

The Scope and Extent of the Use of Artificial Intelligence Tools in the Work of Statutory Auditors – An Empirical Analysis

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Introduction

The advancing digitisation of economic processes and the dynamic development of information technologies significantly impact the functioning of accounting and financial auditing. In recent years, solutions based on Artificial Intelligence (AI)¹ – including machine learning, big data analytics, and the automation of analytical and decision-making processes – have gained particular importance. These technologies are increasingly applied in financial auditing and reporting, supporting the analysis of data populations, anomaly detection, and audit risk assessment, leading to a gradual transformation of the traditional work model of the statutory auditor².

Discussions on the use of artificial intelligence in auditing also form part of a broader debate concerning the relationship between humans and technology, as well as the impact of AI on expert work and professions of public trust. As A. Przegalińska points out, artificial intelligence should not be perceived solely as a tool replacing humans, but as a system collaborating with human judgment and competencies,

¹ The term “artificial intelligence” was coined by John McCarthy in 1956 at the Dartmouth conference. Andreas Kaplan and Michael Haenlein define artificial intelligence as “a system’s ability to correctly interpret external data, to learn from such data, and to use those learnings to achieve specific goals and tasks through flexible adaptation”. Artificial intelligence has two primary meanings: hypothetical intelligence realised in a technical rather than natural process, and as the name of a technology and field of scientific research in computer science and cognitive science, drawing also on achievements in psychology, neurology, mathematics, and philosophy. Source: Margaret Ann Boden: “Sztuczna inteligencja” [Artificial Intelligence]. University of Łódź Publishing House, 2020, p. 30; Andreas Kaplan, Michael Haenlein, “Siri, Siri, in my hand: Who’s the fairest in the land? On the interpretations, illustrations, and implications of artificial intelligence”, *Business Horizont*, Elsevier, Vol. 62, Issue 1, January- February 2019, pp. 15-25.

² Appelbaum, D., Kogan, A., Vasarhelyi, M. A. “Big data and analytics in the modern audit engagement: Research needs”. *Auditing: A Journal of Practice & Theory*, 36(4), 2017, s. 2–5; Kokina, J., Davenport, T. H. “The emergence of artificial intelligence: How automation is changing auditing”, *Journal of Emerging Technologies in Accounting*, 14(1), 2017, pp. 116–118; D. Szostek, P. Kasprowski, J. Kozak, A. Kapczyński, R. Prabucki, “Wyzwania i zagrożenia z zakresu cyberbezpieczeństwa podczas projektowania lub wykorzystywania AI” [Challenges and threats in the field of cybersecurity when designing or using AI], *CyberPolicy* NASK 2023.

redefining the nature of cognitive and decision-making work³. It should be noted that a key challenge associated with AI development is the responsible design of human-algorithm relationships, where technology supports analytical processes but does not absolve humans of responsibility for decisions made⁴.

This perspective is of particular importance in the statutory auditor profession, where professional judgment, ethics, and professional responsibility constitute the foundation of the financial statement audit process. It is noteworthy that the use of AI tools significantly contributes to increasing audit efficiency and quality, as well as expanding the scope of analyses conducted by statutory auditors⁵. At the same time, risks associated with the limited transparency of algorithms, the potential for systemic errors, and the necessity of maintaining human oversight over key audit decisions must be emphasized⁶.

In the context of financial auditing, the application of artificial intelligence may lead not so much to the elimination of the statutory auditor's role, but rather to its transformation, that is, a shift from performing routine procedures towards interpreting analysis results, risk assessment, and the critical verification of recommendations generated by algorithms. The future of working with AI therefore requires the development of new competencies, including an understanding of the principles of algorithmic systems, their limitations, as well as potential cognitive biases⁷. This reflects the growing importance of information technologies in the audit process. However, their practical application remains constrained by organisational, financial, and competency barriers⁸.

The significance of the issue of using artificial intelligence in the work of statutory auditors stems not only from potential technological benefits but also from its impact on the future of the profession and the model of performing audit procedures. Questions arise regarding the scope of the statutory auditor's liability for results generated by algorithms, the compliance of the tools used with International Standards on Auditing, and the degree of preparedness of the professional environment to work with advanced analytical systems.

³ Przegalińska, A. *Istoty wirtualne. Jak fenomenologia zmieniała sztuczną inteligencję* [Virtual Beings. How Phenomenology Changed Artificial Intelligence], Universitas, Kraków 2016, pp. 243–246.

⁴ Kai-Fu Lee, *AI superpowers, hina, USA Silicon Valley, and the New World Order*, Polish translation: *Inteligencja sztuczna, rewolucja prawdziwa, Chiny, USA i przyszłość świata*, Media Rodzina, 2019, pp. 233–266.

⁵ Issa, H., Sun, T., Vasarhelyi, M. A. "Research ideas for artificial intelligence in auditing", *Journal of Emerging Technologies in Accounting*, 13(2), 2016, pp. 3–6; Sutton, S. G., Holt, M., Arnold, V., "Artificial intelligence research in accounting", *International Journal of Accounting Information Systems*, 2016, pp. 64–66.

⁶ Brynjolfsson, E., McAfee, A. *Machine, Platform, Crowd: Harnessing Our Digital Future*, New York: W.W. Norton & Company, 2017, pp. 89–94.

⁷ Roger Penrose, Emanuele Severino, Fabio Scardigli, Ines Testoni, Giuseppe Vitiello, Giacomo Mauro D'Ariano, Federico Faggin, *Artificial Intelligence Versus Natural Intelligence*, Springer, 2022, pp. 107-145.

⁸ S. Menon: How Can AI Drive Audits? ISACA, 2021, p.22, source: https://www.isaca.org/-/media/files/isacadp/project/isaca/articles/journal/2021/volume-4/how-can-ai-drive-audits_joa_eng_0721.pdf accessed on 15.12.2025.

