IMPLICATIONS OF ARTIFICIAL INTELLIGENCE IN AUDIT PROCESSES

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Abstract: *In recent decades, the spread of artificial intelligence has been witnessed with interest. With the advent of Industry 4.0, the auditing profession is changing dramatically as new technologies allow current procedures to be automated to shorten the time required to perform tasks. The adoption of these technologies makes it possible to automate and optimize the collection of information and improve through data processing and analysis, facilitating the expansion of the scope of activity through a good identification of gaps. Also, artificial intelligence significantly eases human time and effort by eliminating manual and repetitive tasks, allowing staff to focus on analyzing the flow of accounting data, recognizing patterns of behavior in different sectors of activity, and discovering irregularities or anomalies. Today, audit quality has become the most controversial error in financial reporting. Some studies have shown that improving audit quality lies in applying artificial intelligence to audit exercises. The research is based on a review of important public and academic literature. It focuses on audit systems in public organizations, particularly in the light of growing digitalization and the integration of artificial intelligence.*

Keywords: *Industry 4.0; Artificial intelligence; accounting; control, audit,*

JEL classification: M41, *M49, M21, L78*

Introduction

Today, artificial intelligence, with the development of technology, is found in all areas, making people's lives easier by reducing repetitive and difficult work. Somalvico (1987) defines artificial intelligence as "that discipline, belonging to computer science, studies the theoretical, methodological foundations and techniques that allow the design of software and hardware systems capable of providing the computer with the performance it needs". The new discipline does not aim to simulate human intelligence, but the main objective is to "copy" human intelligence for positive purposes. „After decades of frustration with long “AI Winters,” various business industries are witnessing the arrival of AI’s “Spring,” with its massive and compelling benefits. Auditing will also evolve with the application of AI” (Issa, H.,et al 2016)

Artificial intelligence is a broad space that is best described as “that activity devoted to making machines intelligent, and intelligence is that quality that enables an entity to function appropriately and with foresight in its environment” (Nilsson, 2009). AI software helps business take decisions. In accounting and auditing, AI can facilitate decisions that are related to financial data. (Watch, 2021)

Javaid et al. (2022), considered these innovations enable democratization of data, larger-scale insights, and integration of Industry 4.0 and its software. The Industry 4.0 vision connects devices

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and connects them beyond the walls of the manufacturing plant. Data has become a modern tool for many companies.

In the last two decades, artificial intelligence has rapidly penetrated many fields of activity, therefore it cannot be called a single technology but has become a family of technologies (AbuOdeh et al., 2021)

"Technologies such as artificial intelligence (AI), the Internet of Things" (IoT), big data, machine learning (ML), and other advanced technologies are being used to implement Industry 4.0 (Javaid et al., 2022)

Artificial intelligence will have a disruptive impact on the global economic system, on companies, increasing the reduction of the workforce for low-skilled workers, who carry out activities such as cargo handling, equipment operation and maintenance, typing, logistics, transport, etc. Thus, physical and manual skills (e.g. equipment repair, mechanical, craft and technical skills, inspection and monitoring skills, etc.) have the highest degree of automation, internet explorer (Lemley et al, 2017) the category within which the working time of human capital will be considerably reduced, following their basic cognitive skills. Even in terms of superior cognitive skills, it will be possible to reduce the working time of employees when we talk about advanced communications, but with the possibility of automation, and statistics. On the other hand, critical thinking, decision making, interpretation of complex information and creativity will remain, at least for the moment, specific to the human being, therefore irreplaceable.

Companies providing audit services are in no hurry to embrace AI, despite the fact that the sector values partial automation, given that there is a high intensity for routine work.

The introduction of intelligent systems in the audit area will affect current audit procedures, which are a direct consequence of available technologies.

Information technology, now referred to as Industry 4.0, offers great potential in the field of accounting. Many of the tasks performed by accountants will be automated. Accountants are being replaced by robots in their routine tasks, creating more space for other accounting tasks, such as data analysis. As the role of accountants will continue to be crucial for organizations, despite the expected changes in their roles in the workplace, Hoffman suggests that accountants enrich their creativity and sense of improvisation to replace themselves with the process of creating organizational value. (Hoffman, 2017)

Literature review - Artificial intelligence in audit

The origin of the word "audit" is found in the Latin term "audire", which means "to listen" (Rasinski et al., 2011). During the Middle Ages, auditors, on behalf of landowners, had the responsibility to listen to and verify the fairness and accuracy of workers.

