IRSTI 06.73.15

A.K. Nizamdinova[1]
A.S. Kzykeyeva[2]
A.Z. Arystambayeva[3]
[1]*Al-Farabi Kazakh National University, Almaty, Kazakhstan*
[2]*Narxoz University, Almaty, Kazakhstan*
[3]*Al-Farabi Kazakh National University, Almaty, Kazakhstan*
(E-mail: [1]aknizamdinova@mail.ru, [2]aiganym.kzykeyeva@narxoz.kz, [3]almyra73@mail.ru)

Introduction of artificial intelligence technologies in the organization of auditing activities

Abstract. *The article focuses on the potential of implementing artificial intelligence (AI) technologies in the audit industry and explores the advantages of such integration. The aim of the research is to investigate the feasibility of incorporating AI technologies into financial audit business processes. The study addresses several tasks, including examining the current state of the audit industry, describing the company's business processes, analyzing the potential of introducing AI technologies into the business processes of companies, and revealing the outcomes of such an approach. The article concludes that the adoption of AI technologies can help companies reduce costs, enhance the quality of audits, attract new clients, and decrease staff turnover in audit firms, highlighting the importance of implementing AI technologies in the business processes of audit companies [1].*
During the pandemic, many companies experienced various changes in their business, and audit companies are no exception. The pandemic has given impetus to the digitalization of business processes, and the current capabilities of artificial intelligence and Big Data technologies make it possible to improve business processes. Therefore, this article considers the possibility of introducing artificial intelligence technologies as a growth point for audit companies.
Keywords: *audit, audit quality, artificial intelligence, risk.*

DOI: https://doi.org/10.32523/2789-4320-2023-2-285-295

Introduction

The audit of financial statements is the verification of reports on the company's finances, which is implemented by an expert auditor who is not related to the company and its activities [1]. The work of the audit here consists in the accumulation of audit evidence, in analytical processes and the formation of a set of functioning documents. All this audit activity is still mostly manual work [2].

At the time of the outbreak of the pandemic, it was almost impossible to conduct an audit in an offline environment, because, firstly, the auditor did not physically have access to the audited documentation and asset data, which prevented drawing up an opinion on the authenticity of the documents provided, and, secondly, he did not have the opportunity to establish face-to-face communication with company employees in the usual for them, the environment, which also led to difficulties in drawing up an audit opinion. Even if the expert could be sent documents, he still could not work with them in full, since he needed explanations and comments on many types of documentation, and had to spend a lot of time and effort on correspondence interaction. For these reasons, the audit examination for organizations was suspended during the lockdown.

This fact contributed to the widespread increase in loan debts and the formation of problems associated with the inability to pay for previously conducted examinations. Another global problem was the problem of companies with accounting and tax service: the deadlines for the delivery of reports already issued according to all standards were postponed indefinitely. Also, the documents for the fixed annual report according to International Financial Reporting Standards could not be approved

in a timely manner, which also led to a violation of the procedure for the timing of audits and the issuance of expert opinions.

Based on all of the above, it can be noted that virtually all audit companies were also experiencing a crisis at that time. Some of them were never able to return to work after the pandemic: for the most part, this applies to small firms that could not retain their real customers and did not acquire new ones. Accordingly, today there is a significant decrease in the number of such companies in the industry.

The big data methodology assumes a different perspective on the actual audit processes. Big Data is based on algorithms that allow the system to self-learn, automate processes more and more to improve the quality of work. The undoubted advantage of the practical application of the Big Data methodology is an integrated approach to solving the problem, allowing it to be evaluated from all sides.

Methodology

The data were analyzed using percentages, tables and the order of the ranks of the spearmen correlation methods and with the Statistical Package for Social Sciences (SPSS) were used for testing regression analysis measure the impact of digital transformation on internal audit quality and its impact on the quality of financial statements at the level of 95% confidence.

Discussion

In the process of turning to the use of Industry 4.0 technologies, the revealed potential of digitalization processes (AI, Big Data analytics, cloud technologies, cybernetization of business processes, etc.) and openness to consumers in the information and new technologies market will stimulate practical application and demand for audit services at a fundamentally more effective level, and will also have reducing the complexity of data collection and analytics processes. In the fall of 2016 the Corporate Group of the International Auditing and Assurance Standards Board (IAASB) introduced a provision that contained some recommendations.

Thus, companies providing audit services were instructed to make a bias towards the practical application of modern technologies (artificial intelligence systems, providing for Big Data analysis). According to the consulting company Frost & Sullivan [3], in 2022 the volume of the global market for artificial intelligence technologies amounted to $52.5 billion ($13.4 billion compared to 2017).

According to Deloitte's annual report, thanks to the introduction of digital technologies, the audit firm's revenues are increasing by 23%, and by 2022 this figure had to reach 30%. Deloitte's innovative solutions in the field of automation of robotic processes, risk identification and intelligent analytics provide a 13% increase in revenue from the provision of risk assessment consulting services.

