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AUTOMATION OF ACCOUNTING USING ARTIFICIAL INTELLIGENCE: THE PROSPECTS FOR 'ROBOTISED' ACCOUNTANTS

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ABSTRACT. Historically, the banking sector has been an environment in which automation delivers the greatest returns: transaction volumes are enormous, regulatory requirements are numerous, and the cost of error—both reputational and financial—is high. The question facing bank accountants today is not 'can AI do their job', but 'which part of it has it already taken over'. This article explores the mechanisms for implementing artificial intelligence tools into the accounting systems of commercial banks: from robotic process automation (RPA) to machine learning for fraud detection and risk forecasting. It examines the prospects for the development of the so-called 'robotic accountant' — an integrated AI agent capable of recording transactions in real time with minimal human intervention. Particular attention is paid to the context of the Republic of Uzbekistan, where banking digitalisation is combined with active state regulatory initiatives in the field of artificial intelligence. A fundamental conclusion is drawn: the complete replacement of an accounting specialist in a bank is impossible without rethinking the very nature of the profession, and not just its tools.

Keywords: artificial intelligence, banking accounting, robotic process automation, RPA, machine learning, digitalisation, banking sector, Uzbekistan, financial reporting, risk management.

INTRODUCTION. In recent years, the automation of accounting in the banking sector has evolved from a purely technical task into a key element of large-scale digital modernisation. The need to process large volumes of data, strict compliance with regulatory requirements and the high risk of financial errors make the integration of artificial intelligence technologies into accounting systems a logical step. At the present stage, certain functions, including document processing and the detection of anomalies in transactions, have already been partially delegated to algorithmic systems.

Against this backdrop, there is increasing discussion of the concept of a 'robotic accountant' – a system capable of automatically generating accounting entries and processing data with minimal human involvement. However, this is not so much about completely replacing the specialist as it is about redefining their role: shifting from performing routine tasks to monitoring, analysing and interpreting information.

For the Republic of Uzbekistan, this topic is of particular relevance, as the banking sector is simultaneously undergoing a phase of active digitalisation and the implementation of artificial intelligence technologies. This opens up new opportunities for improving the efficiency of

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accounting, whilst also giving rise to a number of constraints related to the level of technological readiness and the regulatory framework.

LITERATURE REVIEW. Academic interest in the application of artificial intelligence in accounting is not new; however, its banking dimension has long remained in the shadow of general research into financial automation. A turning point can be considered the work of Kokina and Davenport (Kokina & Davenport, 2017), who proposed the first systematic classification of cognitive technologies as applied to auditing and accounting, identifying four levels of intelligence — ranging from the analysis of numerical data to the physical execution of tasks. The authors noted that none of the major players in the audit sector had, at that time, reached the level of 'self-aware' artificial intelligence; however, all four functions were already being partially performed by software systems. This observation remains relevant today , as it outlines the 'ceiling' of automation, which banking accounting is only just approaching.

Lehner and his co-authors (Lehner, Ittonen, Silvola, Ström & Wührleitner, 2022) continued the discussion on the limits of automation, focusing on the ethical aspects of AI-based solutions in accounting and auditing. Using Rest's four-component model, the authors demonstrated that delegating decisions to an algorithm disrupts established chains of moral responsibility: who bears responsibility for a system error—the model developer, the bank manager, or the algorithm itself? This issue is particularly acute in the context of banking accounting, where an automatically generated transaction could result in regulatory sanctions.

In parallel, the researchers examined specific automation tools. Afrin and co-authors (Afrin et al., 2024), in a review published in the journal IEEE Access, analysed the evolution of robotic process automation (RPA) from 'dumb' rule-based automation to intelligent agents capable of processing unstructured documents. In the banking sector, this means that modern RPA bots are capable not only of processing standard payment orders, but also of classifying incoming SWIFT messages, recognising scanned source documents and generating accounting entries without operator intervention. According to data from Grand View Research, by 2030 the global RPA market in the banking and financial sector is expected to reach a value of US$8.79 billion, with a compound annual growth rate of 39.4%, which contradicts conservative views of such software tools as merely auxiliary.

Moll and Yigitbasioglu (2019) viewed internet technologies as a catalyst for the restructuring of accounting functions, forecasting a shift from the role of the accountant-executor to that of the accountant-analyst. This forecast is being realised in the banking sector at a marked pace: the automation of routine operations, such as interest accrual and the reconciliation of interbank positions, allows specialists to focus on handling exceptions and interpreting data.

Han and his co-authors (Han, Shiwakoti, Jarvis, Mordi & Botchie, 2023) highlighted the synergistic effect of these two technologies in a systematic review of the literature on the application of blockchain and artificial intelligence in accounting: artificial intelligence provides analytical data processing, whilst blockchain ensures data immutability and transparency. In the banking sector, this combination of technologies is particularly in demand for the analytical accounting of interbank transactions and derivative financial instruments.

