HOW DIGITAL TECHNOLOGIES ARE CHANGING ACCOUNTING

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Abstract

Digital technologies are transforming accounting from a manual process of data collection into an automated, analysis-oriented management system. The article examines the impact of cloud computing, ERP systems, robotic process automation (RPA), artificial intelligence, blockchain and big data analytics on accounting processes, reporting and auditing. The study is based on the analysis, comparison and systematization of foreign scientific literature and distinguishes three stages of digitalization: automation, digitization and digital transformation. The changes in the accounting profession are assessed, including the shift from entering documents to controlling data quality, analysis and advice, and the new skills this requires. Practical experience in Uzbekistan (electronic invoices, online control cash registers, electronic tax reporting, the transition to IFRS) is analyzed, and it is shown that digitalization has been fastest where state requirements made it mandatory. The article also identifies the main risks (cybersecurity threats, algorithm errors, shortage of personnel, high cost and regulatory gaps) and proposes ways to overcome them. The main conclusion: technologies do not replace the accountant but shift his or her role from technical record-keeping to analysis, control and advisory work.

Keywords: digital transformation, accounting, artificial intelligence, ERP, blockchain, automation, accounting profession, Uzbekistan.

Introduction

Over the past decade, accounting has moved from paper journals to digital systems operating in real time, and this process is accelerating further with the emergence of artificial intelligence [1], [2]. The relevance of the topic is determined by two factors: enterprises place high demands on the speed and accuracy of reporting, and the state is progressively digitalizing tax and reporting processes.

In accounting practice, repetitive operations (entering primary documents, reconciling bank statements, tax calculations) take up a large share of working time. These are precisely the operations that are the easiest to automate [3]. As a result, the accountant is now expected not to enter data but to interpret it and support decision-making.

The aim of the article is to determine the impact of digital technologies on accounting, reporting and the accounting profession, and to substantiate the directions of their application in the conditions of Uzbekistan. To achieve this aim, the following tasks were set:

- to review the theoretical foundations of digitalization;
- to classify the impact of key technologies on accounting processes;
- to assess the changes in the accounting profession;
- to analyze the practice of Uzbekistan and to identify the risks and recommendations.

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Methods

The study used the methods of analysis, comparison and systematization of foreign scientific literature.

1. Theoretical foundations of digitalization

The digitalization of accounting passes through three stages: automation, digitization and digital transformation. It is important to distinguish between them, because many enterprises stop at the first stage.

Automation. Existing manual operations are transferred to software (for example, keeping records in Excel or 1C). The process itself does not change.

Digitization. Primary documents move to electronic form and data are collected in a single database.

• **Digital transformation.** Data are analyzed and used to change management decisions and the business model.

Theoretically, this process rests on Klaus Schwab's concept of the "Fourth Industrial Revolution": the fusion of digital, physical and biological technologies changes the operating principles of economic systems. For accounting this means that what matters is not collecting data but processing and analyzing them in real time.

Two approaches are distinguished in the scientific literature. The first regards technologies as a tool of efficiency: costs fall and errors decline. The second assesses them as a force that changes the essence of the profession: the accountant becomes an information systems specialist and advisor.

Results

Six technologies have the greatest impact on accounting. Each of them affects a different stage of accounting (data collection, processing, verification, analysis) [4].

Technology	Essence	Impact on accounting
Cloud computing	Software and data are stored on a server accessed via the Internet	Access to the accounts from anywhere, real-time collaboration, reduced server costs
ERP systems	A single information base for finance, warehouse, sales and HR	Data are entered once, reports are generated automatically
RPA (robotic process automation)	A software robot performs rule-based repetitive actions	Time for entering invoices, reconciling bank statements and checking payments is reduced
Artificial intelligence and machine learning	The system identifies patterns in the data on its own	Automatic classification of documents, detection of anomalies and fraud, forecasting
Blockchain	A distributed, immutable ledger of transactions	Records are mutually confirmed between the parties, potential to simplify audit
Big data analytics	Processing of large volumes of unstructured data	Testing the full data set instead of a sample, in-depth analysis for management accounting

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Artificial intelligence. This is the fastest-developing area. Large audit firms use machine learning to read documents and identify unusual transactions, which moves the auditor's task from sample testing closer to full analysis [5], [6]. In recent years generative models have also appeared: they help answer questions about documents, prepare report texts and interpret accounting policies. However, a model's conclusion must be verified by a specialist.

