

DOI 10.36074/logos-05.09.2025.026

NEXT-GENERATION INTELLIGENT AUDIT: INNOVATIVE TRANSFORMATION AND STRATEGIC EVOLUTION OF FINANCIAL CONTROL THROUGH AI, XAI, AND AUTONOMOUS DIGITAL PLATFORMS

Serhii Popel¹

1. Founder of the IT company Smart, founder of the startup Alditor
UKRAINE

Abstract. *This study offers an in-depth analysis of the next-generation intelligent audit concept—a financial control system that integrates artificial intelligence (AI), autonomous digital platforms, Explainable AI (XAI), and large language models (LLM). An innovative approach to implementing Audit-as-a-Service (AaaS), specifically tailored to the needs of small and medium-sized enterprises (SMEs), is described. The focus is placed on platform architecture, AI model transparency, personalized analytics, as well as automation of compliance processes and enhancing the strategic value of managerial decision-making.*

Introduction: Digital Transformation in Auditing

The global economy today is undergoing a large-scale digital transformation, fundamentally changing the ways in which financial information is processed, verified, and interpreted. Traditional auditing methods, based primarily on selective data analysis, are increasingly losing their effectiveness in a world of exponentially growing data volumes and complex regulatory environments.

Classical approaches no longer meet modern needs, as they cannot respond promptly to the dynamics of business processes or provide forecasts of potential risks. This has led to rising demand for tools that can transform auditing from a traditional retrospective operation into proactive, continuous financial monitoring [2,5].

Next-generation intelligent audit is a direct response to these challenges. It creates an environment where AI, autonomous platforms, XAI, and large language models work in tandem to provide transparent, adaptive, and highly efficient business data analysis. This approach is especially relevant for SMEs, where traditional auditing services are often too costly or difficult to implement [3,7].

SECTION 14.

INFORMATION TECHNOLOGIES AND SYSTEMS

This article aims to reveal the theoretical foundations and practical capabilities of next-generation intelligent audit, present architectural solutions for the platform, and outline future development directions in the field [1–4].

Foundations of Intelligent Audit

Intelligent audit is a comprehensive approach to processing accounting and financial data based on the synergy of several modern technologies:

Explainable AI (XAI) — systems capable of providing clear, understandable explanations of their analytical conclusions, increasing user trust;

Machine learning and deep learning models — for automated detection of atypical patterns, trends, and potential threats;

Autonomous agents — constant, automated monitoring of key financial indicators;

Large language models (LLM) — enabling intuitive interaction between users and the system in natural language;

API interfaces — for seamless integration with corporate systems such as ERP, CRM, POS, etc.

This integrated approach changes the very nature of auditing—from one-off analysis to continuous, dynamic decision support [2,6].

Audit-as-a-Service (AaaS) as an SME Support Tool

For many SMEs, auditing is a necessity, but high costs and the complexity of routine procedures make it less accessible. The AaaS model offers an innovative solution, turning auditing into a flexible, scalable service that operates on a “pay-as-you-go” basis.

Main advantages of AaaS for SMEs:

- Reduced audit costs;
- Instant online analysis;
- Minimization of human errors through automation;
- Automatic compliance with regulatory requirements;
- Ability to receive personalized recommendations without involving external consultants [3,5].

Architectural Features of the Intelligent Auditor

Intelligent audit systems are implemented as multi-layered modular platforms:

Data integration layer — collects and unifies information from ERP, CRM, banking APIs, and document management systems;

ETL modules — clean, normalize, and transform data for further processing;

Analytical core — includes machine learning algorithms for anomaly detection, forecasting, and clustering, as well as compliance modules for accounting standards;

Explainable AI (XAI) module — ensures transparency and interpretability of analytical conclusions through informative reports;

User interfaces — built on LLMs to simplify communication with the system;

Self-learning mechanisms — improve analytical accuracy based on historical data and business feedback [7–9].

This approach ensures scalability, adaptability, and high efficiency [6,10].

Compliance Automation

A dedicated system component is responsible for monitoring compliance with legislative, tax, and industry standards. The module updates automatically in response to changes in the regulatory landscape, not only detecting violations but also explaining causes and suggesting specific corrective actions [2,5].

Transparency Through Explainable AI (XAI)

One of the key factors in successfully implementing AI in auditing is eliminating the “black box” in decision-making. XAI technologies allow for:

- Increasing business trust through understandable explanations;
- Justifying audit conclusions to regulators;
- Using SHAP and LIME methods to analyze factor influence in detail;
- Presenting results in text, tabular, and visual formats;
- Personalizing models to meet industry and corporate needs [9,11].