The objective of this article is to assess the degree and scope of the utilisation of artificial intelligence tools in the work of statutory auditors in Poland, and to identify the perceived benefits and barriers associated with their application in audit practice. This objective is pursued through an empirical study conducted among statutory auditors. The article formulates the following research questions:

- 1) To what extent are artificial intelligence tools utilised in their own professional work?
- 2) At which stages of professional work do AI tools find the most frequent application?
- 3) What threats associated with the use of AI are most frequently identified?

The publication consists of three parts. Following the introduction, the theoretical aspects of using artificial intelligence in financial auditing are presented. Subsequently, the determinants and barriers to the application of AI in the work of statutory auditors are discussed. The next part contains a description of the empirical study methodology, followed by the presentation and discussion of its results. The article concludes with a presentation of the study findings, as well as conclusions and recommendations for audit practice and further research.

1. Artificial Intelligence in Financial Auditing

1.1 Concept and Classification of AI Tools Used in Auditing

The concept of artificial intelligence is defined multidimensionally, depending on the technological and functional context. It is most commonly accepted that Artificial Intelligence (AI) denotes a set of IT methods and tools enabling computer systems to perform tasks previously requiring human cognitive capabilities, such as learning, reasoning, pattern recognition, or data-driven decision-making⁹. In the context of financial auditing, AI does not constitute an autonomous decision-making entity but rather serves as a tool supporting the audit process through advanced data analytics and the automation of selected audit procedures¹⁰. AI tools used in auditing primarily include solutions based on machine learning, Big Data Audit Analytics, and data mining techniques¹¹. These technologies enable the analysis of full financial data populations instead of traditional sampling, which potentially increases the effectiveness of identifying irregularities and risks of material misstatement of the financial statements. AI tools used in auditing are most frequently classified according to their area of application. The basic categories include:

- 1) financial data analysis tools,
- 2) anomaly and fraud detection systems,
- 3) solutions for the automation of audit procedures¹².

Analytical tools utilizing machine learning algorithms enable the identification of unusual relationships, trends, and deviations in accounting data, supporting risk

⁹ Issa, H., Sun, T., Vasarhelyi, M. A., "Research ideas for artificial intelligence in auditing: The Formalization of Audit and Workforce Supplementation", *Journal of Emerging Technologies in Accounting*, 13(2), 2016, pp. 2–4; Margaret Ann Boden: "Sztuczna inteligencja" [Artificial Intelligence]. University of Łódź Publishing House, 2020, p. 30; Andreas Kaplan, Michael Haenlein, "Siri, Siri, in my hand: Who's the fairest in the land? On the interpretations, illustrations, and implications of artificial intelligence", *Business Horizons, Elsevier*, Vol. 62, Issue 1, January- February 2019, pp. 15-25.

¹⁰ A. Karmańska, „ Artificial Intelligence in Audit”, *Research Papers of Wrocław University of Economics and Business*, 2022, vol. 66, no. 4, pp. 87-88.

¹¹ D. Szostek, P. Kasprowski, J. Kozak, A. Kapczyński, R. Prabucki. *Wyzwania i zagrożenia z zakresu cyberbezpieczeństwa podczas projektowania lub wykorzystywania AI* [Challenges and threats in the field of cybersecurity when designing or using AI], CyberPolicy NASK 2023, pp. 22-33; Theophanis C. Stratopoulos, Victor Xiaoqi Wang, "Artificial intelligence and accounting research: a framework and agenda", *International Journal of Accounting Information Systems, Elsevier*, December 2025, Volume 56. source: <https://www.sciencedirect.com/science/article/pii/S1467089525000363> accessed on 12.12.2025.

¹² EY, "Audit innovation", source: https://www.ey.com/en_pl/services/audit/innovation accessed on 30.09.2025; Deloitte, *Cognitive technologies: The real opportunities for business*, 2015, source: <https://www.deloitte.com/us/en/insights/topics/emerging-technologies/cognitive-technologies-business-applications.html> accessed on 30.09.2025; Kokina J. and Davenport T.H., "The emergence of artificial intelligence: How automation is changing auditing", *Journal of Emerging Technologies in Accounting*, 14(1), 2017, 115-123, source: <https://doi.org/10.2308/jeta-51730>; Zang A. (Chanyuan), "Intelligent process automation in audit", *SSRN Electronic Journal*, 2019, source: <https://doi.org/10.2139/ssrn.3448091>.

assessment and audit planning¹³. Anomaly and fraud detection systems constitute one of the most developed forms of AI application in auditing. These algorithms learn typical transactional patterns and subsequently identify outliers that may indicate errors or fraudulent activities¹⁴. In turn, the automation of audit procedures includes, inter alia, tests of controls, data reconciliation, analysis of source documents, and the preliminary assessment of internal control. The use of AI tools in audit practice remains varied and still limited, focusing mainly on data analysis and the automation of repetitive tasks¹⁵.

1.2 The Role of Artificial Intelligence in the Financial Statement Audit Process

The application of artificial intelligence tools in financial auditing may cover a broader range of stages in the financial statement audit process. AI is used primarily at the stages of audit planning, risk assessment, performance of audit procedures, and, to a limited extent, at the stage of forming conclusions¹⁶.

At the audit planning stage, AI tools support the analysis of large sets of the client's financial and operational data, enabling the identification of areas with a higher risk of material misstatement. The use of machine learning algorithms allows for more precise data segmentation and earlier detection of unusual trends and relationships, which facilitates better targeting of further audit procedures¹⁷. It should be emphasised that analytical technologies enable auditors to move away from an approach based solely on experience and intuition in favour of analysing full data populations¹⁸.