Blockchain. Dai and Vasarhelyi proposed the idea of "triple-entry accounting": in addition to the enterprise's internal records, a transaction is also recorded in a shared ledger between the parties. This can reduce the risk of falsified records and make audit easier [7]. In practice, however, the technology is not yet widespread; its implementation is expensive and regulatory foundations are insufficient.

Big data. Traditional audit uses sample testing. Big data analytics, by contrast, makes it possible to test all transactions, which improves the quality of risk identification [8], [9]. For management accounting this means real-time analysis of costs and revenues, and accurate budgeting and forecasting [10], [11].

Technologies do not eliminate the accountant's tasks; they change their composition. Repetitive, rule-based work is automated, while work requiring judgment and professional assessment remains with the accountant [12].

Area	Traditional accountant	Accountant of the digital era
Main work	Entering documents, keeping records	Controlling data quality, analysis, advice
Tools	Journals, Excel, standalone programs	ERP, cloud platforms, analytics and automation tools
Reporting	Prepared at the end of the period	Generated in real time, monitored daily
Role	Recorder of information	Partner of management in decision-making

The skills required of the profession are also changing. In addition to technical knowledge, the following are becoming important:

- data analysis and visualization (Excel, Power BI, SQL basics);
- understanding of information systems and the principles of automated control;
- critical evaluation of the outputs of artificial intelligence;
- fundamentals of cybersecurity and data protection;
- the ability to explain complex financial information simply to managers [13], [14].

International professional organizations (ACCA and IMA) also emphasize that accountants' possession of digital skills will determine the future of the profession [15], [16]. Thus, an accountant who embraces technology increases his or her value, while those who ignore it end up doing work that quickly becomes obsolete.

In Uzbekistan, the digitalization of accounting is carried out mainly on state initiative, by improving tax administration. The following directions are the most important:

- **Electronic invoices.** Taxpayers exchange electronic invoices through operators, which makes it possible to keep primary documents paperless and to automatically reconcile data with the tax authorities [17].

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• **Online control cash registers.** In retail and services, every receipt is transmitted to the tax authority in real time. For the enterprise this means automatic accounting of sales; for oversight it means transparency [18].

• **Electronic tax reports and personal account.** Reports are submitted in electronic form, and the taxpayer monitors his or her calculations online.

• **Transition to international standards.** The new edition of the Law on Accounting and the relevant government resolutions introduced reporting under IFRS for certain categories of enterprises [19], [20]. This requires keeping financial data in digital systems under a single standard.

In practice, alongside locally widespread programs such as 1C, international ERP solutions are also used. While large enterprises and banks have moved to fully integrated systems, accounting in small and medium-sized business is still often only partially automated.

Experience shows that the transition was fast where state requirements made digitalization mandatory (invoices, cash registers). In voluntary areas (analytics, management accounting, artificial intelligence), staff readiness and the cost of the system remain barriers.

Discussion

Digitalization also gives rise to new risks. An enterprise that does not assess them in advance may spend the time it has saved on errors and losses.

Risk	Essence	Way to eliminate
Cybersecurity	Leakage of financial data, unauthorized access to the system	Restricting access rights, two-factor authentication, backup copies
Algorithm error	Artificial intelligence misclassifies or draws unfounded conclusions	Human verification of results, sample control
Shortage of personnel	Accountants lack digital skills	Retraining courses, updating curricula
High cost	The cost of the system, training and integration is burdensome for small business	Cloud subscription model, phased implementation
Regulatory gap	The legal status of blockchain and artificial intelligence records is unclear	Developing standards and guidelines of professional organizations

One of the most important risks is overreliance on technology. If an automated system is configured incorrectly, an error is repeated not once but in thousands of transactions. Therefore, internal control and the accountant's professional skepticism must be preserved in the digital environment as well [21].

Conclusion

Digital technologies are turning accounting from the activity of recording data into a function that serves analysis and management decisions. Cloud systems, ERP, RPA and artificial intelligence reduce repetitive work, while the accountant's role shifts toward control, interpretation and advice. In Uzbekistan,

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mandatory electronic invoices and online cash registers have accelerated the process, while in the areas of analytics and management accounting there is still great potential. Enterprises should digitalize step by step, starting with the repetitive processes that take the most time. Retraining programs for accountants in data analysis and information security should be established. It is necessary to introduce a procedure for human verification of the outputs of artificial intelligence, as well as internal control rules. It is advisable to integrate accounting disciplines with data analysis and information systems in higher education programs. Regulatory foundations should be developed for the legal status of blockchain and artificial intelligence records.