Despite the statements of the management of the companies of the Big Four countries about the transition to digital technologies, practical innovations are still far from perfect and therefore require a systematic approach and the development of a cognitive ecosystem of auditing activities. With the help of the formation of a cognitive system, the problems of achieving maximum effect as a result of integrating the capabilities of individual intelligent systems and cognitive technologies to perform specific applied tasks in the field of audit will be solved [4].

Artificial intelligence, in conjunction with descriptive and predictive analysis of a large amount of information, somehow modifies the methodology of individual audit expertise, including an increasing variety of consulting services. For many businessmen, it is important, first of all, an expert assessment of risks and opportunities for the enterprise, the development of a model for the further functioning of the organization at all levels, including an assessment of the technological component of a particular firm . As you know , artificial intelligence is being introduced everywhere in almost all spheres of our life and to some extent transforms the usual methods of work.

Artificial intelligence also has another advantage due to the fact that when programming, it is possible to implement such a function that will allow for each individual case to immediately indicate all the features of working with a specific customer, which will contribute to the rationalization of all activities. In general, the initiative to introduce artificial intelligence in audits in the long term will help to improve the performance of companies in the following points [5]:

1. Reduce the number of employees, at the same time reduce the cost of wages and rent payments;
2. Improve the quality of the audit of financial statements, thereby increase the brand's reputation in the market;
3. Reduce the time-cost of conducting inspections;
4. Increase the number of customers by reducing time-costs and labor costs; and
5. Make the audit cheaper for the end customer without changing the profitability of the enterprise.

Thus the introduction of artificial intelligence into the business processes of audit companies is one of the main points. During the pandemic, the digitalization of business processes is accelerating, and perhaps soon the entire audit industry will change. The audit of financial statements will be more accessible to customers, will be done much faster, and audit companies themselves will dramatically improve business processes. Experts suggest that data analytics technologies and artificial intelligence (AI) will revolutionize the auditing profession [6]. These advancements are expected to automate tasks, expand the scope of auditing, reduce processing times, and ultimately enhance audit quality [7]. These technologies are also useful for addressing changes in business processes, which generate a significant amount of data that makes some manual auditing methods obsolete or unfeasible [8]. This has made auditing a prime area for AI, with the big four accounting firms investing in and implementing AI for external auditing [9].

AI is a technology that emulates human judgment and cognitive abilities and can interpret environmental cues to assess risks and make decisions, forecasts, or measures. Unlike traditional software, AI systems can learn from data and self-monitor over time without being explicitly programmed by humans [10]. The Big Four audit firms have made substantial investments in AI for consulting and assurance services. AI can effectively examine real-time unstructured data and provide precise analysis of numerical, textual, and visual data, helping to identify high-risk areas in the face of big data [11].

Research has also indicated the relevance of these technologies for internal auditing [12]. Internal auditing is an independent and objective assurance and consulting activity that aims to improve an organization's operations [7]. Verification engagements are conducted to achieve this goal. Even during internal audit engagements, drawing samples of transactions and comparing them with guidelines is still crucial for gathering and evaluating information. With the application of AI technology and the expansion of internal audit functions, the meaning of internal audit is constantly evolving [13].

Artificial intelligence has been identified as a key component of the Fourth Industrial Revolution and is expected to have a significant impact on a wide range of jobs [14-16]. According to various predictions, the adoption of AI is likely to increase efficiency and cost-effectiveness, as well as improve the quality of audits in the field of auditing [16-18]. However, while studies have been conducted on the use of technology in auditing firms, there has been limited research specifically devoted to the implementation of AI among auditors. Many applications of AI technology that have been discussed in academic and popular press are focused on large datasets and organizations used by specialists.

In many countries, small and medium-sized enterprises (SMEs) account for a large proportion of the client base for auditing firms [19]. The profession of auditing has undergone changes that have increased the time and expense of auditing SMEs. These changes include additional requirements for quality control, compliance with new standards, and more comprehensive supervision of auditors [18]. Coordination, standardization, and automation can be a solution to optimize the work of auditors and reduce the cost of auditing SMEs [20-21].

Gartner, a leading research and advisory company, has identified the implementation of applied AI technologies in various workplaces and processes as one of the three main technological transitions that will have a significant impact on social development in the coming years[22]. They note that AI is a multi-purpose technology that can be used to improve and change the use of other technologies and processes.

One way to illustrate the reach of AI technologies is the map shown in Figure 1 [23]. The figure provides an overview of some AI development methods and technologies in combination with various AI applications.

