

Application of Artificial Intelligence in Accounting and Auditing

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ABSTRACT

With the entry of artificial intelligence into the field of accounting, this knowledge has undergone a significant change. The use of artificial intelligence makes errors and calculation mistakes in accounting close to zero, because artificial intelligence technologies rely on code and programming that is so precise and small that the error in it is likely to be very small. The speed of development of artificial intelligence is so high that it cannot compete with humans and it is able to do tasks and process data that humans are not able to do. The speed of calculations of machines that use artificial intelligence is very high. Artificial intelligence systems process data at lightning speed, a task that is difficult and time-consuming for humans to do. Artificial intelligence will help improve the performance of accountants and auditors in performing accounting and auditing tasks. In general, it can be said that accountants who do not resist the emergence of artificial intelligence and the changes and developments created by this medium, and show more flexibility, will have a much brighter future than other accountants.

Keywords: Artificial Intelligence, Accounting, Auditing.

I. INTRODUCTION

Efforts to improve AI concepts over the past 20 years have led to truly unique innovations that are the basis of a true technological breakthrough. Since the invention of computers or machines, their ability to perform various tasks has

increased exponentially. Humans have developed the power of computer systems in their diverse fields of work, increasing speed and shrinking in size over time. Big data, medical research, and autonomous vehicles are just some of the incredible applications emerging in the development of artificial intelligence. Today, artificial intelligence has advanced in almost every field - from science to business. Artificial Intelligence is found everywhere. For example, the front page of your favorite newspaper is on your smartphone, in your pocket, on your desk, in your car, etc. With the help of artificial intelligence, we can create software or devices that solve real-world problems easily and accurately, such as health issues, marketing, traffic problems, etc. (Tatomir and Kvasni, 2021).

Artificial intelligence, due to its application in the auditing of financial statements, has had a significant impact on the audit objectives and the ways to achieve them. In the past, despite the technologies available at that time in the accounting profession, the objectives of auditing financial statements were limited to compliance with generally accepted accounting principles, through accounting audit as the only method. With the advent of artificial intelligence technologies, the objectives of auditing financial statements should be to confirm the reliability of accounting information rather than the compliance of accounting reports with the basic principles of reporting standards. When trying to achieve these audit objectives, auditors should adopt more independent confirmation methods than limiting

themselves to the scope of the accounting audit. Audit statements should be derived from the objectives and decisions of the audit. Audit evidence should come from more comprehensive and independent paths, such as expert conclusions. In fact, the development and application of artificial intelligence technologies are transforming traditional life and work patterns, which has led to significant changes in the social environment. All disciplines and professions are restructuring or improving their strategies, organizations, products, and procedures to better adapt to today's rapidly growing information and awareness society. The field of auditing is no exception to this rule. So that it can now use electronic accounting, data mining and multi-dimensional data analysis. However, audit technologies and procedures are only a subset of the changes brought about by artificial intelligence. This technology can have a significant impact on audit objectives, especially on auditors' objectives when using financial statements and audit methods (Nazarpour et al., 2019). In this article, an attempt has been made to discuss the use of artificial intelligence in accounting and auditing.

Advantages of using artificial intelligence

Artificial intelligence can receive and analyze information faster than us. On the other hand, AI never makes emotional decisions. We still do not understand the nature of emotion very well. As a result, we still don't have the ability to teach computers not to be emotional, we have to spend a lot of time to study the documents and information of a company. While this process takes only a few seconds for a computer. While studying and analyzing them, we should eat tea, water and food, talk with others. All this distracts us and reduces our concentration. Artificial intelligence does not have any of these problems (Tatomir and Kwaseni, 2021).

Applications of Artificial Intelligence

Next, various applications of artificial intelligence branches in several management fields such as marketing, finance, production, as well as strategic planning and organizational and financial forecasts are discussed, which are discussed below:

Application of artificial intelligence (expert systems branch) in marketing management: The potential advantages and widespread use of expert systems have enabled them to assist managers in the field of marketing and management. Marketing strategic planning is a complex task that requires many judgments and opinions. Expert systems by collecting the

knowledge of experts in their knowledge base, which is the basis of the conclusions of its inference engine, will have a significant impact in this field, but the development and construction of this expert system is very difficult. The goal of the expert system is to provide a structured marketing planning process, guide the user through this process, provide useful suggestions to experts at key stages, and ultimately provide suggestions to users in choosing marketing goals and strategies (Zarghami, 2015).