¹³ Appelbaum, D., Kogan, A., Vasarhelyi, M. A. (2017), "Big Data and Analytics in the Modern Audit Engagement: Research Needs", *Auditing: A Journal of Practice & Theory*, Volume 36, Issue 4, 2017, pp. 1-27.

¹⁴ A. Wygodny, "Sztuczna inteligencja w audycie i zarządzaniu ryzykiem, nowe możliwości poszerzania wiedzy" [Artificial Intelligence in Audit and Risk Management: New Opportunities for Knowledge Expansion], *Kontrola i Audyt*, pp. 47-52, source: DOI: 10.53122/ISSN.0452-5027/2024.1.36.

¹⁵ M. Gajdziński, "AI w audycie to nowe możliwości. Przekładamy innowacje na korzyści dla klientów i pracowników" [AI in Audit Means New Possibilities. Translating Innovation into Benefits for Clients and Employees], source: <https://kpmg.com/pl/pl/wiedza/transformacja-biznesowa/ai-w-audycie-otwiera-nowe-mozliwosci-przekladamy-innowacje-na-realne-korzysci-dla-klientow.html> accessed on 10.12.2025.

¹⁶ Issa, H., Sun, T., Vasarhelyi, M. A., "Research ideas for artificial intelligence in auditing: The Formalization of Audit and Workforce Supplementation", *Journal of Emerging Technologies in Accounting*, 13(2), 2016, pp. 6-9; Appelbaum, D., Kogan, A., Vasarhelyi, M. A. (2017), "Big Data and Analytics in the Modern Audit Engagement: Research Needs", *Auditing: A Journal of Practice & Theory*, Volume 36, Issue 4, 2017, pp. 8-11.

¹⁷ M. Gajdziński, "AI w audycie to nowe możliwości. Przekładamy innowacje na korzyści dla klientów i pracowników" [AI in Audit Means New Possibilities. Translating Innovation into Benefits for Clients and Employees], source: <https://kpmg.com/pl/pl/wiedza/transformacja-biznesowa/ai-w-audycie-otwiera-nowe-mozliwosci-przekladamy-innowacje-na-realne-korzysci-dla-klientow.html> accessed on 10.12.2025; Deloitte [2019], AI leaders in financial services, <https://www2.deloitte.com/us/en/insights/industry/financial-services/artificial-intelligence-ai-financial-services-frontrunners.html> (accessed on: 13.12.2025); W. Goleński, M. Będziaszek, M. Fotla, "Duże zbiory danych, AI i otwarte źródła informacji" [Big Data, AI, and Open Information Sources], *Kontrola i Audyt*, pp. 149-154, source: DOI: 10.53122/ISSN.0452-5027/2025.1.10.

¹⁸ Mary Kay K. Copeland. "The Impact of Technology on the Audit Profession", *American Accounting Association*, Annual Conference, 2020, source: DOI:10.13140/RG.2.2.12368.12805; Julie Bell Lindsay, "Innovating to Meet Tomorrow's Challenges", source: https://www.theqaq.org/AuditEffect?gad_source=1&gad_campaignid=23446951426&gbraid=0AAAAACdl-LQ-uxGYwKVi2H2x0bvs8Tjdv&gclid=CjwKCAiAjojLBhAlEiwAc-jhrDgbaiyqydXXVZz_h80hbXMs0zphZ8fWfc05tVRLNZHRasODbAJqhhoCShYQAvD_BwE accessed on 10.12.2025.

The widest application of artificial intelligence is observed at the stage of performing audit procedures. AI tools are used for automatic transaction testing, reconciling accounting records, analysing source documents, and detecting anomalies that may indicate errors or fraud¹⁹.

It is noteworthy that the application of AI in audit procedures contributes to increased audit efficiency, measured by reduced audit completion time and a reduction in human effort required for repetitive tasks. In turn, the automation of data analysis enables auditors to focus on tasks requiring professional judgment, such as interpreting results, evaluating internal control, or communicating with the entity's management²⁰.

The impact of AI on audit quality is assessed from two perspectives. On the one hand, the analysis of full data populations and advanced anomaly detection techniques increase the likelihood of identifying material misstatements²¹. On the other hand, the risk of over-reliance on algorithm-generated results and the limited transparency of certain AI models may hinder the assessment of their compliance with auditing standards requirements.

Statutory auditors perceive artificial intelligence primarily as a supporting tool, rather than a replacement for the auditor's professional judgment. It is worth emphasising that the positive impact of technology on audit quality depends on user competencies and the degree of integration of AI tools with audit methodology. In this context, the role of artificial intelligence in the financial statement audit process consists not only of increasing operational efficiency but also of the gradual transformation of how audit work is performed²².

¹⁹ G. Wiśniewska, "Wpływ sztucznej inteligencji na pracę audytorów: czy biegły rewident może zostać zastąpiony przez sztuczną inteligencję?" [The Impact of Artificial Intelligence on Auditors' Work: Can the Statutory Auditor Be Replaced by Artificial Intelligence?], *Cracow University of Economics*, 2024, pp. 99-112.

²⁰ Appelbaum, D., Kogan, A., Vasarhelyi, M. A. (2017), "Big Data and Analytics in the Modern Audit Engagement: Research Needs", *Auditing: A Journal of Practice & Theory*, Volume 36, Issue 4, 2017, pp. 12-14; Kokina, J., & Davenport, T. H., "The Emergence of Artificial Intelligence: How Automation Is Changing Auditing", *Journal of Emerging Technologies in Accounting*, 14, 115-122, source: <https://doi.org/10.2308/jeta-51730> accessed on 15.12.2025.

²¹ Steve G. Sutton, Matthew Holt, Vicky Arnold, "The reports of my death are greatly exaggerated", *International Journal of Accounting Information Systems*, Elsevier, Volume 22, September 2016, pp. 60-73.