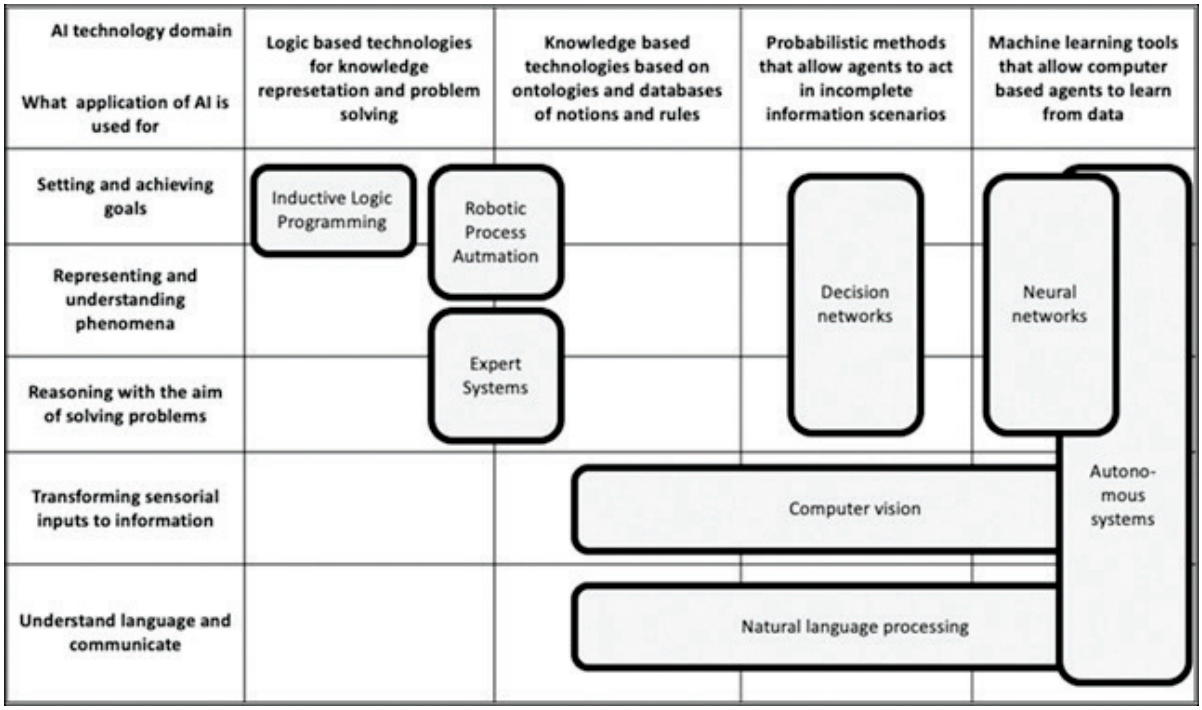

Figure 1 – AI technology and application map based on AI technology domains

The aforementioned technologies can be combined with other technologies such as computer vision, which involves methods for capturing and understanding digital images, and natural language processing, which is utilized to gather and analyze language data and interact with AI applications.

As technology continues to advance, academic research on artificial intelligence in auditing is also evolving. The definition of artificial intelligence is now broader than ever before. For example, Sutton's definition [21] of accounting-related AI divides it into knowledge-based systems and machine learning, which includes only a subset of the technologies displayed in Figure 1. In their review, Issa, Sun and Vasarhelyi focus solely on expert systems and neural networks [24]. Given the rapid pace of AI development, academic research must adapt by utilizing flexible definitions and frameworks that fully encompass the variety of technologies encompassed by the "AI umbrella" [25, 21].

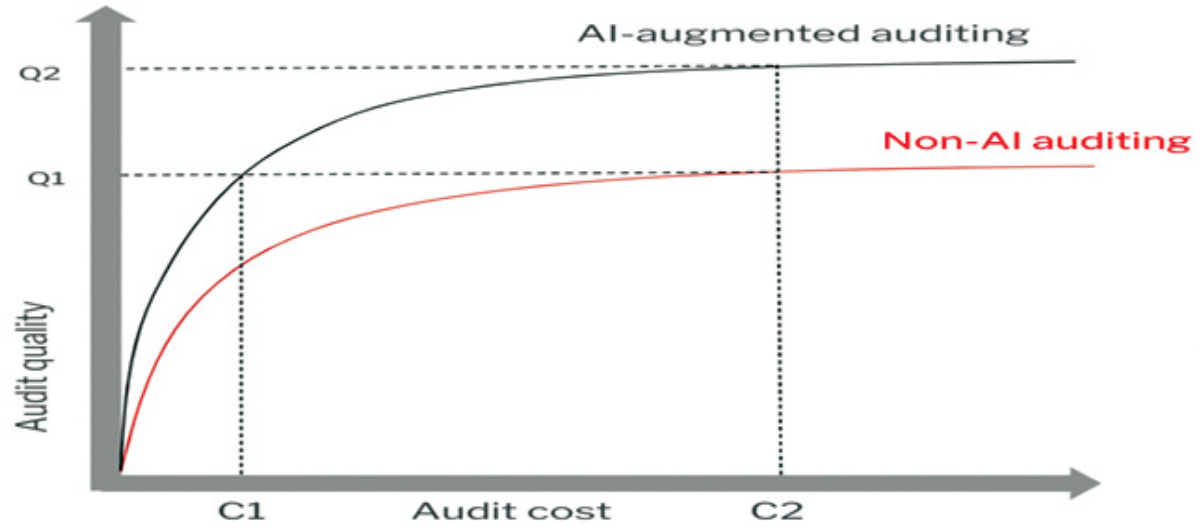

Figure 2 – The impact of AI on audit quality

The data analysis and testing were carried out to examine the hypothesis that there is no significant statistical relationship between the use of artificial intelligence techniques and the improvement of internal auditing activities. The alternative hypothesis (H1) suggests the existence of a significant relationship between the use of artificial intelligence techniques and the enhancement of internal auditing activities. The means, standard deviations, and significance level of the paragraph were utilized by the researcher to either accept or reject the null hypothesis or alternative hypothesis [26]. The findings are presented in the table below.

