of AI-powered automation on agile project management transforming traditional practices [Electronic resource] / S. Chinta. – Access mode: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=5034076/ (accessed: 2025.03.25). – Title from the monitor.

7. Tyson L. D. Automation, AI & Work [Electronic resource] / L. D. Tyson, J. Zysman. – Access mode: <https://direct.mit.edu/daed/article/151/2/256/110620/Automation-AI-amp-Work/> (accessed: 2025.03. 20). – Title from the monitor.