References

1. A. M. Rozario and M. A. Vasarhelyi, 'Auditing with smart contracts', Int. J. Digit. Account. Res., vol. 18, pp. 1–27, 2018.
2. G. Richins, A. Stapleton, T. C. Stratopoulos, and C. Wong, 'Big Data analytics: Opportunity or threat for the accounting profession?', J. Inf. Syst., vol. 31, no. 3, pp. 63–79, 2017.
3. D. Appelbaum, A. Kogan, and M. A. Vasarhelyi, 'Big Data and analytics in the modern audit engagement: Research needs', Audit. J. Pract. Theory, vol. 36, no. 4, pp. 1–27, 2017.
4. K. Yoon, L. Hoogduin, and L. Zhang, 'Big Data as complementary audit evidence', Account. Horiz., vol. 29, no. 2, pp. 431–438, 2015.
5. M. A. Vasarhelyi, A. Kogan, and B. M. Tuttle, 'Big Data in accounting: An overview', Account. Horiz., vol. 29, no. 2, pp. 381–396, 2015.
6. S. Cockcroft and M. Russell, 'Big Data opportunities for accounting and finance practice and research', Aust. Account. Rev., vol. 28, no. 3, pp. 323–333, 2018.
7. ACCA and IMA, 'Digital Darwinism: Thriving in the face of technology change', Association of Chartered Certified Accountants and Institute of Management Accountants, London, U.K., 2013.
8. A. Bhimani and L. Willcocks, 'Digitisation, `Big Data' and the transformation of accounting information', Account. Bus. Res., vol. 44, no. 4, pp. 469–490, 2014.
9. J. D. Warren Jr., K. C. Moffitt, and P. Byrnes, 'How Big Data will change accounting', Account. Horiz., vol. 29, no. 2, pp. 397–407, 2015.
10. Republic of Uzbekistan, 'Law of the Republic of Uzbekistan No. ZRU-404 "On accounting" (new edition)'. Apr. 13, 2016. [Online]. Available: https://lex.uz/docs/2931251
11. H. Issa, T. Sun, and M. A. Vasarhelyi, 'Research ideas for artificial intelligence in auditing: The formalization of audit and workforce supplementation', J. Emerg. Technol. Account., vol. 13, no. 2, pp. 1–20, 2016.
12. President of the Republic of Uzbekistan, 'Resolution No. PP-4611 "On additional measures for the transition to international financial reporting standards"'. Feb. 24, 2020.
13. L. A. Cooper, D. K. Holderness Jr., T. L. Sorensen, and D. A. Wood, 'Robotic process automation in public accounting', Account. Horiz., vol. 33, no. 4, pp. 15–35, 2019.
14. M. Marrone and J. Hazelton, 'The disruptive and transformative potential of new technologies for accounting, accountants and accountancy', Meditari Account. Res., vol. 27, no. 5, pp. 677–694, 2019.
15. J. Kokina and T. H. Davenport, 'The emergence of artificial intelligence: How automation is changing auditing', J. Emerg. Technol. Account., vol. 14, no. 1, pp. 115–122, 2017.
16. K. Schwab, The Fourth Industrial Revolution. Geneva, Switzerland: World Economic Forum, 2016.

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17. M. Ghasemi, V. Shafeiepour, M. Aslani, and E. Barvayeh, 'The impact of Information Technology (IT) on modern accounting systems', Procedia – Soc. Behav. Sci., vol. 28, pp. 112–116, 2011.
18. N. Kroon, M. do C. Alves, and I. Martins, 'The impacts of emerging technologies on accountants' role and skills: Connecting to open innovation—A systematic literature review', J. Open Innov. Technol. Mark. Complex., vol. 7, no. 3, p. 163, 2021.
19. J. Moll and O. Yigitbasioglu, 'The role of internet-related technologies in shaping the work of accountants: New directions for accounting research', Br. Account. Rev., vol. 51, no. 6, p. 100833, 2019.
20. J. Dai and M. A. Vasarhelyi, 'Toward blockchain-based accounting and assurance', J. Inf. Syst., vol. 31, no. 3, pp. 5–21, 2017.
21. G. Vial, 'Understanding digital transformation: A review and a research agenda', J. Strateg. Inf. Syst., vol. 28, no. 2, pp. 118–144, 2019.

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