Table 1

This dimension consists of statements that assess the impact of utilizing artificial intelligence techniques on improving internal auditing activities

Serial	This dimension comprises statements that assess the impact of utilizing artificial intelligence techniques on improving internal auditing functions.	Mean	Std. Deviation	Arranging Materiality of Paragraph	Materiality
1	The utilization of artificial intelligence techniques in internal audit activities aids in bolstering the professional competence of internal auditors, by enabling quick problem resolution and revealing novel approaches for problem analysis and solution proposals.	4.31	0.68	7	High
2	By continuously monitoring newly developed technology systems, it is possible to broaden the scope of regulatory audits to encompass changes in the control environment of a facility.	4.31	0.74	5	High
3	The utilization of digital technology in internal audit necessitates regular training for internal auditors, thereby impact their professional competencies and experience.	4.36	0.85	3	High
4	Digital technologies utilized in internal auditing activities aid in promoting the independence of internal auditors.	4.17	0.89	10	High
5	The proficient use of artificial intelligence aids internal auditors in conducting financial audits by linking multiple data sources and presenting a cohesive and comprehensive view of the company's operations.	4.29	0.78	9	High
6	Artificial intelligence techniques enable the internal audit to provide advisory and assurance services that aid management in achieving the company's objectives.	4.34	0.74	4	High
7	The implementation of artificial intelligence mechanisms in internal audit activities enhances communication and oversight by providing written channels, consistent plans, and structured procedures.	4.31	0.68	6	High
8	Utilizing artificial intelligence mechanisms in operational audit activities can enhance the company's operational efficiency and effectiveness.	4.30	0.72	6	High
9	The use of digital technology in managing internal audit activities can help safeguard information and maintain backup copies for future use.	4.44	0.76	1	High
10	The utilization of digital security measures in internal audit activities aids in the implementation of control measures that safeguard information, maintain the confidentiality of its circulation, and prevent unauthorized access or intrusion.	4.37	0.77	4	High
11	The use of digital technologies in operational audits enables decision makers within the organization to obtain relevant information to support their decision-making process.	4.55	0.63	2	High
12	Channels of communication between the internal audit, the board of directors, and stakeholders are established through the use of artificial intelligence techniques to coordinate work and examine internal and external communication protocols.	4.16	0.83	8	High
Source: SPSS program outputs.					

The first dimension consists of statements that measure the impact of implementing artificial intelligence mechanisms on improving internal auditing activities. The mean score of these statements ranged between 4.17 and 4.55, which is higher than the overall mean score of all questions (3.93). The statement "The application of digital technologies in operational audit activities contributes to providing information to decision makers within the company" had the highest mean score of 4.55 and a standard deviation of 0.63, while the statement "The use of digital technologies in internal audit activities works to support the independence of the internal auditor" had the lowest mean score of 4.17 and a standard deviation of 0.89.

Based on the results of the survey, the researcher concludes that there is a consensus among the respondents that digital transformation enhances the quality of internal auditing. The mean score of the questions in the first dimension was above 4, indicating a high level of agreement. Furthermore, the mean of the overall mean score of the questions in the first dimension was 3.93, which was also high. Therefore, the researcher accepted the alternative hypothesis that there is a statistically significant relationship between the use of artificial intelligence techniques and the enhancement of internal auditing activities, and rejected the null hypothesis.

Results

New challenges in the field of internal audit are the digitalization of all company activities. These problems are forcing internal audit to increasingly implement data-based processes. Auditing is increasingly using artificial intelligence techniques, such as neural networks, to overcome these problems. Auditors should understand the basics of artificial intelligence, determine the roles they should play, identify the risks and opportunities of AI, prepare for changes, review their role and adapt to process automation.

According to reports from accounting firms, the utilization of artificial intelligence (AI) in their audit and advisory functions has resulted in time and cost savings, faster data analysis, greater accuracy, improved understanding of business processes, and enhanced precision. AI technology is designed to replicate human cognitive abilities and decision-making processes, which provides users with competitive advantages. As a result, all four of the largest accounting firms have disclosed their usage of AI and their plans to continue to innovate in areas such as risk assessment for audit planning, transaction testing, and the analysis and creation of audit working documents [14].

Auditors are increasingly aware of the potential impact of AI on their work [27]. There have been many predictions about which jobs will be lost, which will change, and which new jobs will emerge as AI develops and is implemented more widely.

A study by McKinsey analyzed over 820 different professions and found that less than 5% of them could be fully automated. However, more than 60% of these professions had tasks that could be automated to some degree, with over 30% of their tasks being fully automatable [28]. Thus, it is likely that job roles will evolve rather than be completely replaced by AI.

