

## OPPORTUNITIES AND CHALLENGES IN THE ACCOUNTING PROFESSION BASED ON THE DIGITALIZATION PROCESS

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### Abstract

*Accounting is embedded in an environment that has undergone radical changes in communication and collaboration for a long time. Successful digitization in a company also has to do with being prepared in accounting. This means recognizing digital trends in good time, assessing them and using them to our advantage. Due to COVID-19 and the associated restrictions, digital working methods are increasingly becoming the focus of domestic companies. This also applies to accounting. Thus, the aim of this study was to present an overview of the various digitization processes in the accounting field that can help companies in the selection of the best one for them. In addition, we want to highlight the significance of digitization and more than that, we want to increase knowledge and intensify abilities in order to decrease the reluctance of companies to step into this field. The results of the research show that there are a series of variants for digitizing on the market, the important process being the one to make the optimal choice for each company according to their needs.*

**Keywords:** *accounting, automatization, artificial intelligence, digitization*

**JEL Classification:** M40, M42

### I. INTRODUCTION

The progress of the world is more and more amplified, tending towards a continuous and quick evolution and generating a high flow of events and processes in which the professional accountant is also found, being the same professional who experimented the transition from paper to the most advanced gadgets, the one who experienced moments of high freshness of the profession, but who also faced the involution, thereby determining a high level of adaptability and compliance that will help them in any future challenge posed by the modern economic environment.

Accounting, mainly in European style, is in full swing and development, given the changes in the economic and financial market, but also the effective implementation of a European strategy to make standards such as IAS or IFRS to be mandatory, these regulating the preparation of financial statements, the consolidation of the listed companies' accounts, etc. International accounting standards cannot, by definition, be a miracle remedy; indeed, they have been drawn up voluntarily by excluding any legal constraints, but not by considering the cultural, economic and historical specifics of each nation. In addition, they are written in a literary manner, sometimes leaving a relative inaccuracy with respect to the appropriate technical treatment. Changes in these standards are also foreseeable at some point, as they are influenced, among other things, by the ever-increasing digital evolution.

In the field of accounting, digitization consists in an automation of everything that means working tools, starting from the storage of information and to the actual creation of records. At the same time, digitization inevitably occurs among companies, generating a digital revolution in the approach and internal group. The latter, recognitions to digital tools, ensures that the workers are connected to each other, to the company and to the outside world.

In recent and popular discussions on this side of the digitization of the accounting profession, the benefits of this process are frequently mentioned. It is identified that the digitization of accounting unquestionably saves time and simplifies cash flow management, as well as generating a better focus on essential tasks. In fact, the introduction of new and digitized accounting elements is carried out continuously due to the automation of flow and data recovery facilitated by accounting digitization tools.

This is a real solution that makes it possible to avoid repetitive tasks of a large number of documents that have to be processed manually, inevitably reducing the risk of errors. Therefore, this digital wave is helping to simplify the accounting profession while strengthening customer relations.

At present, we note that digitization has an impact on almost all sectors, expanding its influence more and more. We can say that with the pandemic situation, digitization has evolved in an unexpected way, the connections between people and companies, being in full expansion through various devices, software, etc. In the analyzed context, the knowledge of computer systems and their understanding are becoming increasingly necessary tools for accountants, their professional training should consider very seriously obtaining these abilities. Clearly, the concrete impact of digitization on accountants cannot be known, as it is still an evolving situation. Therefore, with the evolution of technology, the nature of accountants will certainly change and the accounting profession must accept that and move towards the opportunities generated by the new digital era, embracing the challenges that come with it.

## II. RESEARCH METHODOLOGY

The paper is based on fundamental research, including the impact of digitization on the accounting profession and the way in which the accounting is influenced by new technologies. Therefore, it is attempted to formulate an objective perception of the reality regarding these issues, and at the same time, it is intended to understand the interaction between the advantages and disadvantages of digitization. The research method is based on various studies and analyzes that are conducted by specialists which deal with the subject of digitization in terms of accounting profession. We consider that the revision of the literature, respectively of the previous research in a certain field, represents an essential tool that any scientific approach must use, because an efficient revision of the relevant literature creates a solid theoretical foundation, facilitating the identification of research areas where additional research is needed, being in the same time the foundation on which new discoveries are built. The identification and analysis of previous studies has helped us to create the premises for generating new knowledge, trying to reduce the subjectivity of the researcher through a more rigorous approach. Last but not least, the aim is to draw concrete conclusions on these issues.

## III. THE IMPLICATIONS OF DIGITIZATION ON THE ACCOUNTING PROFESSION

Accounting is one of the oldest branches of the economy and can be the discipline characterized by the most constant changes that occur in a very short period. Examples of this can be changes of the law, findings of new modern technical solutions and procedures and interaction with various institutions or professional bodies, which the accountants are required to consider and comply "today", look for solutions "tomorrow" and test them "the day after tomorrow".

From ancient writings it is reported that accounting practices have always existed and evolved to what we know today from counting goods and marking them on clay tablets, to practicing these trades with paper, from single-entry bookkeeping to double-entry bookkeeping. After that, the computerized accounting appeared, using nowadays the help of certain more and more professional software, having different tools connected to a network, with digital signatures, correspondence and digital reporting, as well as through other complex technological systems, which are becoming faster, more robotic and which tend to replace the human responsibilities of this profession.

In fact, the digitization of accounting can be represented as a process that seeks to improve tools, professions, or even traditional objects, through new technology, in order to make them more efficient. By adapting more and more to digitization, an accountant implicitly reduces the time given to the work of archiving and handling paper documents and he can choose his management platforms, suppliers, customers, all this dematerialization allowing him to save money by reducing paper issuance, classification and processing. It also facilitates the reduction of operational tariffs, thus having greater flexibility in data generation, transmission and analysis.