²² O. Frederik, "Digital Transformation in Auditing: Harnessing Technology for More Efficient and Effective Audits", *Journal of Business Practice, Economics, and Finance*, vol. 2, issue 1, 2024, p. 51.

2. Determinants of Artificial Intelligence Usage in the Work of Statutory Auditors

2.1 Factors Favouring AI Utilisation

The extent of artificial intelligence tool utilisation in financial auditing is determined by a range of individual and organisational factors. Key determinants favouring AI usage include the digital competencies of statutory auditors, the availability of appropriate technological tools, and organisational support from audit firms and the institutional environment²³. A positive attitude towards technology and basic knowledge of data analysis and algorithm functioning significantly increase auditors' propensity to use AI-based tools, whereas a lack of understanding of AI system mechanisms leads to mistrust of algorithm-generated results and limits their practical application²⁴. At the same time, it should be noted that digital competencies can be both a factor favouring AI usage and a barrier; insufficient digital preparedness limits the possibility of fully exploiting the potential of information technologies in auditing.

The second significant factor favouring AI usage is the availability of appropriate technological tools. Access to advanced analytical systems integrating financial and non-financial data and enabling the analysis of full data populations²⁵. However, these tools are more frequently implemented in large audit firms possessing appropriate financial and technological resources²⁶.

Another significant factor favouring AI usage is organisational support, including a digitisation strategy, training, and an organisational culture conducive to innovation. AI implementation in auditing is most effective in organisations that treat digital technologies as an element of long-term development, rather than merely a tool for cost optimisation²⁷.

²³ Issa, H., Sun, T., Vasarhelyi, M. A., "Research ideas for artificial intelligence in auditing: The Formalization of Audit and Workforce Supplementation", *Journal of Emerging Technologies in Accounting*, 13(2), 2016, pp. 10-12; O. Frederik, "Digital Transformation in Auditing: Harnessing Technology for More Efficient and Effective Audits", *Journal of Business Practice, Economics, and Finance*, vol. 2, issue 1, 2024, pp. 47-49.

²⁴ Eilifsen, A., Knechel, W. R., & Wallage, P., "Data analytics and auditing: Where are we and where should we be going?", *Auditing: A Journal of Practice & Theory*, 2020, 39(1), pp. 1-24; Ghobadian, A., Speller, S., & Jones, M., "Digital transformation and the future of work: A bibliometric analysis and research agenda", *Technological Forecasting and Social Change*, 2021, pp. 167, 120730.

²⁵ Appelbaum, D., Kogan, A., Vasarhelyi, M. A. (2017), "Big Data and Analytics in the Modern Audit Engagement: Research Needs", *Auditing: A Journal of Practice & Theory*, Volume 36, Issue 4, 2017, pp. 9-11.

²⁶ KPMG. (2020). *Embracing the digital transformation of audit*. Source: <https://advisory.kpmg.us/articles/2020/embracing-the-digital-transformation-of-audit.html> accessed on 09.10.2025.

²⁷ Issa, H., Sun, T., Vasarhelyi, M. A., "Research ideas for artificial intelligence in auditing: The Formalization of Audit and Workforce Supplementation", *Journal of Emerging Technologies in Accounting*, 13(2), 2016, pp. 11-13.

2.2 Barriers and Limitations

Despite the growing interest in the application of artificial intelligence in financial auditing, the scope of its practical utilisation remains limited. Key implementation barriers include high technology implementation costs, the risk of algorithmic errors, and ethical and regulatory issues related to the professional liability of statutory auditors. The costs of implementing AI tools encompass both capital expenditures associated with purchasing or developing advanced analytical systems, as well as the costs of training, integration with existing IT infrastructure, and system maintenance.

The second significant barrier, as mentioned in the previous part of the publication, involves risks associated with algorithmic errors and the limited transparency of AI models. Algorithms learning from historical data may replicate existing errors, biases, or inadequate patterns, which can lead to incorrect audit conclusions²⁸. It should be noted that the inability to fully explain the functioning of certain models, especially those based on deep learning, constitutes a challenge from the perspective of compliance with International Standards on Auditing²⁹. The risk of algorithmic errors is of particular importance in the context of the statutory auditor's professional liability. In accordance with applicable standards, the auditor bears responsibility for the audit conclusions, regardless of the degree of use of technological tools; consequently, the fear of over-reliance on algorithm-generated results limits auditors' propensity to apply AI in key audit areas.

Other barriers also concern ethical and regulatory issues. There is a lack of clear guidelines regarding the use of AI in financial auditing, particularly concerning algorithm transparency, data protection, and the documentation of procedures based on automated systems³⁰. Statutory auditors must pay attention to interpretive uncertainty regarding the compliance of using advanced analytical tools with national regulations and professional ethics standards. Ethical and regulatory barriers are particularly important in professions of public trust, where maintaining independence, objectivity, and professional judgment is of key significance. Consequently, the effective implementation of artificial intelligence in auditing requires not only technological development but also the adjustment of regulatory frameworks and the building of competencies enabling critical and responsible collaboration with algorithmic systems.

²⁸ Steve G. Sutton, Matthew Holt, Vicky Arnold, "The reports of my death are greatly exaggerated", *International Journal of Accounting Information Systems*, Elsevier, Volume 22, September 2016, pp. 71-73.

²⁹ Michelle Cardwell, Nadine Kater, Zaakirah Mohamed, and Bruce Vivian, "Embracing the AI Frontier: Rethinking Auditor Skills and Education", source: <https://www.ifac.org/knowledge-gateway/discussion/embracing-ai-frontier-rethinking-auditor-skills-and-education> accessed on 30.11.2025.

