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The Future of the Accounting Profession Under the Incidence of Automation

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Development of technology in the field of accounting area has generated big impacts on accounting departments and has led to a radical change in the way accountants should work in business environment. The automation of accounting processes is seen as a current major trend, having in its composition both positive and negative effects, which aim to highlight benefits, as well as threats that will face the future accounting profession. By nature, the accounting field has been directly influenced by the evolution of information technologies, currently advancing towards robotics automation, Machine Learning, Artificial Intelligence, Data Analytics, cloud data storage and many more. The purpose of the article is to present the applicability of emerging technologies that shape the accounting profession, the methods, working tools, as well as the as the balance of advantages and disadvantages of such technologies. Regarding the automated peculiarities, the study within this document is focused on the accounting systems applied by Romania, USA and Korea. These being three countries with different levels of development, reasoning, the way they act and deal with existing problems. The focus of this presentation is to shows the future of the accounting profession, as well as the accountants who will have to develop new skills and knowledge in order to cope with change. Technological transformation is expected to overflow, especially after COVID-19, and it is therefore necessary to understand and explore new technologies that offer many opportunities associated with risks and threats.

Key words: automatization of accounting processes, robotics, technologies, the future of the accounting profession, threats, artificial intelligence.

1. Introduction

Automatization field is wide and dynamic, more and more accentuated in recent years. As the business world tends to take over the market and the Internet grows, information waves has become extremely fluid and we are watching a rapid process of digitization of the entire society. The digital era comes with a number of major changes in the labor market, such as jobs where people are no longer needed, they are replaced for certain processes with machines but also the new trades, which will require the development of new digital skills. Robots have been used in many industries and processes of production since 1970. Subsequently, robots began to be used in various sectors, such as tourism and financial services, and more recently accounting. This influence of informatics has experienced a continuous evolution, compared to which most large companies have chosen to follow the technological trend in order to stay in the game and to ensure transparency in the professional fields of accounting. Because many accounting and auditing activities are repetitive, there are tasks which interact with multiple systems, has high levels of processes, and require haste decisions, the potential for using Process Automation software in these areas is wide. The specialized literature presents RPA as a software integrated in the existing IT infrastructure of a company, which can be programmed to perform repetitive tasks, thus making people to lose their jobs, in sectors such

as invoice processing or transactions, filling different types of documents / forms, online or offline worksheets, preparation of reports, preparation / updating of databases, verification or validation of data, data reconciliation.

In the context of digital age and particularizing the case of intensive digitization of the accounting profession, the paperwork aims the RPA subject , along with most new software, the challenges, its threats to the accounting profession, which becomes increasingly debated internationally, but also nationally by both workers in the field and academia.

The study conducted through an analysis of the scientific literature, aims to make major contributions to the development of knowledge, highlighting the particularities applied in the accounting systems of Romania, USA and Korea.

First, the patterns of RPA implementation in accounting will be identified and then the entire automatization process will go hand in hand with possible future developments, opportunities and threats. At the same time, the perspective of future accountants will be discussed, as valuable advisors to the organizations they work for. They must be up to date with a wide range of technologies and trends.

Accountants have always exploited emerging technologies to help them perform their tasks more accurately, quickly, or simply: from Sumerian scribes' clay tablets, to 19th-century computing machines, to 20th-century computers. They have been simple compared to the thousands of technologies that are currently reshaping the fields of accounting and business. Therefore, finance professionals need to consider the challenges posed by new technologies and use their analytical and problem-solving skills to assess their potential influence, provide the necessary information and to guide them. To establish vision and direction, as well as tactical and strategic business decisions.

The purpose of this research is toA analyse the extent which the technological environment in the 3 countries studied manages to train sustainable accountants for future accountants, in order to respond effectively to challenges from the business environment.

The proposed study is organized in 3 sections, as follows: in the first section there will be a review of the literature on changes in the accounting profession and technologies that can ensure its sustainability, and the second part will present the methodology research on the particularities applied in the accounting systems of Romania, USA and Korea, so that in the last section to be detailed and discussed the results obtained from the research.