In general, it is expected that the development and implementation of AI will be evolutionary rather than a revolutionary «big bang» [29-30]. The impact of AI on auditing is likely to depend largely on how this technology is developed and adopted.

Conclusion

After discussing the theoretical and empirical aspects of this study, we have achieved the following important results in both theoretical and practical areas:

– The quality of internal audit in the light of artificial intelligence contributes to the creation of value for the company and the provision of suggestions, advice and recommendations for the continuous improvement of management systems, which improves the quality of financial statements.

– AI has a significant impact on enhancing the quality and reliability of financial statement information and ensuring the accuracy of organizational data verification during audits.

– Traditional manual systems used for internal audit are not consistent with continuous economic development in the business environment; it should be based on the application of artificial intelligence.

Based on the results of the study, we offer the following recommendations.

– Training programs should be designed and implemented to qualify accountants on the application of artificial intelligence and keep up with new developments.

– Publication of new regulations and laws regulating the use of artificial intelligence in internal audits to ensure the safety and protection of users.

– Development of various courses on artificial intelligence and internal audit to include all the points studied and discussed in this study.

– The use of artificial intelligence in all corporate activities.

References

1. Менькин Л. О. Внедрение технологий искусственного интеллекта в бизнес-процессы аудиторских организаций//Инновации и инвестиции.-2021.- №6.-С.90-93.

2. Аудиторский рынок 2020: дистанция и цифровизация. [Электронный ресурс] - URL: https://delprof.ru/press-center/experts-pubs/auditorskiy-rynok-2020-distantsiya-i-tsifrovizatsiya/ (дата обращения: 12.12.2022).

3. Frost & Sullivan. [Электронный ресурс] - URL: https://clck.ru/KU6r4 (дата обращения: 22.12.2022).

4. «Большая четверка» доведет аудит до автоматизма. [Электронный ресурс] - URL: https://www.vedomosti.ru/management/articles/2016/03/30/635611-bolshaya-chetverka-dovedet-audit-avtomatizma (дата обращения: 12.03.2023).

5. Набиев Э.Ш. Внедрение искусственного интеллекта в бизнесе.// Инновации и инвестиции. -2019.- №7. [Электронный ресурс] - URL: https://cyberleninka.ru/article/n/vnedrenie-iskusstvennogo-intellekta-v-biznes (дата обращения: 22.12.2022).

6. Gepp A., Linnenluecke M. K., O'Neill T. J., & Smith T. Big data techniques in auditing research and practice: Current trends and future opportunities. //Journal of Accounting Literature.-2018.- 40. -P.102-115.

7. Nonnenmacher J., Kruse F., Schumann G., & Marx Gómez J. Using Autoencoders for Data-Driven Analysis in Internal Auditing. //In Proceedings of the 54th Hawaii International Conference on System Sciences.-2021. -P.5748-5757.

8. Chiu V., Liu Q., & Vasarhelyi M. A. The development and intellectual structure of continuous auditing research. //Journal of Accounting Literature.-2014.- №33(1-2).-C. 37-57.

9. Sun T., & Vasarhelyi M.A. Embracing textual data analytics in auditing with deep learning.-C. 49–67(2018).

10. Shaw J. Artificial intelligence and ethics: Ethics and the dawn of decision-making machines. [Электронный ресурс]- 2019. - URL: https://harvardmagazine.com/2019/01/artificial-intelligencelimitations (дата обращения: 15.12.2022).

11. Munoko I., Brown-Liburd H. L., & Vasarhelyi M. The ethical implications of using artificial intelligence in auditing. //Journal of Business Ethics.- 2020.-№ 167(2).-C. 209-234.

12. Salijeni G., Samsonova-Taddei A., & Turley S. Big Data and changes in audit technology: contemplating a research agenda. //Accounting and business research.- 2019.-№ 49(1).-P.95-119.

13. Li E., Xu H., & Li G. Analysis on Improvement of Internal Audit in China's Listed Companies Based on Artificial Intelligence.// In 3rd International Conference on Advances in Management Science and Engineering. Atlantis Press.-2020.-P. 25-30.

14. Rikhardsson P., K. R. Thórisson, G. Bergthorsson, and C. Batt. Artificial intelligence and auditing in small- and medium-sized firms: Expectations and applications.// AI Magazine.-2022.-№ 43.-P. 323–36. https://doi.org/10.1002/aaai.12066

15. Schwab K., N. Davis and S. Nadella. Shaping The Fourth Industrial Revolution.// World Economic Forum. -2018.

16. Kokina J., and T. H. Davenport. The Emergence of Artificial Intelligence: How Automation is Changing Auditing. //Journal of Emerging Technologies in Accounting.- 2017.-№ 14(1).-C. 115–22. https://doi.org/10.2308/jeta-51730

17. ICAEW. Artificial Intelligence and the Future of Accountancy. [Электронный ресурс] -2018.- URL: https://www.icaew.com/en/technical/information-technology/technology/artificial-intelligence-thefuture-of-accountancy (дата обращения: 03.03.2023)

18. Raphael J. How Artificial Intelligence can Boost Audit Quality. CFO. [Электронный ресурс] -2015.- URL: https://www.cfo.com/auditing/2015/06/artificial-intelligence-can-boost-audit-quality/ (дата обращения: 20.03.2023).