³⁰ Michelle Cardwell, Nadine Kater, Zaakirah Mohamed, and Bruce Vivian, "Embracing the AI Frontier: The Transformative Impact of AI on Audit Firms & Methodologies", IFAC, August 2025, source: <https://www.ifac.org/knowledge-gateway/discussion/embracing-ai-frontier-transformative-impact-ai-audit-firms-methodologies> accessed on 31.10.2025.

3. The Use of AI Tools by Statutory Auditors in Poland

Existing research covering the topic of artificial intelligence utilisation by statutory auditors has focused on describing the tools used during the performance of financial audit procedures, analysing their impact on the financial statement audit process, and analysing legal provisions and literature regarding isolated, anecdotal information on the scope of application of these tools by statutory auditors in Poland. The questionnaire survey for the purposes of this publication was conducted between 25 February 2025 and 31 May 2025. The obtained empirical material allowed for the collection of valuable information from respondents, including the degree of artificial intelligence utilisation in the work of statutory auditors and the impact of AI on work efficiency.

Aiming to limit the possibility of errors during the study while also increasing the validity of results, the research was designed in such a way that the obtained empirical data would allow for answering the research questions posed in this paper. In its first stage, entities having direct access to the respondents were identified³¹, which allowed for obtaining empirical data by maintaining the representativeness of key characteristics related to the research objectives in the sample and enabling the comparison of data obtained from respondents selected for the study. The sampling methods did not negatively affect the quality of the research or the utility of the collected empirical data, and the entire study was conducted in accordance with the ethical principles applicable to social research³². Participation was voluntary, and all responses were treated anonymously.

Active survey links were made available by the Regional Branch of the Polish Chamber of Statutory Auditors in Warsaw. The questionnaire was made available to respondents via the Internet (CAWI method). The person participating in the study filled out the survey independently³³, while the computer system responsible for handling the study verified the technical correctness of the provided answers and saved them for later analysis.

Given the time, financial, and organisational constraints, a sample-based study design was adopted, meaning that the observation covered respondents including a selected part of the statutory auditor population. The consequence of this decision was the necessity to determine the minimum sample size and select a method for representative sampling³⁴. In the case of the statutory auditor population, the population

³¹ E. Babbie, *The Practice of Social Research...*, op. cit., p. 165.

³² E. Babbie, *The Practice of Social Research...*, op. cit., pp. 79-94.

³³ M. Andralojć, "Zalety i ograniczenia ankiety internetowej jako metody zbierania materiały badawczego w dziedzinie ZZL" [Advantages and limitations of the internet survey as a method of collecting research material in the field of HRM], "Zarządzanie zasobami ludzkimi" Bimonthly, 2006, no. 5/2006, pp. 110-112.

³⁴ S. Nowak, *Metodologia badań Społecznych* [Methodology of Social Research], PWN Scientific Publishers, Warsaw 2012, pp. 298-303.

size was known and amounted to 4,854 individuals as of 31 December 2024³⁵; therefore, the minimum sample size was established at 67 completed questionnaires, assuming an estimated population proportion of 50%, a significance level of 10%, and a margin of error of 10%.

The responses to each survey question obtained from the respondents were collated and summarised using an Excel spreadsheet. Subsequently, using methods of descriptive and mathematical statistics, induction, and inference, an analysis of the obtained empirical material was performed, which allowed for finding answers to the research questions. To assess whether the relationships between the obtained results were not accidental, statistical significance (p) was applied³⁶. This signifies the risk of erroneously stating a relationship that does not actually exist. In this paper, a statistical significance level (p) of 5% was adopted as the acceptable probability of stating a relationship that does not actually occur³⁷.

At the beginning of each questionnaire, as required by the principles of research design, a request was placed to the respondent to complete it³⁸. The purpose of the study was presented therein, and the anonymity of the surveys was assured. The initial survey questions related to the socio-demographic characteristics of the respondents³⁹. Subsequently, questions directly addressing the research questions contained in this paper were included. Table 1 presents a summary of the number of persons who opened the survey link, as well as the number of completed and uncompleted surveys in the study.

Table 1. Summary of questionnaires used for analysis

Group Name	Minimum Sample Size	Number of Survey Link Visits	Number of Uncompleted Surveys	Number of Completed Surveys	Completion Rate
Statutory Auditors	74	213	139	74	34.7%

Source: authors' own elaboration based on survey data.

³⁵ 2024 Sprawozdanie z monitorowania rynku usług świadczonych przez biegłych rewidentów i firmy audytorskie oraz działalności komitetów audytu [2024 Report on the Monitoring of the Market for Services Provided by Statutory Auditors and Audit Firms and the Activities of Audit Committees], Polish Audit Supervision Agency (PANA), p. 14, source: <https://pana.gov.pl/wp-content/uploads/2025/05/sprawozdanie-z-monitorowania-ryнку-usług-swiadczonech-przez-biegłych-rewidentów-i-firmy-audytorskie-oraz-działalności-komitetów-audytu-za-2024-rok.pdf> accessed on 01.12.2025.

³⁶ J. Krasodomska, "Rachunkowość społeczna – perspektywa światowa i krajowa" [Social Accounting – Global and National Perspective], *Research Papers of Wrocław University of Economics*, no. 329, 2014, p. 191.