The use of artificial intelligence in decision support systems through knowledge management: Another very important topic of organizations today is knowledge management. Knowledge management has recently received a lot of attention in computer information systems, and governments, industries, and companies show great interest in it. Decision support systems and knowledge management are closely intertwined. Decision makers make decisions based on different types of knowledge available in the organization. Artificial intelligence as a source of knowledge that helps to make optimal decisions makes the role of expert systems more prominent in this field.

Application of expert systems in production and operations management: In recent years, with the increasing complexity of manufacturing industries and the need for greater efficiency, shorter product life cycles, higher flexibility, higher product quality, customer satisfaction and meeting their expectations, and lower costs, the face of production operations has changed. The main challenge for organizations at this time is how to adapt to these changes in the business environment. So that competitive advantage can be achieved through the chosen path. Another important part of production and operation management in the organization is the task of inventory control and material storage. A key task in the material control system is the selection of equipment that is responsible for handling and storing materials. Except for checklists, there are limited tools available to managers to help them choose these equipments. The expert system is introduced as an intelligent control system for the selection of material control equipment, which can be very useful.

Application of genetic algorithms in transportation management: One of the basic goals in the field of transportation management is the optimal utilization of the country's transportation capacity. For example, the problem of train movement scheduling is considered one of the most difficult scheduling problems in transportation

systems, and with the increase in travel demand and the development of railway lines, the importance of the problem of scheduling and dispatch sequence has doubled. The main goals in transportation management are to minimize the travel time from origin to destination, reduce all operating costs, fuel, personnel, etc., satisfy passengers and goods owners by minimizing delays and maximizing the use of transportation and crew capacities. The increasing share of transportation in the economies of countries, as well as the increasing speed of computers and the use of software, have led researchers to present new methods for solving problems every day and, by using metaheuristic algorithms such as genetics, help planners quickly create efficient scheduling programs to reduce transportation costs (Zarghami, 2015).

Applications of Artificial Intelligence in Accounting and Auditing

In addition to its application in various fields, artificial intelligence has also found its place in accounting and auditing, where artificial intelligence is the creation of practical software and equipment and imitates many human behaviors such as reasoning, learning, and problem solving. Nowadays, a lot of use of information technology in the way of information processing, continuous changes, has faced auditors with new challenges and added importance to the evaluation of the validity of accounting information systems. And as the accounting and auditing environment becomes more complex and a tool is needed in this environment to help in decision making. In the artificial intelligence model, all existing relationships between variables, many of which have not been discovered, but some have been discovered and proven, are considered. And the theory of phase sets and phase logic can help auditors in the possible management of audit risk and in the field of uncertainty measurement in the audit environment (Parhizkar et al., 2015). In the following, the application of artificial intelligence in accounting and auditing will be discussed.

Fraud Detection

Since the major accounting scandals of the early 2000s and the passage of the Sarbanes Oxley Act in 2003, all financial auditing has focused on ensuring that companies' financial statements are financially sound and free from fraud. Many steps have been taken to set standards and pass laws that try to eliminate the ability to encourage fraud, and technology is helping auditors better detect fraud.

In the field of machine learning, experts have been developing algorithms and regressions for years to find ways to determine fraud, and in 2000, Timothy Bell of the University of North Florida and Joseph Carchello of the University of Tennessee Knoxville actually developed a regression to estimate the probability of fraud for an audit client based on several fraud risk factors. Similar research has been going on for almost two decades. In 2011, Johan Perols from the University of San Diego compared six models, which were one of the most common learning machines used for fraud detection, in his research, and six of the 42 predictors that are always selected by the programs were accepted (Tatomir and Kwasny, 2021).

Document review

One of the long and expensive parts is extracting documents, because a lot of time must be wasted by examining the contents in detail. Using artificial intelligence, this process is automated, the system is taught how to review documents and then identify and extract important parts. Deloitte experienced this challenge across all of its other service lines, describing the process as "tedious and time-consuming." To solve this problem and speed up the document review process, Deloitte (a multinational professional services network, recognized as one of the four largest auditing firms in the world) used a software to automatically evaluate documents called Natural Language Processing (NLP). By reading documents in electronic form and identifying relevant information and important parts and extracting it from existing documents, the document review process has been speeded up. Also, this technology has been able to improve its accuracy. These technologies also eliminate sampling, the program is able to scan entire documents in minutes.