19. Mohsin M. 10 Small Business Statistics Every Future Entrepreneur Should Know In 2022. [Электронный ресурс] -2022. - URL: https://au.oberlo.com/blog/small-business-statistics (дата обращения: 20.03.2023).

20. Basuony M.A. K., M. Tarek, M.M. Hussain, and E.K.A. Mohamed. The Implication of Information Technology on the Audit Profession in Developing Country.// International Journal of Accounting & Information Management.- 2017.-№25(2).-C. 237–55.

21. Sutton S. G., M. Holt, and V. Arnold. The Reports of My Death are Greatly Exaggerated — Artificial Intelligence Research in Accounting. //International Journal of Accounting Information Systems 2015 Research Symposium on Information Integrity & Information Systems Assurance.-2016.-№ 22.-C. 60–73.

22. Emerging Technology Trends and 2018 Hype Cycle. [Электронный ресурс] - URL: https://www.gartner.com/en/newsroom/press-releases/2018-08-20-gartner-identifies-five-emerging-technology-trends-thatwill-blur-the-lines-between-human-and-machine (дата обращения: 25.02.2023).

23. Corea F. AI Knowledge Map: How to Classify AI Technologies. [Электронный ресурс].-2018. - URL: https://www.forbes.com/sites/cognitiveworld/2018/08/22/ai-knowledge-map-how-to-classify-ai-technologies/ (дата обращения: 12.12.2023).

24. Issa H., T. Sun, M. A. Vasarhelyi. Research Ideas for Artificial Intelligence in Auditing: The Formalization of Audit and Workforce Supplementation. Journal of Emerging Technologies in Accounting.-2017. -№ 13(2).-C.1–20.

25. Gray G.L., V. Chiu, Q. Liu, and P. Li. The Expert Systems Life Cycle in AIS Research: What Does It Mean for Future AIS Research? International Journal of Accounting Information Systems 2013 Research Symposium on Information Integrity & Information Systems Assurance.-2014.-№ 15(4).-C. 423–451.

26. Monzer Mohammed Ali. The Effect of Activating Artificial Intelligence techniques on Enhancing Internal Auditing Activities «Field Study». Alexandria Journal of Accounting Research, 6. [Электронный ресурс].-2022. - URL: https://www.researchgate.net/publication/360919585_The_Effect_of_Activating_Artificial_Intelligence_techniques_on_Enhancing_Internal_Auditing_Activities_Field_Study (дата обращения: 20.02.2023).

27. Tiberius V., and S. Hirth. Impacts of Digitization on Auditing: A Delphi Study for Germany. Journal of International Accounting, Auditing and Taxation.- 2019. -№ 37.-C. 100288.

28. McKinsey Global Institute. (2017). Jobs Lost, Jobs Gained: Workforce Transitions in a Time of Automation.

29. Ford M. Rise of the Robots: Technology and the Threat of a Jobless Future. New York: Basic Books, 2016.

30. Susskind D. World Without Work: Technology, Automation and How We Should Respond. London: Penguin,2020.

А.К. Низамдинова[1], А.С. Кзыкеева[2], А.З. Арыстамбаева[3]

[1]Әл-Фараби атындағы Қазақ ұлттық университеті, Алматы, Қазақстан

[2]Нархоз университеті, Алматы, Қазақстан

[3]Әл-Фараби атындағы Қазақ ұлттық университеті, Алматы, Қазақстан

Аудиторлық қызметті ұйымдастыруға жасанды интеллект технологияларын енгізу

Аңдатпа. Мақала аудит саласына жасанды интеллект технологияларын енгізу мүмкіндігіне арналған және мұндай енгізудің пайдасы қарастырылады. Зерттеудің мақсаты қаржылық аудиттің бизнес-процестеріне AI технологияларын енгізу мүмкіндігін зерттеу болып табылады. Зерттеу барысында келесі міндеттер шешілді: аудит саласындағы ағымдағы жағдай зерттелді, компанияның бизнес-процестері сипатталды, компаниялардың бизнес-процестеріне жасанды интеллект технологияларын енгізу мүмкіндігі талданды, осындай шешімнің нәтижелері анықталды. Жұмыста жасанды интеллект технологиялары компаниялардың шығындарын азайтуға, аудит сапасын жақсартуға, жаңа клиенттерді тартуға және аудиторлық компаниялардағы қызметкерлердің айналымын азайтуға мүмкіндік береді деген қорытындыға

келді. Мұның бәрі аудиторлық компаниялардың бизнес-процестеріне жасанды интеллектті енгізу мәселелерін өзекті етеді [1].