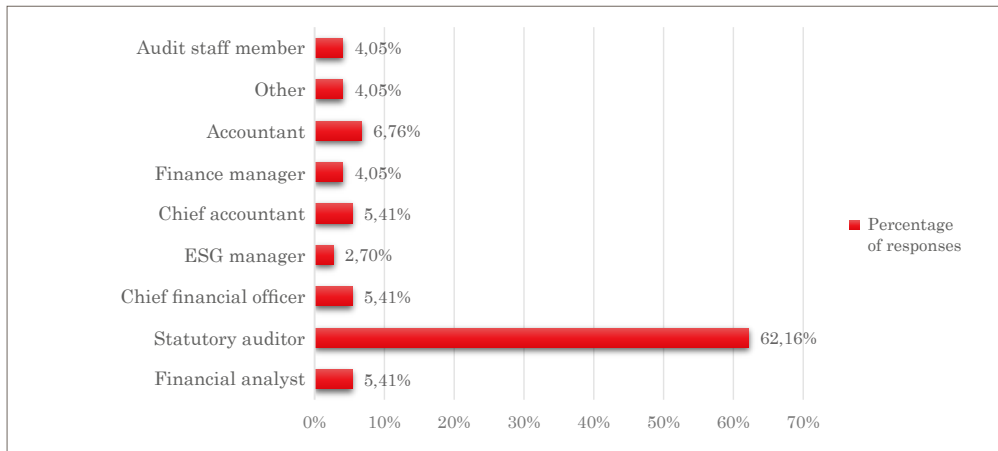
³⁷ B. Pułaska-Turyna, *Statystyka dla...* [Statistics for Economists], op. cit., pp. 242-243; M. Rószkiewicz, *Metody ilościowe w badaniach marketingowych* [Quantitative Methods in Marketing Research], PWN Scientific Publishers, 2012, pp. 290-300.

³⁸ J.W. Creswell, *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* [Polish transl.: Projektowanie badań naukowych. Metody jakościowe, ilościowe i mieszane], Jagiellonian University Press, Kraków 2009, p. 166; D.A. Dilmann, *Mail and telephone: the total design method*, New York John Wiley, 1978 r.

³⁹ E. Babbie, *The Practice of Social Research...*, op. cit., p. 277, p. 281.

Among the respondents, 82.4% were women and 17.6% were men. 90.5% of respondents declared that they are statutory auditors, while 9.5% stated that they are not statutory auditors. The collected information regarding the profession practiced by the study participants allowed for the verification of the possibilities of using AI tools in professional work, as presented in Figure 1.

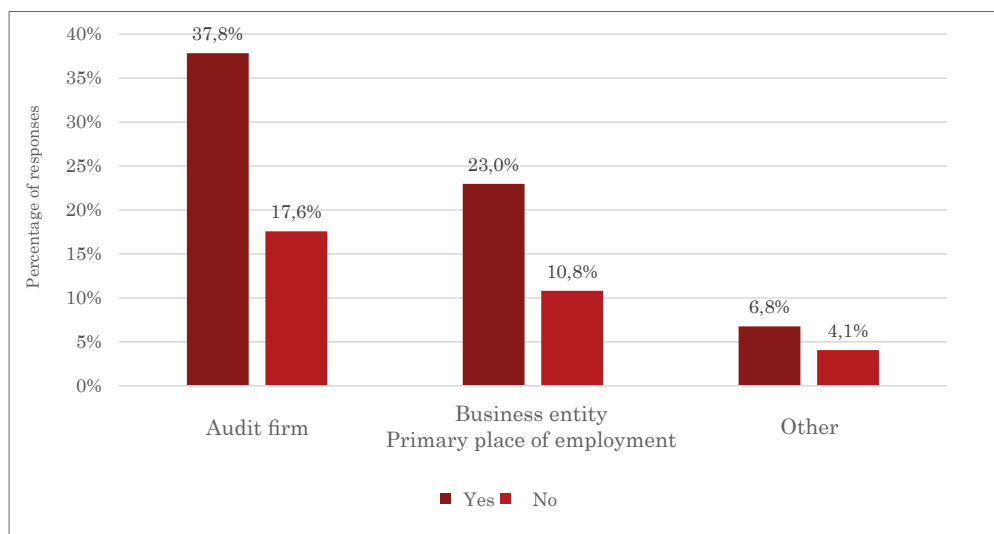
Chart 1. Profession practiced



Source: authors' own elaboration based on survey data.

The most numerous group of respondents consisted of individuals actively practicing the profession of statutory auditor (62.16%). Among other professions, the most frequent respondents were accountants (6.76%), followed by financial directors and financial analysts (5.41%). The chi-square goodness-of-fit test indicates a statistically significant variation in the distribution of respondents by profession ($\chi^2 = 196.00$; $df = 8$; $p < 0.001$). The distribution of professions deviates significantly from a uniform distribution, with a clear dominance of statutory auditors, who constituted over 60% of the sample.

Respondents were asked to provide information on whether they had ever used artificial intelligence tools in their work. The structure and distribution of responses regarding the use of artificial intelligence tools by the survey participants are illustrated in Figure 2.

Chart 2. Use of artificial intelligence tools

Source: authors' own elaboration based on survey data.

37.8% of respondents employed in audit firms declared using artificial intelligence tools at work, which may indicate greater engagement or access to the analysed solutions in this environment. A similar, though weaker, trend occurs among respondents employed in business entities, where study participants declaring the use of artificial intelligence tools constitute 23.0%, while non-users constitute 10.8%. The results of the chi-square test of independence did not demonstrate a statistically significant relationship between the respondents' main place of work and the answer provided ($\chi^2 = 0.106$; $df = 2$; $p = 0.949$). This means that the structure of "Yes" and "No" answers was similar regardless of the type of organisation in which the respondents performed their professional work. In order to obtain information on the respondents' familiarity with AI tools, the study participants were asked to self-assess their level of knowledge. The obtained information is presented in Table 2.