2. Review of the specialized literature

As some authors state (Lacurezeanu; Tiron; Bresfelean, 2020) RPA refers to the automation of repetitive, structured, rule-based tasks and can be considered a type of software that mimics the activity of a human being in performing a task in a process. In other words, RPA contributes to increasing the efficiency of the business process and to reducing human errors and costs, it can interact with other software applications at the user interface level, but it is not intelligent, in the sense that it cannot adapt to changes, it cannot take complicated decisions. In a broader vision, RPA is a combination of related technologies such as autonomous systems, machine learning, artificial intelligence and robotics, which uses the basic applications existing in the company: RPA accesses and manipulates spreadsheets, documents and e-mails for to complete the tasks.

The software can automate activities that involve copying and transposing information between the database and work tools (excel), reviewing bank reconciliations, checking the correctness of accounting balances in account statements with accounting balances. These verifications follow a certain procedure and occupy a large part of the time allocated to audit

missions, being at the same time prone to human error. The integration of RPA in accounting but also in financial audit missions would prove to be an intelligent and extremely useful work technique (Cristea, 2020).

As with any new technology, the implementation of RPA involves the complete redesign of information processes and systems, the reorganization of the entire flow of activities and also a reset of the elements related to the organizational culture of the company (Colesca and Dobrin, 2006). The RPA implementation process includes the definition and analysis of the characteristics of the activities that will be automated, the analysis of the risks inherent in such a process, as well as the choice of a licensed software for RPA. In this regard, some authors (Huang and Vasarhelyi, 2019) state that the implementation of RPA can take several months or several years, depending on the complexity of operations and activities for which automation is desired.

In a broader view, RPA is a combination of related technologies such as autonomous systems, machine learning, artificial intelligence and robotics (Anagnoste, 2017). More specifically, using the basic applications existing in the company, RPA accesses and manipulates spreadsheets, documents and e-mails to complete tasks. In the opinion of Kaya et al. (Kaya, 2019) RPA can easily automate current activities, processes in different departments, such as production, finance and accounting, sales, procurement, supply chain management, customer service and human resources.

Automating certain processes by using robotics is a significant step towards digitizing the business environment. The biggest challenge of implementing RPA in general and in this case in our study is how employees will be able to interact with RPA and the whole set of emerging technologies that come with it. The responsibilities of future accountants will go beyond the current sphere of accounting and financial reporting by moving towards complex data analysis, forecasting and consulting. This change entails the need to improve skills and competences on new technologies and the handling of large volumes of data, as well as their efficient integration. The emergence of new skills will also require the emergence of new jobs, whose names could be such as professional accountant specializing in data analysis of large volumes (data scientist), Blockchain or cloud accounting or database analyst or cybercrime specialist or systems integrator or data security specialist (Lacurezeanu; Tiron; Bresfelean, 2020).

Referring to Cloud Computing technology, a study conducted by Aberdeen Group, a research and market research company (Ionescu, Prichici, Tudoran, 2014), shows that Cloud applications implemented in the flow of accounting processing lead to an immediate increase in productivity by 25%, a 50% reduction in invoice processing costs and a 91% improvement in customer satisfaction.

3. Research methodology

In order to achieve the purpose of the paper, we followed a systematic review of the literature and consider making major contributions to the development of knowledge, highlighting the particularities applied in the accounting systems of Romania, USA and Korea. The review period varies between 2006 and 2020.

In order to provide a more comprehensive perspective on current developments in new technologies in the accounting industry, we continued to look for professional reports, articles and websites of the main accounting firms and professional associations in the countries concerned. Thus, one of the largest bakery companies in Korea, Orion, recorded a significant decrease in the rate of return of products This was due to the use of cloud-based Sales Posting

Data (POS). Orion has increased its sales by identifying real-time changes in consumer trends in real time. eBlueChannel, another Korean company that uses cloud-based POS data to manage data-driven drug stocks, which connects with manufacturers, pharmacies and wholesalers. Therefore, I can quickly identify drugs and drug inventory. It is a complete medical platform that combines cloud services: therefore, they can manage their inventory more efficiently. (Yoon, 2020).

Numerous studies (Mateescu, 2019) have shown that in Europe, especially in Eastern Europe, there has been a reluctance to adopt various technologies because accountants have the impression that automation will replace them. online digital, accountants are not replaced, but are 'improved' with digital tools to be able to work a much larger number of companies.
On the other hand, in the US, accountants realized many years ago (as early as the 1980s) that software automation could free them up a lot of time, avoiding consuming countless hours by entering numbers in columns and allowing them to focus on services that add value to the client, such as specialized consulting (Mateescu, 2019).
Regarding the acquisition of RPA licenses, there are already RPA software tools made available to companies by various vendors, which can be used for partial or total implementation. According to the authors (Lacurezeanu; Tiron; Bresfelean, 2020) the most important providers of RPA implementation solutions on the market are:

- Automation Anywhere (SUA);
- BluePrim (Marea Britanie);
- UiPath (România);
- RedWood (Olanda);
- Workfusion (SUA);
- Openspan (SUA).