Stock price prediction

Today, investing in the stock market is an important part of the country's economy. For this reason, stock price forecasting is of particular importance for shareholders so that they can get the highest return from their investment. On the other hand, the stock price index shows the general state of the stock market and can help predict the investment direction of the shareholders. In previous years, classical methods were often used to predict stock prices, but with the continuous progress and development of meta-heuristic methods and neural networks, they have found increasing applications in predicting stock price indices. The stock market is actually a non-linear

and chaotic system that depends on political, economic and psychological factors. Therefore, it is very difficult to apply traditional analysis tools to make accurate stock decisions. Researchers found that using a combination of classical forecasting methods and artificial intelligence, weighted or simple averages, greatly reduces the amount of forecasting error compared to other methods (Zarghami, 2015).

The prediction of stock price or stock return is influenced by various factors. Factors such as price changes, volume of transactions, profit per share, number of common shareholders, quality of premium shares, etc. are among the effective factors in determining the stock price trend. By using artificial neural networks, you can use non-linear processes and design an optimal model that displays the best response after applying all the variables.

Farzpourmachiani M. and Farzpourmachiani A. (2024) introduce "Attrition Entrepreneurship": income-generating activities failing to build societal wealth, potentially harming the economy. They suggest government or societal factors can foster this, citing war industries, inheritance tax, and discrimination. This contrasts with genuine entrepreneurship driving innovation, as attrition entrepreneurship just recycles resources. While IP isn't mentioned, attrition entrepreneurship likely neglects it. True innovation needs IP rights, but attrition often prioritizes short-term gains via imitation, not novel IP.

A weak IP framework can inadvertently encourage attrition entrepreneurship, hindering true innovation and long-term growth (Farzpourmachiani M., Farzpourmachiani A., 2024).

Application of genetic algorithm in bankruptcy prediction

Bankruptcy is a very important global problem with high social costs. Therefore, its prediction is very important. To solve the bankruptcy problem, researchers have extracted a set of rules or conditions using genetic algorithm. Based on these conditions, the model will predict whether a company faces the possibility of bankruptcy or not. Genetic programming can minimize the number of variables that have been identified as important in bankruptcy prediction using traditional models and statistical selection methods. For example, in a study he conducted, Lansberg used genetic programming for 28 potential bankruptcy variables that were identified

as important in previous research. As a result, 6 important variables were identified (Waqifi, 2019).

Credit prediction

With the help of artificial neural systems, input data related to customer information can be presented to the system and the output response can be analyzed for credit decisions. The most important advantage of these systems compared to other linear models is that it is able to use financial data sets without the need for assumptions such as linearity and normality.

Cost estimate

In the estimation of the cost price, several factors such as changes caused by the rate of materials and direct wages, changes in the value of the currency unit, and changes in the nature of technology have an effect. Therefore, considering that the input information is large and sometimes incomplete, artificial intelligence is able to consider the most suitable option for estimating the total price.

Benefits of using artificial intelligence in accounting

With the introduction of artificial intelligence in the field of accounting, this knowledge faced a significant change and evolution. The use of artificial intelligence makes errors and calculation mistakes in accounting close to zero, because artificial intelligence technologies rely on code and programming that is so precise and small that the error in it is likely to be very small. The speed of development of artificial intelligence is so high that it cannot compete with humans and it is able to do tasks and process data that humans are not able to do. The computing speed of machines that use artificial intelligence is very high. AI systems process data at lightning speed, which is difficult and time-consuming for humans to do.

Artificial intelligence will help improve the performance of accountants in doing accounting work. In general, it can be said that accountants who do not resist the emergence of artificial intelligence and the changes and developments created by this medium, and show more flexibility, will have a much brighter future than other accountants (Tatomir and Kwasi, 2021). It is likely that in the future, all of the following tasks and activities will be performed by artificial intelligence.

Tracking financial trends over long periods of time

The time required to determine financial strategies depends on the time allocated for data collection. The faster the information needed to determine the strategy is gathered, the faster things will be done.