Table 2. Self-assessment of AI tool knowledge by respondents

Profession practiced	Very high (%)	High (%)	Medium (%)	Low (%)	No knowledge (%)
Financial Analyst	0.0	0.0	5.3	0.0	0.0
Statutory Auditor	4.1	8.1	14.8	28.4	6.8
Financial Director (CFO)	0.0	1.4	1.4	2.6	0.0
ESG Director	0.0	0.0	0.0	2.7	0.0
Chief Accountant	0.0	0.0	4.1	1.4	0.0
Other	0.0	2.7	1.3	4.1	0.0
Head of Finance Department	0.0	0.0	1.4	2.6	0.0
Accountant	0.0	0.0	4.1	2.7	0.0
Grand Total	4.1	12.2	32.4	44.5	6.8

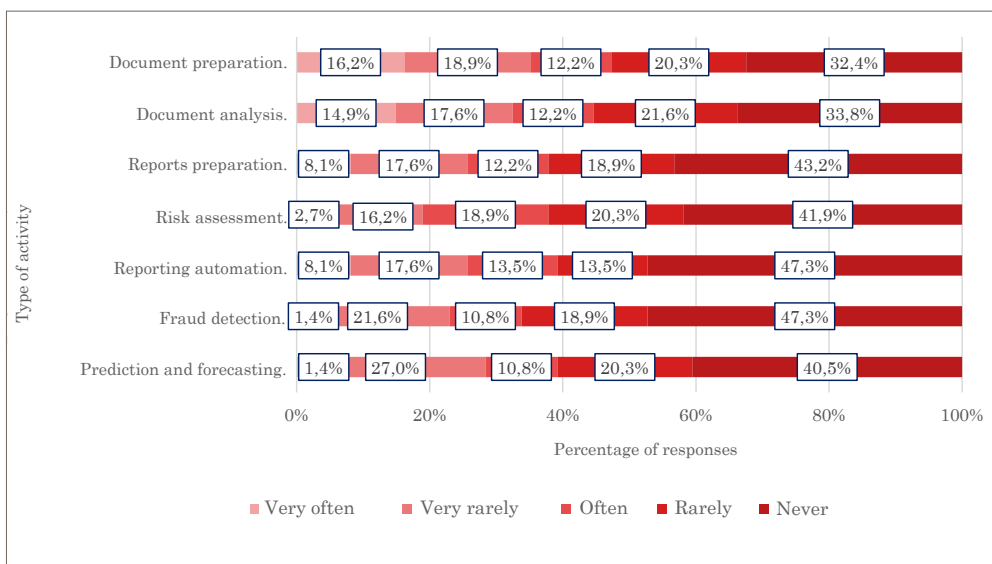
Source: authors' own elaboration based on survey data.

The data presented in Table 2 indicate that the declared level of knowledge of artificial intelligence tools among respondents is generally low. Low ratings (44.5%) and medium ratings (32.4%) dominate the entire sample, while only 16.3% of those surveyed declare a high or very high level of AI knowledge. At the same time, 6.8% of respondents indicate a total lack of knowledge of this type of tool. The greatest variation in responses is observed in the statutory auditor group, where all levels of competence self-assessment occur – from very high to no knowledge. Despite this, indications of low and medium levels of AI knowledge also prevail in this group. In the remaining professional groups, only medium and low ratings dominate, and the absence of declarations of very high competence may evidence the limited use of advanced AI tools outside the audit environment.

The chi-square test of independence revealed no statistically significant relationship between the profession practiced and the assessment of the level of knowledge of artificial intelligence tools ($\chi^2 = 25.02$; $df = 28$; $p = 0.627$). The results indicate that a low and medium level of declared AI competence is a common phenomenon regardless of the respondents' professional affiliation.

Respondents were asked to provide information on which activities and processes they use AI tools for. The structure and distribution of responses regarding the use of artificial intelligence tools by the survey participants are illustrated in Figure 3.

Chart 3. AI Utilisation in Work



Source: authors' own elaboration based on survey data.

The data indicate that the declared frequency of utilisation of the analysed solutions is generally low across all analysed areas. The highest percentage of “not at all” responses occurs in most of the analysed areas and varies from 32% to over 40%, which suggests that a significant portion of respondents does not apply the discussed solutions in their professional work at all. Responses indicating “very rarely” also remain at a relatively high level, i.e., from 16.2% to 27.0%, which may indicate that even if the tools are used, such use is incidental.

Responses “often” and “very often” appear much less frequently and are strongly differentiated between individual areas. The highest values in the “very often” category indicate that only a small group of respondents utilises the analysed solutions in a regular and systematic manner. This may evidence the existence of a narrow group of advanced users, alongside a lack of widespread technology adoption.

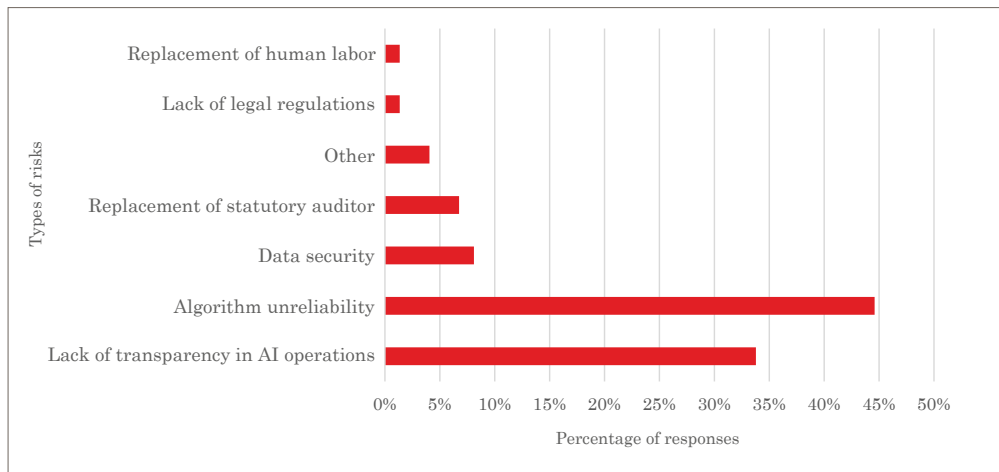
The results confirm that the utilisation of the analysed tools is at an early stage of development, and their application is selective and limited in nature. Such a response structure may result from competence, organisational, or technological barriers previously identified in the literature. Consequently, the observed low

frequencies of utilisation may constitute a significant limitation to fully leveraging the potential of modern solutions in audit practice.