With the advent of the computer, methods of analysis in the field of audit have changed significantly. For example, paper, the ubiquitous physical document in offices in the twentieth and early twenty-first centuries, is now in rapid decline, being promptly replaced by virtual documents, included in electronic archives and available at any time of day or night. In the past, for example, there were the same mandatory working documents in physical format, on paper, while today audit documentation can be processed in a sector of activity, easier, faster in electronic format, due to technological evolution. "There is an expectation that the introduction of artificial intelligence (AI) will bring about profound changes in the current paradigm of the audit profession, ensuring better reliability and security in the analysis of financial statements" (Rodrigues, L.,et al., 2023)

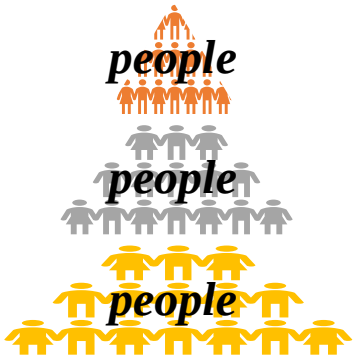
Generally, the data used by the auditor is mostly quantitative, and large companies require the auditor to include "Big Data" containing unstructured and semi-structured data, additional audit evidence and detailed information that helps the auditor to have an objective opinion on the activity of the audited company.

The COVID pandemic forced the adoption of remote work, allowing audit team members to review and collaborate more effectively from home in drafting documents for audited companies. The rapid technological advance and its implementation in the audit sector have facilitated the transfer of work to the online environment. Another change brought by artificial intelligence in auditing is the possibility of performing analyzes that the auditor interprets quickly, without having to spend many hours to get an overview of his activity. Another advantage lies in the auditor's ability to be proactive and efficient in managing his simultaneous activity in several firms or companies.

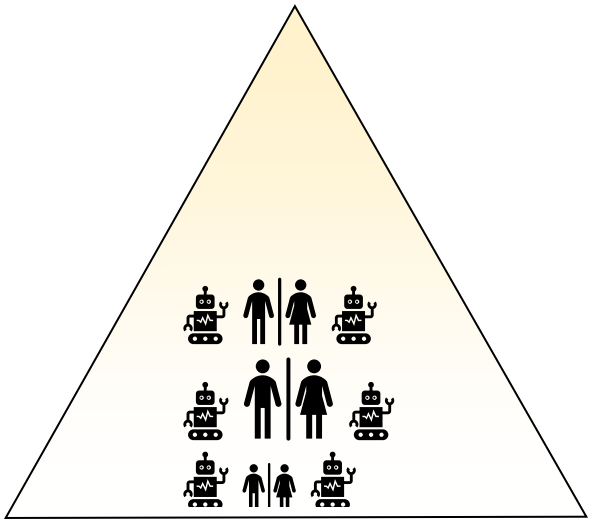
Application of RPA software in legal audit

The application of Robotic Process Automation software allows to perform auditor association between control tasks or analyzes on several software systems not authenticated to the same source. The auditor with the help of RPA can perform the automatic reconciliation activity, accessing FTP (protocol file transfer) set by the examiner and client, entering the query to search the list of income more easily, expenses, trial balance, even a comparison between the total revenues from the reported list with those from the trial balance. The benefits of this software in auditing are to improve the quality as well as increase the effectiveness of the auditor's work process. This ERP helps the auditor's activity to check items with high potential for anomalies, money laundering, fraud, erroneous records. (Kittur et al., 2022, p.25)

The introduction and implementation of intelligent systems in companies automatically changes the audit interface which in turn involves changes in the structure of the company's organizational chart. In figure 1, we can see that the human factor is replaced by automated systems.



A.



B.

FIGURE 1 – how is replaced human in the wor
Own source

Section A presents the organizational structure of an audit firm where employees with a medium level of qualification are found at the bottom of the pyramid, and those with a high qualification are at the top of the pyramid.

In section B, we wanted to highlight the abstraction of the effect of automation on the organizational structure of audit firms. Thus, medium-skilled jobs, mundane, repetitive tasks and mid-level decision-making activities are taken over by the software robot, and the result is that the

organizational hierarchy has practically the same pyramid shape (as in section A), but under a different form of organization, since the human factor resembles a pillar rather than a pyramid.
In the future, the implementation of intelligent systems will lead to changes in the field of statutory auditors and the need for internal restructuring of audit firms, as well as a need for new economic charts. (Milan, A & Indermun, S. 2023;). Thus, auditors will need to have both economic and IT skills. It will be essential for auditors to know and use some technological tools such as Excel, Business Intelligence tools: Power BI.