For a major Malaysian company specializing in providing pharmaceutical services to the national hospital network, UiPath has implemented automation solutions in the logistics department, where employees face a very large volume of repetitive tasks. The company's software robots have automated ordering and billing processes, as well as the function of updating data in their database. As a result, the company was able to increase its efficiency and reduce the processing time of these tasks (Mateescu, 2019).

Results

In order to achieve the purpose of the paper, to present the applicability of emerging technologies that outline the accounting profession, the methods, working tools used, and balancing the advantages and disadvantages of their adoption, this section focuses on accounting systems applied by Romania, USA and Korea.

In Romania, software automation has not yet taken over the field of accounting as it happened in the West. There are some tech startups that try to bring technology and new innovations in accounting, coming to the aid of companies, but things are going quite hard.

According to an article posted on the official website of the Romanian automation service provider (EY.com), technology may allow financial teams to focus on value-driven reporting, but not all organizations have implemented these systems. The most agile financial and reporting teams are advanced in using robotic process automation (RPA) to drive new levels of efficiency and use rules-based robotic technologies to automate financial processes with a high volume of transactions.

Of major importance is also the blockchain technology that records transactions using a distributed log, which gives each network participant a secure audit trail of all transactions ever made, almost in real time. Some commentators expect the technology to become the industry's standard for reporting and accounting, replacing existing back-end IT practices and traditional reporting. If blockchain technology is used to automatically consolidate accounting records, then reporting teams can spend less time cross-checking and aggregating and more time analyzing credible data.

EY Romania (Ernst and Young, 2017) has obtained a new accreditation from UiPath for process automation services and becomes the first partner in Eastern Europe certified UiPath Services Network (USN). Under the impact of the Covid-19 pandemic, business models have undergone profound changes, which has led more and more companies to reprioritize investments in technology and to focus on digitizing jobs and facilitating the conduct of daily activities through telework. This rapidly changing context is forcing companies to become more agile, so automating redundant activities is becoming more relevant than ever.

In Romania, as well as the other countries located in Central and Eastern Europe, the scale of technological advances will transform the way accountants carry out their activity in the next 10 years, in a percentage of approximately 51%, as highlighted in the figure below. (ACCA Report, 2014).

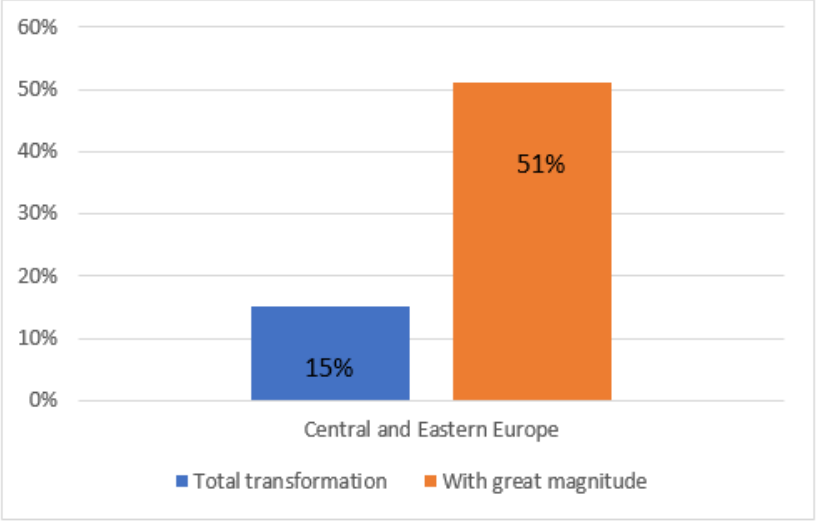

Figure 1. The share of technological impact in Central and Eastern Europe

As technology develops rapidly, so do accountants, the accounting profession in particular, must anticipate the changing needs of companies. It must increase its technical expertise with a broad understanding of the application of existing and emerging technologies and the new skills they require. Accountants and financial professionals need to be open to the changes generated by big data, cloud, mobile and social platforms and to meet the demands of cybercrime, digital service delivery and artificial intelligence.