Finally, Mirzaie's (2025) study systematised the opportunities and risks of AI in accounting: a reduction in manual labour, improved reporting accuracy, and continuous auditing — alongside increased costs for system implementation, the risk of job losses, and issues regarding the transparency of algorithmic decisions. It is precisely this last aspect that raises the greatest doubts for the author: an algorithm making decisions in banking accounting must be explainable (Explainable AI), otherwise the regulator will be unable to verify it or accept its output as reliable.

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MAIN SECTION. Accounting in banking institutions differs fundamentally from accounting in non-financial organisations due to a number of structural features, each of which either facilitates or complicates the automation process. Firstly, the scale of operations: a large commercial bank processes tens of thousands of transactions daily, each of which requires a correct accounting entry in accordance with the chart of accounts approved by the regulator. In Uzbekistan, this chart of accounts is approved by the Central Bank and provides for specialised accounts for recording lending operations, funds raised, as well as the bank's income and expenses. With such a volume of transactions, manual posting inevitably leads to errors and delays — it is precisely in this situation that RPA bots demonstrate the most measurable impact.

Secondly, the regulatory burden: banks are required to prepare reports for the Central Bank, tax authorities, and in accordance with international standards (IFRS). Each reporting form represents an aggregation of thousands of records, requiring data consistency across the entire accounting system. Generative AI models, integrated with the banking system's automated banking system (ABS), are capable of generating drafts of regulatory forms in a matter of hours rather than days, leaving the specialist to verify and sign them.

Thirdly, the risk of fraudulent activity. In banking reporting, an anomalous transaction is viewed not as a simple error, but as a potential sign of financial crime. Neural network models, in particular the LSTM architecture for analysing transaction time series, enable the identification of patterns that are not detected by the trigger rules of traditional anti-money laundering (AML) systems. According to Decree No. PP-358 of the President of the Republic of Uzbekistan dated 14 October 2024 'On the Approval of the Strategy for the Development of Artificial Intelligence Technologies until 2030', the preventive detection of fraud is defined as a priority area for the application of artificial intelligence in the banking and financial sector.

The term 'robotic accountant' emerged in professional discussions around 2018–2019 and was initially met with scepticism. Currently, the focus is on specific architectural solutions: an AI agent connected to an automated banking system (ABS) accesses raw transaction data, applies accounting policy rules, generates double-entry records and saves them to the accounting system — all of this takes place without human intervention at the level of individual transactions. Human intervention is required only in exceptional cases requiring professional judgement.

Technically, such an agent consists of three layers: the first is recognition (OCR, natural language processing for incoming documents); the second is classification and decision-making (machine learning); and the third is execution (RPA, which posts entries to the ABS). Mature implementations of this architecture, such as Oracle Fusion Accounting Hub with artificial intelligence elements or SAP S/4HANA Finance, are already being used by major banks in Western Europe and South-East Asia. For Uzbekistan, this level of maturity remains a prospect: according to open sources, in 2023 most of the country's banks completed the consolidation of banking codes and the basic digitisation of customer databases, and in 2024 the implementation of BPM and CRM platforms began , laying the groundwork for the next stage of development.

This raises a significant contradiction. The 'Digital Uzbekistan – 2030' strategy, approved by Presidential Decree No. UP-6079 of 5 October 2020, sets ambitious goals for the digital transformation of public and private institutions. At the same time, the digital infrastructure of banks is still in its infancy. An attempt to rapidly implement a fully-fledged AI accountant in conditions where data has not yet been standardised will inevitably lead to failure. Digitalisation does not tolerate haste, although political will often demands precisely that.

Below is the author's classification of a bank's main accounting operations, with an assessment of the applicability of artificial intelligence tools within the context of Uzbekistan's banking sector. The degree of applicability was assessed according to three criteria: the maturity

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of the regulatory framework, the technological readiness of banks, and the existence of implementation precedents.

Type of accounting transaction	**Traditional method**	**AI/RPA tool**	**Expected effect**	**Applicability in Uzbek banks**
Processing and posting of payment orders	Manual entry, controller	RPA bot (UiPath, Blue Prism)	Time reduction of 70–90%; errors — close to zero	High (being implemented)
Control of interbank settlements	Manual reconciliation of statements	ML algorithms for automatic reconciliation	Real time; discrepancies identified instantly	Medium (pilot phase)
Accrual of interest on deposits and loans	Excel / ABS with manual verification	AI agent with access to ABS	Elimination of arithmetic errors; saving 40–60 man-hours per month	High
Detection of suspicious transactions (AML)	Trigger rules + staff	Neural network models (XGBoost, LSTM)	30–50% increase in detection accuracy compared to rules	Medium (Central Bank of Uzbekistan — regulatory framework)
Preparation of regulatory reporting (Central Bank forms)	Manual collection, verification by an auditor	Generative AI + RPA	Reduction in preparation time from 3– 5 days to a few hours	Low (prospective)
Archiving of source documents	Paper / manual electronic archive	OCR + AI-based classifier	100% full-text search; reduction in physical costs	High