Пандемия кезінде көптеген компаниялар өз бизнесінде әртүрлі өзгерістерге ұшырайды және аудиторлық компаниялар да ерекшелік емес. Пандемия бизнес-процестерді цифрландыруға серпін берді, ал Big Data жасанды интеллект пен технологияның қазіргі мүмкіндіктері бизнес-процестерді жақсартуға мүмкіндік береді. Сондықтан бұл мақалада аудиторлық компаниялар үшін өсу нүктесі ретінде жасанды интеллект технологияларын енгізу мүмкіндігі қарастырылады.

Түйін сөздер: аудит, аудит сапасы, жасанды интеллект, тәуекел.

А.К. Низамдинова[1], А.С. Кзыкеева[2], А.З. Арыстамбаева[3]
[1]Казахский национальный университет им. аль-Фараби, Алматы, Казахстан
[2]Университет Нархоз, Алматы, Казахстан
[3]Казахский национальный университет им. аль-Фараби, Алматы, Казахстан

Внедрение технологий искусственного интеллекта в организацию аудиторской деятельности

Аннотация. В данной статье рассматривается возможность использования технологий искусственного интеллекта в сфере аудита, а также анализируются преимущества, которые могут быть получены от такого внедрения. Основной целью исследования является изучение возможности внедрения ИИ-технологий в бизнес-процессы финансового аудита. В ходе работы были проведены следующие задачи: изучение текущего состояния в отрасли аудита, описание бизнес-процессов компаний, анализ возможности внедрения технологий искусственного интеллекта в бизнес-процессы компаний и выявление результатов такого внедрения. Исследование показало, что использование технологий искусственного интеллекта позволяет сократить расходы компаний, повысить качество аудита, привлечь новых клиентов и снизить текучесть персонала в аудиторских компаниях. В связи с этим, вопросы внедрения искусственного интеллекта в бизнес-процессы аудиторских компаний остаются актуальными [1].

В условиях пандемии многие компании сталкиваются с изменениями в своей деятельности, и аудиторские компании не являются исключением. Кризис привел к ускорению цифровизации бизнес-процессов, а использование современных технологий искусственного интеллекта и анализа больших данных может значительно улучшить эффективность этих процессов. В этой статье рассматривается возможность использования технологий искусственного интеллекта в качестве ростовой точки для аудиторских компаний.

Ключевые слова: аудит, качество аудита, искусственный интеллект, риск.

References

1. Menkin L. O. Vnedrenie tekhnologii iskusstvennogo intellekta v biznes-protsessy auditorskikh organizatsii.Innovatsii i investitsii, [Introduction of artificial intelligence technologies into business processes of audit organizations. Innovation and investment], 6, 90-93(2021).
2. Auditorskij rynok 2020: distanciya i cifrovizaciya [Audit Market 2020: Distance and Digitalization]. Available at: https://delprof.ru/press-center/experts-pubs/auditorskiy-rynok-2020-distantsiya-i-tsifrovizatsiya/ (Accessed: 12.12.2022).
3. Frost & Sullivan. Available at: https://clck.ru/KU6r4 (Accessed: 22.12.2022).
4. «Bol'shaya chetverka» dovedet audit do avtomatizma. [The Big Four will bring the audit to automatism]. Available at: https://www.vedomosti.ru/management/articles/2016/03/30/635611-bolshaya-chetverka-dovedet-audit-avtomatizma (Accessed: 12.03.2023).
5. Nabiev E.Sh. Vnedrenie iskusstvennogo intellekta v biznese. Innovacii i investicii [Introduction of artificial intelligence in business. Innovations and investments], 7(2019). Available at: https://cyberleninka.ru/article/n/vnedrenie-iskusstvennogo-intellekta-v-biznes (Accessed: 22.12.2022).
6. Gepp A., Linnenluecke M.K., O'Neill T. J., & Smith T. Big data techniques in auditing research and practice: Current trends and future opportunities. Journal of Accounting Literature, 40, 102-115(2018).

7. Nonnenmacher J., Kruse F., Schumann G., & Marx Gómez, J. Using Autoencoders for Data-Driven Analysis in Internal Auditing. In Proceedings of the 54th Hawaii International Conference on System Sciences, 5748-5757(2021).

8. Chiu V., Liu Q., & Vasarhelyi M.A. The development and intellectual structure of continuous auditing research. Journal of Accounting Literature, 33(1-2), 37-57(2014).

9. Sun T., & Vasarhelyi M. A. Embracing textual data analytics in auditing with deep learning, 49–67(2018).

10. Shaw J. Artificial intelligence and ethics: Ethics and the dawn of decision-making machines. Available at: https://harvardmagazine.com/2019/01/artificial-intelligencelimitations (Accessed: 15.12.2022).

11. Munoko I., Brown-Liburd H.L., & Vasarhelyi M. The ethical implications of using artificial intelligence in auditing. Journal of Business Ethics, 167(2), 209-234(2020).

12. Salijeni G., Samsonova-Taddei A., & Turley S. Big Data and changes in audit technology: contemplating a research agenda. Accounting and business research, 49(1), 95-119(2019).