Today, auditors have long embarked on a path of digitalization, and this has been accentuated due to the COVID pandemic. Some companies use Artificial Intelligence software called "ERA" ("Effective Revolutionary Auditing"), the technology tool that manages to perform and be helpful to auditors. (Duan et al., 2007) Thus, with this software most operational tasks are performed by it, and the auditor, the qualified person, remains only to carry out the evaluation and the final phases of the audit process, that is, the objective opinion.

Advantages and disadvantages of implementing AI in auditing

In terms of artificial intelligence, globally, 30% of companies have adopted intelligent systems to ease work and reduce repetitive maneuvers. (Daugherty & Wilson, 2018)

There are few companies that have implemented the artificial intelligence tool ERA ("Effective Revolutionary Audit"), they benefit from performing the fully digitized audit process without the need to use physical documents. It can be considered that it is, in fact, a technology that manages to perform, fully automatically, most of the operating functions included in the review process, leaving for human intervention the responsibility of the evaluation and the final phases of the audit process (Mihai et. al., 2018).
The benefits of AI in auditing enable accurate and targeted reviews tailored to the client's needs. (Eysenck, G & Khan M; 2019). The application of intelligent internal audit platform based on machine learning can not only effectively solve the problems of slow speed and error prone when traditional audit technology processes massive social security data, but also help the audit team determine the audit focus, explore audit doubts, and improve the utilization of audit data resources (Zhang, 2023; Zhao, Y., 2016)
The intelligent system executes the audit process using streamlined, technologically advanced reports, gives audit teams the opportunity to work simultaneously on the same mission, and the audit tool acts remotely thus, optimizing results promptly, finding solutions for significant errors that occurred during checks. (Zhang et al., 2009) Artificial intelligence brings significant benefits to the company, including reducing the time required for audit activities, increasing data reliability and decreasing human error. The intelligent system improves the atmosphere in the organization, has a positive effect on the quality and well-being of employees, facilitates the reduction of the working week to 4 days and raises productivity. (Kozhakhmet, K 2012a & 2012b)

In parallel with the advantages, there are also disadvantages: sometimes the audit fails to correctly identify certain financial statements and adequately apply audit procedures using technological solutions. Also, errors may occur in the configuration of the software algorithm, having an impact on the checks performed by the auditor at the end. Going forward, there are concerns about increased cyberattacks, IT disaster risks, and GDPR violations that could target audit companies to access customer data, “see the New York Times lawsuit against Microsoft's Open Ai”.
“With technology advancing at a geometric pace, robotics, artificial intelligence, 3D-printing, and other innovations with enormous disruptive potential will soon hit the mainstream. Technological unemployment is undoubtedly an impending problem that will create greater inequalities and an increasing gap between the returns to labor and the returns to capital.” (Peters, 2019, pp. 99-107).

Currently, AI is not yet able to cope with certain unforeseen circumstances or exceptions provided for in the current legislation as part of the audit. (Lakshmana K; 2021)

Another disadvantage arises in maintaining the communication relationship between the audit firm and the client, which is crucial. For example, with the outsourcing and implementation of various technological tools within the company, direct contact between the firm and the customer is significantly reduced. In the long run, this situation could lead to the termination of the collaboration. Notwithstanding the above advantages, inspectors should use professional judgment while maintaining professional skepticism. (Albitar, K., Alqahtani, F; 2019) The benefit of skepticism is to ensure that the auditor has the information before being accepted as an honest representative of a company's financial health (Raschke et al. 2018).

Data security in auditing used AI

Is AI becoming a must have? Artificial intelligence as a support in digital verification proves to be an indispensable tool and revolutionizes the entire audit process. In the business world, in order to remain competitive and cope with increasing the efficiency of work processes at another level, entrepreneurs, executives, turn to artificial intelligence to diminish their work. (Zhang, 2023)
„The present era of "big data analytics and management "requires a robust and impenetrable system to deal with the issues of data integrity and security. If data is altered or deleted without sufficient audit trails, a corporation loses its most valuable asset." (Priya, V.,et al 2023)

Thus, audit data security used by AI refers to automating intelligent behavior to independently solving tasks and problems. The machine learning aspect is crucial: AI can analyze structured and unstructured data, recognize schemas, and based on this, constantly learn and develop. In deep learning, artificial neural networks are created that are structured like a brain and exchange information through nodes. As a result, AI leads to automated decision-making processes that were previously reserved for human intelligence.