Some of the skills needed in the next decade would be:

- Knowledge of application integration;
- Working knowledge on IT connectivity and security;
- Management skills;
- Understanding and ability to use customer portals;

- Knowledge of data extraction tools;

The study "Cloud Adoption 2012", conducted by Consult Blue at the request of CIO Council (Association of Directors of Information and Communication Technology in Romania), shows that 55% of large companies in Romania use, in various forms, technologies in the category of Cloud Computing (Ionescu, Prichici, Tudoran, 2014). A Cloud Accounting application is an accounting application that is accessed from anywhere with an internet connection, without the need to be installed and managed on its own servers.

At the end of 2010, the Rompetrol Group - Romania opted for the development of an IT&C infrastructure in the Cloud (private Cloud), based on Vblock, a solution offered by the VCE alliance (Ionescu, Prichici, Tudoran, 2014). The project aimed to provide resources for the SAP environment. The impact on the company has been beneficial on several levels. From a financial point of view, for the Vblock project, Rompetrol estimated: an ROI return on investment of 22% and an internal RIR rate of return of 64%. From the point of view of operational efficiency, the following benefits were registered: optimization of operational costs as a result of consolidating the IT environment on a unitary infrastructure; reducing by 50% the load of the team that manages the IT environment.

The USA is the country that invests the most in technology and is home to both the largest accounting and auditing companies and the largest IT companies in the world (Lacurezeanu, 2020). Most studies have concluded that Rutgers University, Newark, New Jersey (USA) is the leading RPA research center in auditing.

The future of accounting is bright, with a projected 10% increase in employment in accounting and auditing between 2016 and 2026, according to the US Bureau of Labor Statistics. Not only does the future of the accounting profession look promising, but the industry is also evolving rapidly with the growth of technology (Cooper, Holderness, 2019).

A report by Harshman Phillips, which provides accounting services in the US, provides a deeper picture of the benefits that Cloud brings to the operational level of a business, in financial-accounting activity (Wiley, 2010). Cloud Computing is slowly but surely transforming the accounting industry by providing the opportunity to streamline accounting processes in order to reduce costs and adopt value-added services in a subscription-based system. Through the software-as-aservice (SaaS) platform, professional accountants will be able to provide services in an innovative way. SaaS is the most common form of Cloud, which involves the use of third-party managed applications without the need to install additional applications.

Although the benefits of Cloud Accounting technology are recognized at the corporate level, the implementation of Cloud applications is quite slow, due to the uncertainty of management in terms of control and ownership of information. According to a study, (Wiley, 2010) data security and confidentiality are among the main concerns of users regarding the use of cloud-based services. Security concerns are based on the fact that confidential company information is stored on a server that can be accessed via the Internet and not on your own computer.

Cloud computing is the future of accounting procedures in small and medium enterprises. Accountants need to seek training to learn cloud computing operations for their survival in accounting jobs. Cloud computing cannot replace accountants but only makes their jobs more efficient (Murphy, 2011).

In the US, the scale of technological advances will transform the way accountants operate in the next 10 years, at a rate of about 57%, 6% more compared to Central and Eastern Europe. (ACCA Report, 2014)

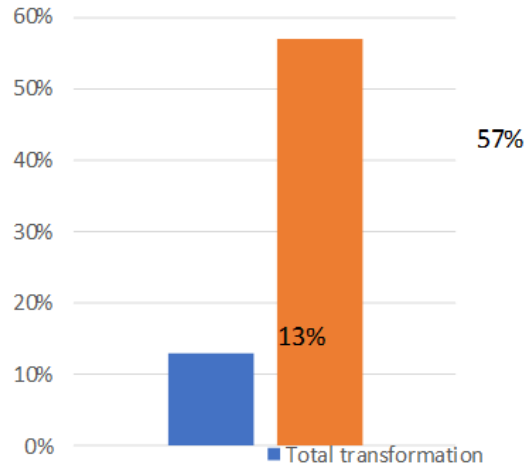

Figure 2. The share of technological impact in the USA

In Korea (Yoon, 2020), using the Cloud system, small and medium enterprises, start-ups run with an inter-business e-commerce platform. They operate several integrated accounting systems that use different types of Big Data, including videos, images and even drones. One of the best known cloud accounting systems is Enterprise Resource Planning (ERP). All information from the company, as well as supply chain management, as well as information about customer orders are managed collectively. Accounting is the core of the ERP system because accounting data is the key information that manages all levels of business in an integrated manner.