13. Li E., Xu H., & Li G. Analysis on Improvement of Internal Audit in China's Listed Companies Based on Artificial Intelligence. In 3rd International Conference on Advances in Management Science and Engineering. Atlantis Press, 25-30, 2020.

14. Rikhardsson P., K. R. Thórisson, G. Bergthorsson, and C. Batt Artificial intelligence and auditing in small- and medium-sized firms: Expectations and applications. AI Magazine, 43, 323–36(2022). https://doi.org/10.1002/aaai.12066

15. Schwab K., N. Davis, S. Nadella Shaping The Fourth Industrial Revolution. World Economic Forum(2018).

16. Kokina J., T. H. Davenport. The Emergence of Artificial Intelligence: How Automation is Changing Auditing. Journal of Emerging Technologies in Accounting, 14(1), 115–22(2017). https://doi.org/10.2308/jeta-51730

17. ICAEW. Artificial Intelligence and the Future of Accountancy. - Available at: https://www.icaew.com/en/technical/information-technology/technology/artificial-intelligence-thefuture-of-accountancy (Accessed: 03.03.2023)

18. Raphael J. How Artificial Intelligence can Boost Audit Quality. CFO. Available at: https://www.cfo.com/auditing/2015/06/artificial-intelligence-can-boost-audit-quality/ (Accessed: 20.03.2023).

19. Mohsin M. 10 Small Business Statistics Every Future Entrepreneur Should Know In 2022. Available at: https://au.oberlo.com/blog/small-business-statistics (Accessed: 20.03.2023).

20. Basuony M.A.K., M. Tarek, M.M. Hussain, E.K.A. Mohamed. The Implication of Information Technology on the Audit Profession in Developing Country. International Journal of Accounting & Information Management, 25(2), 237–55(2017).

21. Sutton S.G., M. Holt, V. Arnold. The Reports of My Death are Greatly Exaggerated — Artificial Intelligence Research in Accounting. International Journal of Accounting Information Systems 2015 Research Symposium on Information Integrity & Information Systems Assurance, 22, 60–73(2016).

22. Emerging Technology Trends and 2018 Hype Cycle. Available at: https://www.gartner.com/en/newsroom/press-releases/2018-08-20-gartner-identifies-five-emerging-technology-trends-thatwill-blur-the-lines-between-human-and-machine (Accessed: 25.02.2023).

23. Corea F. AI Knowledge Map: How to Classify AI Technologies. Available at: https://www.forbes.com/sites/cognitiveworld/2018/08/22/ai-knowledge-map-how-to-classify-ai-technologies/ (Accessed: 12.12.2023).

24. Issa H., T. Sun, M.A. Vasarhelyi. Research Ideas for Artificial Intelligence in Auditing: The Formalization of Audit and Workforce Supplementation. Journal of Emerging Technologies in Accounting, 13(2), 1–20(2017).

25. Gray G.L., V. Chiu, Q. Liu, P. Li. The Expert Systems Life Cycle in AIS Research: What Does It Mean for Future AIS Research? International Journal of Accounting Information Systems 2013 Research Symposium on Information Integrity & Information Systems Assurance, 15(4), 423–451.

26. Monzer Mohammed Ali. The Effect of Activating Artificial Intelligence techniques on Enhancing Internal Auditing Activities «Field Study». Alexandria Journal of Accounting Research, 6. Available at: https://www.researchgate.net/publication/360919585_The_Effect_of_Activating_Artificial_Intelligence_techniques_on_Enhancing_Internal_Auditing_Activities_Field_Study (Accessed: 20.02.2023).

27. Tiberius V., S. Hirth Impacts of Digitization on Auditing: A Delphi Study for Germany. Journal of International Accounting, Auditing and Taxation, 37, 100288(2019).

28. McKinsey Global Institute. Jobs Lost, Jobs Gained: Workforce Transitions in a Time of Automation (2017).

29. Ford M. Rise of the Robots: Technology and the Threat of a Jobless Future. (New York, Basic Books,2016).

30. Susskind D. World Without Work: Technology, Automation and How We Should Respond. (London, Penguin, 2020).

Information about authors:

Низамдинова А.К. – к.э.н., старший преподаватель кафедры «Финансы и учет», Казахский национальный университет им. аль-Фараби, Алматы, Казахстан.

Кзыкеева А.С. – старший преподаватель школы экономики и менеджмента, Университет Нархоз, Алматы, Казахстан.

Арыстамбаева А.З. – старший преподаватель кафедры «Финансы и учет», Казахский национальный университет им. аль-Фараби, Алматы, Казахстан.

Nizamdinova A. K. – C.E.Sc, Senior Lecturer of the Department of Finance and Accounting, Al-Farabi Kazakh National University, Almaty, Kazakhstan.

Kzykeyeva A.S. – Senior Lecturer, School of Economics and Management, Narxoz University, Almaty, Kazakhstan.

Arystambayeva A.Z. – Senior Lecturer of the Department of Finance and Accounting, Al-Farabi Kazakh National University, Almaty, Kazakhstan.