Role of Large Language Models (LLM) in User Interaction

LLMs, such as GPT, act as “translators” of complex analytical conclusions into user-friendly formats, providing:

- Natural language interaction;
- Automatic creation of financial summaries and explanations;
- Answers to common queries, such as causes of errors;
- Risk forecasts in an understandable form [8].

Scaling and Personalization of Analytics

Intelligent audit models are trained with consideration of a company's industry, seasonality, revenue and expense structure, and accounting style. This significantly improves recommendation quality and forecast accuracy [3].

The use of cloud services supports updates and personalization for thousands of clients simultaneously, optimizing costs and improving system flexibility [6,10].

Practical Benefits

Next-generation intelligent audit:

- Minimizes human factor influence and reduces fraud risks;
- Detects violations in real time;
- Integrates accounting, management, and analytics into a unified ecosystem;

SECTION 14.

INFORMATION TECHNOLOGIES AND SYSTEMS

- Enhances transparency and trust, even in small companies;
- Saves time and resources, focusing experts on strategic priorities [1,4].

Ethical Considerations and Future Research

The use of autonomous AI systems in auditing raises several challenges:

- Ensuring confidentiality and protection of financial and personal data;
- Defining responsibility for machine-made decisions;
- Necessity for transparent, auditable algorithms;
- Aligning system operations with national and international standards;
- Implementing certification for digital auditors [7,9].

Future research should focus on improving model interpretability, developing personalized methodologies, and forming a regulatory framework for AI in auditing.

Conclusion

Next-generation intelligent audit is a comprehensive strategic solution that meets modern business demands for transparency, accessibility, and reliability in financial control. The combination of AI, XAI, autonomous agents, and LLMs opens the door to proactive, adaptive, and understandable auditing.

Modern intelligent platforms create favorable conditions for the large-scale adoption of intelligent auditing across businesses of all sizes, particularly SMEs, helping reduce risks and improve the efficiency of managerial processes [1–11].

REFERENCES:

- [1] Omush, A. (2025). *Artificial intelligence in financial auditing: Redefining accuracy and transparency in assurance service*. *EDPACS*, 70(6). <https://doi.org/10.1080/07366981.2025.2459490>
- [2] INTOSAI Journal. (2024). *The use of artificial intelligence (AI) in the execution of audits*. <https://intosaijournal.org/journal-entry/the-use-of-artificial-intelligence-ai-in-the-execution-of-audits/>
- [3] IJNRD. (2024). *AI-based financial auditing system: An analytical approach*. <https://www.ijnrd.org/papers/IJNRDTH00148.pdf>
- [4] IJSRED. (2025). *A study on the impact of artificial intelligence in financial audits*. *International Journal of Scientific Research and Engineering Development*, 8(2). <https://www.ijared.com/volume8/issue2/IJSRED-V8I2P198.pdf>
- [5] Rahman, A. (2025). *The role of artificial intelligence in modern finance: Current applications and future prospects*. ResearchGate. https://www.researchgate.net/publication/387453472_The_Role_of_Artificial_Intelligence_in_Modern_Finance_Current_Applications_and_Future_Prospets
- [6] WJARR. (2024). *AI in auditing: A future-oriented perspective*. *World Journal of Advanced Research and Reviews*, 22(1). <https://wjarr.com/sites/default/files/WJARR-2024-0460.pdf>
- [7] Universität Graz. (n.d.). *Artificial intelligence in auditing systems* [Master's thesis, Universität Graz]. <https://unipub.uni-graz.at/obvugrds/download/pdf/10133676>

- [8] Issa, H., & Kogan, A. (2023). Artificial intelligence (AI) and the accounting function. *Journal of Emerging Technologies in Accounting*, 17(1), 99–113. <https://publications.aaahq.org/jeta/article-abstract/17/1/99/9313/Artificial-Intelligence-AI-and-the-Accounting?redirectedFrom=fulltext>
- [9] Kokina, J., Pachamanova, D., & Corbett, A. (2025). A framework for evaluating the explainability of artificial intelligence models in accounting and auditing. *Journal of Accounting and Public Policy*. <https://www.sciencedirect.com/science/article/pii/S1467089525000107>
- [10] Thomson Reuters. (2024). *Navigating the new era of auditing with AI technology: Meet audit intelligence analyze*. <https://tax.thomsonreuters.com/blog/navigating-the-new-era-of-auditing-with-ai-technology-meet-audit-intelligence-analyze/>
- [11] Wolters Kluwer. (2024). *Artificial intelligence & auditing: Enhancing the audit lifecycle*. <https://www.wolterskluwer.com/en/expert-insights/artificial-intelligence-auditing-enhancing-audit-lifecycle>