Oracle ERP Cloud is widely used by large companies in the Korean market because it allows companies to manage large volumes of data in the cloud without their own data center. Oracle recently announced new Cloud applications, including AI, digital assistant, and Analytics designed to benefit from these technologies, such as cost savings and improved productivity and management capabilities.

South Korea is currently finding ways to actively introduce AI to prevent accounting fraud. In this regard, an accounting software provider has announced an accounting improvement solution called "Attack Board". This is a system in which all employees even managers can access and view the key performance index (KPI) (it is a Korean performance, an evaluation system that is adopted from the concept of Balanced Scorecard (BSC).), Configuration until reaching the plan of business and purpose. (Yoon, 2020)

Korea is also looking for ways to introduce Blockchain technology in line with the changing era. The Korean government has announced Blockchain as the core technology of the Fourth Industrial Revolution. It strives to promote, educate and prevent the future technology industry (Shin, 2017). Blockchain refers to a technology that distributes and stores all transactions and various data of all participants in a shared network. It can be applied to all forms of record management and contracts where security is important. In addition to the financial sectors, the blockchain is also used in other areas, such as identification, notary, ownership, voting, transportation and electronic distribution.

In Korea, the scale of technological progress will transform the way accountants operate in the next 10 years, at a rate of about 64%, and a total transformation of 19%, with the highest percentages compared to Romania and the USA. (ACCA Report, 2014)

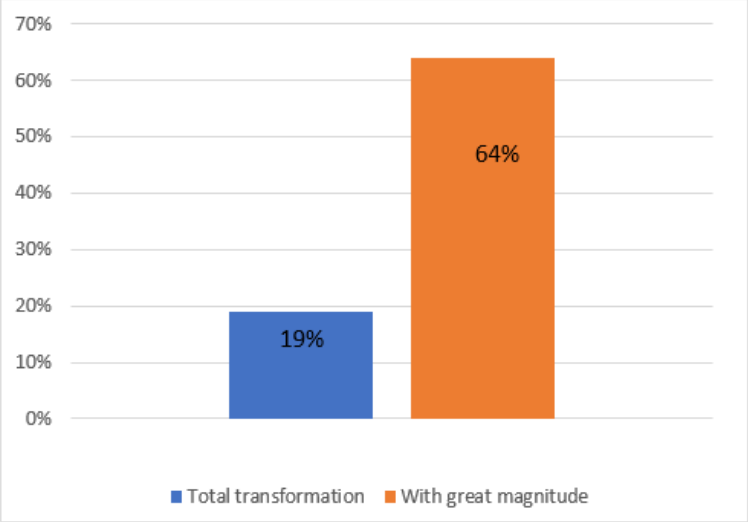

Figure 3. The share of technological impact in Korea

4. Discussions

Studies (Ionescu, Prichici, Tudoran, 2014) show that technological advances will require new skills and competencies from accountants and finance professionals, from change management to knowledge of data extraction tools from the multitude of information held by companies. . In other words, the accounting profession needs to adapt in order to develop in the context of technological advances (ACCA Report, 2014).

Professionals must:

- to develop and change their managerial style;
- assess risks and address security issues;
- to explore in detail the impact of automation;
- prepare for changing work patterns.

But ultimately, they need to use technology to create added value. Here is the real opportunity of technology.

Technology will not take accountants away from clients but will bring them closer, because they will have much more time to communicate about the real problems of businesses. This goal is difficult to achieve even with major productivity gains if accountants do not change their mindset and the way they work. Once released from most tasks, they are able to discover opportunities and offer customers changes in the way they run their business. I can truly become that trusted partner of the entrepreneur.

In the context of the continuous and dynamic development of technology, we are witnessing a capture of all fields by a phenomenon that seems to represent, without a doubt, our future: the robotization of services.

RPA is becoming more and more present in the financial accounting activities of large companies and also of companies specialized in providing accounting and auditing services due to the large volume of data needed to be processed and due to cost reductions, processing times and errors that I bring them with me (Mateescu, 2019).

The accounting profession can play an even more important role in the future by adapting to and mastering the requirements of new emerging technologies. Future generations of successful professional accountants will need, in addition to traditional knowledge,

knowledge in the area called IT, AI and RPA, but also developed social skills (Laurezeanu, 2020).