Artificial intelligence can collect this information in the best way and in the shortest time possible from several different sources. With the help of this precise and efficient information, artificial intelligence will quickly determine the process of doing your work.

Better cost management

Aligning expenses with business and company policies is an important but time-consuming process. Artificial intelligence is very capable in speeding up work and can evaluate costs in the shortest possible time and at the end identify defects and report cases of non-conformity (Sadiqian et al., 2019).

Providing information security

By recording and storing information electronically, you can ensure the security of your data. Also, if you need to access a data, you can quickly extract and analyze it.

Thanks to artificial intelligence, you no longer need to spend hours searching and extracting stored data and information. In fact, artificial intelligence increases the accuracy, security and speed of your work.

The ability to track various accounts receivable and payable

Among the notable capabilities and features of artificial intelligence is the existence of the invoice management and control process. Controlling all financial transactions and tracking accounts receivable and payable are among the things that are easily managed with the help of artificial intelligence.

Answering users' questions by artificial intelligence

The possibility of answering the common questions of users by artificial intelligence can be considered as another application of this technology. For example, with the help of this technology, you can get a suitable answer for questions such as the time of bill approval, the last balance of the account and the status of the accounts (Sadiqian et al., 2019).

The impact of artificial intelligence in identifying audit guidelines

After determining the audit objectives, the basic question arises as to how to achieve them. To do this, first, by identifying audit guidelines, audit evidence must be collected and evaluated, then auditors must make audit judgments, reach audit opinions, and achieve audit objectives. More detailed audit instructions focus on the audit objectives in more detail and form a prerequisite and basis for gathering audit evidence. According to auditing theories, the gathering of audit evidence should begin with the identification of audit guidelines. With the limitations of audit technologies, assurance of accounting information is usually done manually, which is highly dependent on the inspection of accounting records and forces auditors to select a completely realistic combination to infer specific audit objectives based on accounting assertions. Identifying audit guidelines also depends on the accounting information statements made by the entity's management. In 1980, the American Institute of Certified Public Accountants (AICPA) issued a revised Statement of Auditing Standards No. 31, "Subject Matters of Evidence," which sets out five assertions as representations by management: existence or occurrence, completeness, rights and obligations, valuation or allocation, presentation, and disclosure. These five assertions are explicit representations of knowing, measuring and reporting about accounting information. In particular, it states the existence or occurrence, completeness, rights and obligations of requirements related to verification of accounting information. Valuation or allocation deals with the measurement requirements of accounting information. Then the presentation and disclosure address the reporting requirements of accounting information.

The guidelines are identified according to the audit objective, from which the overall audit objective is derived. It may then be broken down into specific audit objectives, which in turn result in audit guidelines, ensuring a rigid logic between audit objectives and audit guidelines. On the other hand, the classification of audit instructions can be further expanded. In addition to additional audit instructions identified from accounting statements during the audit phase, auditors can also identify instructions related to audit objectives. For example, to ensure and achieve the objective of gathering valid and reliable accounting information, audit guidelines that should be identified include: (1) the overall appropriateness

of accounting information; (2) the suitability of all specific accounting information; (3) the suitability of financial indicators; (4) the suitability of financial indicators in the perspective of the historical development trend of the company. (5) the suitability of the structure of all financial data, etc.

With the support of strong analysis function through big data search, AI can not only meet the complete requirements of the audit guideline set, but also realize the close convergence between the audit. The guideline system and the audit objective system lead the audit procedures to be very close to the final audit objective of the accuracy of accounting information. AI improves the existence of audit judgment independence in the audit procedure. Researchers argued that for data-driven auditing, the audited object is electronic data on the books, meaning that with available information technologies, auditors can generate and use economic information from their own independent system rather than the accounting information system (Tatomir and Kvasny, 2021).

Applying AI to Internal Auditing

The application of AI to internal auditing can help to realize continuous accounting. It is critical that internal auditors consider the practical applications of AI in business and develop practices that enable the internal audit profession to provide AI-enabled advisory and assurance services.

AI is dependent on big data and algorithms to analyze that data, so it can seem intimidating and out of reach for internal audit activities and organizations that are not yet big data savvy. But internal auditors don't need to be data scientists or professional data analysts to understand what AI can do for them.