Table 1. Applicability of AI and RPA tools in commercial banks' accounting operations (using the Republic of Uzbekistan as an example)

As shown in Table 1, the most suitable operations for immediate implementation remain those that are technologically simple yet labour-intensive: processing payment orders, calculating interest and archiving documents. It is with these that one should begin — not because they are the most important, but because a rapid demonstration of results builds institutional trust in the technology. The implementation of artificial intelligence for anti-money laundering (AML) tasks and the preparation of regulatory reports requires prior approval from the Central Bank of Uzbekistan, which shifts the issue from the technological sphere to the regulatory and legal sphere.

The Republic of Uzbekistan's state policy on artificial intelligence is taking shape with increasing intensity. Presidential Decree No. PP-4996 of 17 February 2021 'On measures to create conditions for the accelerated implementation of artificial intelligence technologies' established organisational mechanisms to support the sector. The Artificial Intelligence

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Development Strategy up to 2030, adopted in October 2024, set quantitative targets: a market volume for artificial intelligence products of up to US$1.5 billion, as well as inclusion in the top 50 of the government artificial intelligence readiness index. An interest-free loan of US$50 million to the Restructuring Fund is provided for financing.

The next point in the Strategy is of fundamental importance to the banking sector: the priority tasks for the application of artificial intelligence in the banking and financial sector identified are fraud prevention, creditworthiness assessment and market trend forecasting. It is noteworthy that the automation of accounting as such is not explicitly mentioned in this list — it is implied through 'improving operational efficiency', but is not singled out as a separate area. This discrepancy between the strategic document and the actual needs of banks in the field of accounting, in the author's view, represents a gap that must be addressed at the level of the Bank of Russia's industry standards.

According to Mastercard data published in the study 'Generative AI: The transformation of banking' (2023), in the same year 55% of executives at major global companies were already conducting assessments or experiments with artificial intelligence, whilst 37% were actively implementing it in their operations. The existing gap between global trends and the current state of Uzbekistan's banking sector is significant, though not critical. Starting the process later offers a certain advantage: the opportunity to avoid the mistakes typical of early adopters and to immediately implement mature, proven solutions.

The notion that artificial intelligence will replace accountants suffers from the same oversimplification as the claim that the calculator has replaced mathematicians. The automation of routine operations, such as posting, reconciliation and accruals, does not eliminate the need for professional judgement when formulating accounting policies, interpreting non-standard transactions, assessing the fair value of financial instruments, and interacting with auditors and regulators. All this requires not only knowledge of the rules, but also an understanding of their nature — something that an algorithm without explainability cannot provide.

The most realistic model of a robotic accountant does not involve replacing the specialist, but rather a fundamental restructuring of their working hours: a shift from a predominance of routine tasks (80%) and analytical work (20%) to the reverse proportion. Kokina and Davenport (2017) note this shift in relation to auditing: artificial intelligence does not displace the auditor, but shifts their focus from mechanical verification to strategic analysis. For banks, this means that accounting ceases to be a 'cost centre' and transforms into a source of real-time management analytics.

Discussions often overlook an important aspect: an AI system in a bank requires constant supervision, verification and retraining on new data. It is essential to understand why the model classified a specific transaction in a particular way, as well as to identify systematic biases before they lead to breaches of regulatory standards. This function is performed by a specialist of a new profile — a bank accountant with expertise in data analysis and machine learning. The 'Digital Uzbekistan – 2030' programme provides training for such specialists: in the 2023/2024 academic year, 12 universities across the country are offering courses in 'Artificial Intelligence'.

CONCLUSION. The discussion of 'robot accountants' in the banking sector risks getting bogged down in futuristic scenarios if we fail to acknowledge the obvious: automation is already happening — slower than marketers promise, but faster than educational programmes and the regulatory framework can adapt. In Uzbekistan, this process is complicated by the fact that banks are still completing their basic digitalisation, whilst the state has already set itself the goal of entering the 'top 50' in the artificial intelligence readiness ranking. The gap between the strategic document and operational reality is not a shortcoming, but a normal part of any transformation; the main thing is not to turn a blind eye to it.

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The key conclusion is that a 'robotic accountant' is not a product to be purchased and implemented, but a new professional configuration emerging at the intersection of accounting logic, regulatory requirements and technological capabilities. Financial organisations that are the first to recognise this fact and begin training specialists with the appropriate profile – not merely 'users of artificial intelligence', but 'interpreters of artificial intelligence' – will gain a real competitive advantage. All other aspects, including the choice of a specific RPA platform or neural network model, are tactical rather than strategic in nature.

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