This study presented the major contributions that technologies make to the development of knowledge, identifying the patterns of implementation of RPA in accounting, the cloud system with its advantages in parallel with possible future developments, opportunities and threats. At the same time, the perspective of future accountants was addressed, whose responsibilities in the future will go beyond the current sphere of accounting and financial reporting by moving towards complex data analysis, forecasting and consulting. This change will lead them to improve their skills and competencies in new technologies.

Given the current situation, in which most companies operate in the online environment, demonstrates that technology is constantly evolving, and this is true in the field of accounting.

In addition to the advantages that automation brings, there are certain limits or in other words "threats".

A first threat is strictly aimed at those who practice this profession and who will have to diversify their skills. Robotization will never take the place of the accountant, but it will make his work easier, he having to check, to analyze things much better. In this regard, the best solution would be for future accountants to become as familiar as possible with the advanced features - such as forecasting and analysis - offered by accounting software, so that they are better equipped to interpret and translate data.

Another threat falls within the realm of cyber security, which means that accounting information (for example, credit card information, bank account numbers, passwords) is a target for hackers because it can be of great value. In order to prevent this, according to an article (Conrad, 2019) it is recommended:

- regular updating of accounting software, which has the role of usually correcting security vulnerabilities;
- allowing access to certain data only to those authorized;
- elimination of unnecessary data;
- using the cloud, being almost the most secure data center.

According to an article by Hunter, (Hunter, 2021) posted on the International Federation of Accountants (IFAC) the profession is witnessing a threat to its future viability as a result of three general challenges: the challenge of attraction; challenge relevance; and the challenge of change.

The first challenge can be seen in the volume of data showing that fewer young people than historically have been attracted at an early age to pursue a career as an accountant. Subsequently, they do not study accounting as a discipline. One of the impacts felt by professional accounting organizations is the reduction in the number of graduates ready to enter certification programs.

This leads to the second challenge of relevance. Increasingly, accounting is facing a lot of social preconceptions that state, without clear evidence, that robots will take over jobs; the demand for accountants will be declining and that technical accounting skills are automated.

The third and probably most intense challenge of all is that the new "skills economy" places a greater emphasis on workers who need more granular accreditation for skills that will need regular updating and replacement. That is, the initial education and certification of an accountant will no longer be sufficient to guarantee employment throughout the career.

Regardless of the challenges that will arise in the future accounting profession, it is certain that automation will produce major changes, but which will be felt gradually and which will do nothing but help and lead to a more productive and efficient future.

5. Conclusions

This research highlights the mechanism and applicability of RPA artificial intelligence technologies, but also of other software, in parallel with the new trends of the future of the accounting profession.

The general conclusion is that RPA automation would significantly minimize human error, leading to improved efficiency and productivity at work. Even though in Europe the implementation and the total transition to automation is taking place at a slower pace, in highly developed countries this is already progressing, RPA becoming more and more present in the financial accounting activities of large companies and also of companies specialized in providing accounting and auditing services due to the large volume of data needed to be processed and due to cost reductions, processing times and errors they bring with them.

Based on the analyzes undertaken, we can conclude that online accounting will change the accounting profession. It will lead to a considerable improvement in the way financial activities are carried out, in the interaction with customers and in the speed and efficiency of responding to their needs.

The accounting profession can play an even more important role in the future by adapting to the requirements of new emerging technologies. Future generations of successful professional accountants will need, in addition to traditional knowledge, knowledge in the area called IT, AI and RPA, but also developed social skills. RPA being a relatively new field, the study was based on some articles, recently published, which present debates and approaches made at international level, respectively USA, Korea, but also Romania. According to the analyzed statistical data, it is predicted that in 10 years in Korea the magnitude of technological progress will transform the way accountants carry out their activity, in a percentage of about 64%, and a total transformation of 19%, having the highest percentages compared to Romania and the USA.

The accounting technologies introduced in this study have now become basic trends that cannot be delayed or avoided. This transformation is expected to be accelerated, especially after COVID-19. Without understanding and adopting these technologies, we cannot survive in a business in an environment prone to change.Moreover, while new technologies offer many opportunities, there are also associated risks that future experts must take in order to learn to live with new technologies.

However, real-life activities that require intelligence, professional reasoning, such as negotiation, persuasion, creativity, understanding, and interaction with complex models are difficult to replace with AI. Therefore, we must understand that these technologies are not tools to replace experts, only those that improve estimation and predictions.

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