Although “rarely” and “not at all” responses dominate in general terms, the chi-square test results indicate that the intensity of using the analysed solutions is significantly differentiated between the studied areas. In some areas, a relatively higher share of “often” and “very often” responses is observed, while in others, there is an almost total absence of regular utilisation. The results confirm that the use of the analysed tools is not homogeneous and is selective in nature, which may reflect functional differences between areas of audit work and a varied level of technological maturity.

In order to obtain information on the greatest risks resulting from the use of artificial intelligence tools, respondents were asked to indicate what they believe to be the greatest threats. The structure and distribution of responses regarding the use of artificial intelligence tools by the survey participants are illustrated in Figure 4.

Chart 4. Risks arising from the use of AI



Source: authors' own elaboration based on survey data.

The greatest concerns related to the use of artificial intelligence in professional work focus primarily on the technical and cognitive aspects of AI system functioning. The most frequently indicated concern is the fallibility of algorithms, declared by 44.6% of respondents. This result suggests that users fear errors generated by AI systems and their potential impact on the quality of decisions made, which is of particular significance in professions requiring a high level of professional judgment and responsibility.

Almost 34% of those surveyed pointed to the lack of transparency in AI operations. This concern relates to the limited ability to understand the decision-making mechanisms of algorithms, which may hinder their verification, the documentation of procedures, and the justification of professional conclusions. In the context of statutory auditors' work, the lack of algorithm transparency constitutes a significant challenge from the perspective of compliance with applicable auditing standards.

Only slightly over 8% of the study participants have concerns related to data security when using AI tools, which may suggest that respondents perceive technological risks more through the prism of the quality and reliability of results than cybersecurity threats. Concerns regarding the replacement of statutory auditors' work by artificial intelligence were indicated by only 6.8% of those surveyed, which may indicate that the fear of total automation of the profession is not a dominant problem in the sample. The chi-square test reveals a statistically significant difference in the frequency of responses concerning individual risks related to the use of artificial intelligence at work ($\chi^2 = 94.95$; $df = 6$; $p < 0.001$), which confirms that respondents attribute significance to selected risk categories.

4. Conclusions and Recommendations

4.1 Key Findings from the Study

The empirical study assessed the extent to which statutory auditors utilise artificial intelligence tools in their professional work. The results indicate that despite the growing availability of AI-based solutions, the level of their practical utilisation in financial auditing remains relatively low and varied. The dominant form of respondents' contact with AI tools is sporadic or incidental use. In the majority of analysed areas, "rarely" and "not at all" responses prevailed, which may suggest that artificial intelligence does not yet constitute an integral element of financial statement audit methodology. At the same time, only a small group of respondents declared frequent or very frequent use of the analysed tools, which may evidence the existence of a narrow group of advanced users.

The study results indicate that the declared level of knowledge of AI tools is generally low or medium, regardless of the profession practiced. The lack of statistically significant relationships between the profession and the self-assessment of AI competence suggests that insufficient preparation for working with advanced tools is common in the professional environment related to accounting and auditing. Simultaneously, the greatest variation in responses was observed in the statutory auditor group, indicating an uneven level of new technology adaptation within the same profession.

Based on the obtained results, it can also be concluded that the respondents' level of preparation for working with artificial intelligence tools remains insufficient in the context of the advancing digitalisation of financial auditing; this may constitute a barrier to the wider use of these technologies in practice and limit the scope of practical utilisation of the analysed tools.

A significant conclusion drawn from the study provides confirmation of these trends. The results indicate that key challenges related to the use of AI in professional work focus on trust in algorithms and their transparency, rather than on a direct threat to employment, thereby confirming that the digital transformation of audit is gradual and selective in nature.

4.2 Recommendations for Statutory Auditors and Audit Firms

The study findings support the following practical recommendations. Of key significance is the systematic development of statutory auditors' digital competencies, covering not only the operation of specific tools but also an understanding of the principles of algorithm functioning, their limitations, and the risks associated with their application. These competencies should become an integral and key element of continuing professional education.

Audit firms should treat the implementation of AI tools as an element of a long-term development strategy, not merely as a tool for increasing operational efficiency. This includes both investments in appropriate technological infrastructure and the creation of procedures ensuring the compliance of AI utilisation with applicable auditing standards and principles of professional ethics. A significant role should be played by professional and supervisory institutions, which, through guidelines, recommendations, and educational activities, can support the safe and responsible use of artificial intelligence in auditing. Clear regulatory frameworks may limit interpretive uncertainty and increase auditors' trust in new technologies.

4.3 Directions for Future Research

The presented results indicate the need for continued research on the utilisation of artificial intelligence in financial auditing and reporting. In particular, it seems justified to conduct in-depth qualitative studies allowing for a better understanding of statutory auditors' attitudes towards AI and the mechanisms of decision-making regarding its practical application.

Another direction of research could be comparative analyses covering different countries or segments of the audit market, which would allow for the identification of institutional factors influencing the pace of AI adoption. It is also worth considering studies enabling the assessment of changes in the level of AI tool utilisation over time, or exploring the impact of artificial intelligence utilisation on audit quality, including the statutory auditor's professional judgment and the relationship between technology and professional liability. These studies may constitute a basis for the further development of standards and best practices in the field of the digital transformation of financial auditing.

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