An example of how artificial intelligence can be applied to auditing is in contract review. Machine learning tools allow computers to analyze a greater number of contracts, such as leases, in a much shorter time frame than traditional manual review. In a recent example, AI tools were able to accurately extract information from lease agreements using pre-selected criteria (Parhizkar et al., 2016).

By enabling auditors to work better and smarter, AI helps them optimize their time, allowing them to use their human judgment to analyze broader and deeper sets of information (Parhizkar et al., 2016).

It also allows auditors to ask better questions and engage more with financial

managers, audit committees, and the board of directors, adding more value to the audit process. In this way, AI can play a role in delivering better quality audits and an exciting future for auditors.

AI is powered by algorithms, and algorithms are powered by big data, so before an organization can deploy AI, it must provide the data it needs. Also, before internal audit can think about addressing AI, it must assess the readiness and availability of big data.

Big data means more than just a large amount of data. Big data refers to data that has high variety, speed and variability. Such as transactions generated daily in the stock market or payment transactions in banks and payment networks.

For proper use of big data, organizations develop algorithms. Algorithms are a set of rules that a computer must follow. An algorithm is what enables a computer to quickly process large amounts of data that humans cannot process naturally.

The performance and accuracy of algorithms is very important. Algorithms are originally created by humans, so human error and intentional or unintentional biases affect algorithm performance. Faulty algorithms can cause minor, undesirable glitches in an organization's operations or catastrophic results.

AI presents both risks and opportunities for internal auditors. On the one hand, auditors must ensure that their business uses this technology appropriately, and on the other hand, auditors can use artificial intelligence systems to carry out their missions.

Reduction of manual labor

One of the main capabilities of artificial intelligence is reducing the burden of laborious manual processes. For example, auditors traditionally had to review transactions manually to identify discrepancies. The time and resources required to cover even a few hundred documents are considerable. But AI can significantly reduce this work. For example, KPMG has partnered with IBM's Watson platform—which can read 800 million pages per second—to enhance its tax and advisory services. Organizations can train AI systems to spot signs of fraud and other problems, a trained machine can handle manual work in a very large volume in a very short amount of time.

More comprehensive audits

The ability to evaluate vast data sets at high speed enables internal auditors to do their work more accurately. The process of predicting

risk becomes much more accurate as the amount of data analyzed increases. Machine learning helps AI systems continue to evolve, but humans still need to train computers to recognize their mistakes. While auditors' manual workload may be reduced, they still need to spend a lot of time developing AI models and training them.

Providing strategic insights at the board level

AI can lead to significant insights into corporate risk and governance, and internal auditors can be at the forefront of providing strategic recommendations to the board. In this process, auditors move from a purely assurance-based role to one that is a primary advisor to the company's growth. (Which means that the role of internal auditors becomes more prominent and in addition to assurance and audit services, they can have a consulting role for the company and guide the company in the direction of growth and development) A more prominent role for internal auditors means more opportunities for their career advancement.

Attracting top talent

Organizations that give auditors the opportunity to work with advanced AI technologies have a better chance of attracting industry-leading professionals. Reducing the burden of manual processes and providing strategic tasks will attract more motivated forces to the internal audit unit (Parhizkar et al., 2016).

II. CONCLUSION

This article examined the application of artificial intelligence in accounting and auditing. Efforts to improve AI concepts over the past 20 years have led to truly unique innovations that are the basis of a true technological breakthrough. Since the invention of computers or machines, their ability to perform different tasks has increased exponentially. Humans have developed the power of computer systems in their diverse fields of work, increasing speed and shrinking in size over time. Big data, medical research, and autonomous vehicles are just some of the incredible applications emerging in the development of artificial intelligence. Today, artificial intelligence has advanced in almost every field - from science to business. AI can receive and analyze information faster than we can. On the other hand, AI never makes emotional decisions. We still do not understand the nature of emotion very well. As a result, we do not yet have the ability to teach computers not to be emotional. We have to spend a

lot of time studying a company's documents and information. While this process takes only a few seconds for a computer. While studying and analyzing them, we should eat tea, water and food, talk with others. All of this distracts us and reduces our concentration. AI has none of these problems. It can be said that artificial intelligence will help to improve the performance of accountants and auditors in performing accounting and auditing work. In general, it can be said that accountants who do not resist the emergence of artificial intelligence and the changes and developments created by this medium, and show more flexibility, will have a much brighter future than other accountants.

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