Some people associate AI with fear that technology could take over more and more human jobs (Schuett, 2023). In the area of IT security, where growing challenges meet with notorious staff shortages, this is precisely where a great opportunity lies: to avoid malware, attacks on mobile devices or phishing attacks directed at individual individuals and departments, technology can make it easier for employees and help with IT. Support protection. In particular, machine learning (ML) methods, a branch of artificial intelligence, can help develop secure IT systems that learn to adapt to threats. When large amounts of data need to be analyzed and anomalies detected, ML methods are generally suitable. Of course, this requires a lot of effort to train the systems.
In other news, not only are IT professionals using artificial intelligence (AI) to protect themselves against information theft, but attackers are optimizing their tactics with this AI. (Leyendecker, L & Li, Y;2023). In the field of auditing, problems may arise such as:

- Reproduction of deep learning
- Vulnerability detection and correction
- Biometric verification of auditors
- Sending personalized emails for phishing and information theft
- The possibility of "bad" AI bypassing countermeasures implemented by "good" AI against security attacks

Also, companies that do not adopt Artificial Intelligence (AI) could become vulnerable to attacks as attackers use AI to access relevant information. (Schuett, 2023) To effectively counter these cyber threats, organizations need tools that facilitate the collection and analysis of data from compromised and uncompromised endpoints. This information is essential for security analysts as they can detect anomalies and develop proactive defense strategies. (Upadhyay, K. & Wu, C; 2022)

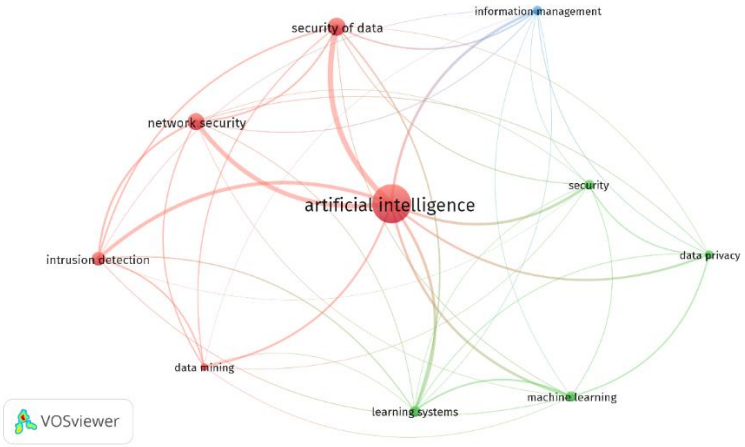


Figure 2 – Vosviewer
Own source

With the help of VOS Viewer -figure 2, we conducted a bibliometric analysis to highlight the central role of artificial intelligence in the links created in this field. We have observed that data, network security and intrusions appear as areas for collecting information from various sources. This allows the system to quickly identify new threats launched by hackers, helping to detect malware systems before they cause significant damage. This frees companies time to fix security vulnerabilities and develop prevention strategies.

Data mining, learning systems, and machine learning are processes by which artificial intelligence (AI) processes a huge amount of data. One of the biggest advantages of AI is its ability to process a huge amount of data in an extremely short time. In addition, the creation of algorithms can be automated to detect security threats, facilitating rapid response to them.

Conclusions

The introduction of artificial intelligence into audit processes brings considerable benefits, revolutionizing the way financial data is managed and analyzed. The implementation of AI technologies brings increased efficiency, reducing the time required to interpret complex information. This facilitates the rapid detection of anomalies and errors, helping to manage security risks and protect sensitive data.

"Audit procedures are a direct consequence of available technologies" (Issa et. all,2016,1-20). Another strength of AI in auditing is its ability to process a huge volume of data in an extremely short time. Data mining, learning systems, and machine learning are just some of the ways AI processes information efficiently and accurately. However, there are also challenges. AI systems may find it difficult to identify unforeseen circumstances or exceptions under applicable law. (Gupta 2015 & 2023)

In addition, the adoption of AI can lead to changes in the relationship between audit firms and clients, reducing direct contact and putting pressure on how to communicate. Cyber threats are a major concern in this area, with the potential to compromise the confidentiality, integrity and availability of data. Thus, the implementation of adequate security measures becomes imperative. Data encryption, strong authentication, continuous monitoring, and frequent system updates are just some of the essential strategies to protect data.

Overall, artificial intelligence in audit processes is redefining how financial information analysis and interpretation activities are carried out. With enormous potential to increase the efficiency and

accuracy of audits, AI is an integral part of the continuous development and innovation of this critical area in today's business environment. (Wang, S, 2021)

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