Accounting is often considered time-consuming. Therefore, the tools of digitization support the transformation of companies in this field, these being available for all types of businesses that want to simplify their accounting, such as independent companies, SMEs, or large companies, each one of them having the possibility to choose the right solutions. Not only do these digital transformation tools save time, but they are also accessible to everyone and anywhere, giving the possibility to edit offers, invoices, export or import data, connect to bank accounts and so on.

Digitization encourages accounting firms to begin a transition to digital and to offer new ancillary services to be more and more efficient. In this context, the accountant must be up to date with the latest digital tools both to meet customer expectations and to comply with new legal and regulatory obligations. Now it becomes necessary for the accountant to provide his clients with a set of software and applications to help them optimize their business management.

Following the performed analyzes, we found that there is no official definition of the concept of digitization, but according to some authors (Gartner IT Glossary), we find that it disassembles a process of transition from an

analog to a digital form, a process in which there are used digital technologies in order to offer different opportunities to a company.

Several authors argue that both the audit profession and accounting firms must accept the inevitable effects of digitization and need to become familiar with digital interventions.

For the success of a digitally transformed audit, we find that the technological platform / software used is extremely important and it must connect all members of the audit team, effectively, both between themselves and with the audited company. At the same time, such a platform digitizes the generation of working documents, acts as a central repository of relevant data, initiates correct updates in real time, and allows auditors / companies to change information quickly and securely. In this context, there are several types of technologies that can be used, including big data, blockchain, RPA, etc.

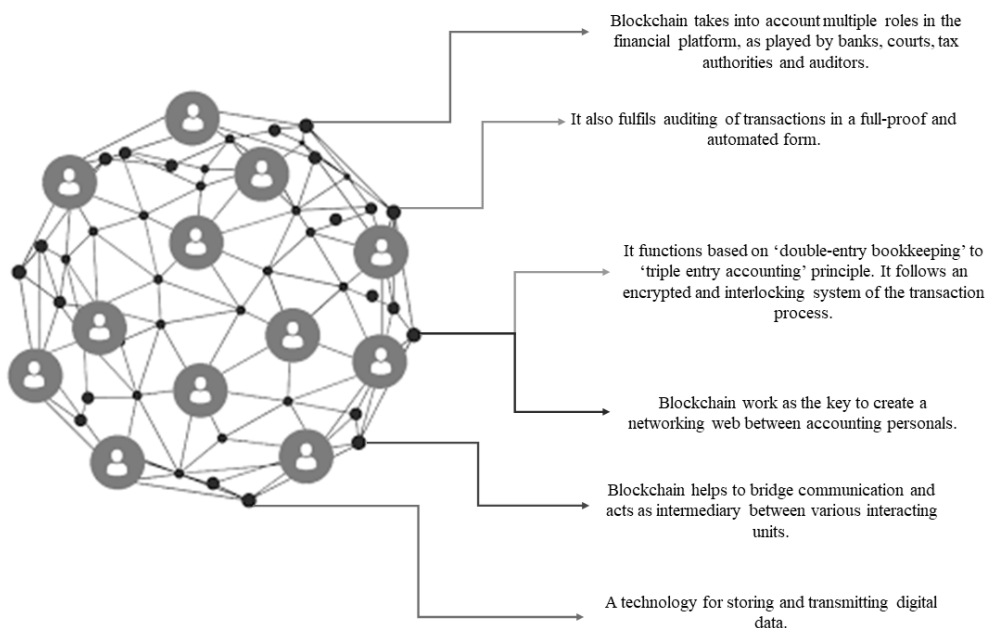
**Big Data**

Regarding the Big Data concept, it refers to data that involve a greater variety, thus being received in increasing volumes and speeds. In short, Big Data means large and complex data sets coming from new data sources. They are so bulky that traditional software cannot handle them. It was found that there are three main characteristics of it: speed, variety and volume. Speeds are the rate at which data is received and accessed, these processes normally taking place in real or near real time; the variety refers to the many types of available data, such as text, audio, video, etc.; volume is also a very important part, because Big Data processes large volumes of unstructured, low-density data (Cockcroft & Russell, 2018; Balios, 2021).

**Blockchain**

Regarding the second concept – blockchain - it is defined by some researchers as "a network of nodes (i.e. user computers) that work together to produce an immutable / permanent history of transactions and that can be viewed by the public. To understand concretely how the blockchain works, we mention that it is a technology for storing and transmitting digital data. Knowing the origin of data in circulation is possible thanks to this technology because each movement is tracked using a register. Each new made transaction is automatically stored in a block related to the other blocks related to previous transactions. From the different blocks connected to each other, a chain of blocks is formed to form a blockchain. Therefore, the blockchain allows users to trade directly with each other, without the need for a trusted third party (Gruber, 2013; Hawlitschek et al., 2018). This technology can be compared to a large notebook or an open book that anyone can consult for free, but from which no information can be deleted or destroyed (Yu et al., 2018). Indeed, blockchain could radically change the working methods of accounting firms and the way they design and develop their business (Liu et al., 2019).

Moreover, in the blockchain, a low value transaction currently takes about 10 minutes to validate, because a single block check is considered appropriate. The more blocks pass before a transaction is considered verified, i.e., the further it is in the chain, the more permanent the related transactions. Usually, a high-value transaction will take about 1 hour to verify (6 blocks). Compare this to traditional financial transactions, where information could take up to a month or more to clear. This real-time blockchain verification feature could also have an impact on the audit process. Instead of year-end (or interim) evaluations, audit firms will be able to conduct ongoing online evaluations throughout the audit period (Figure 1).



**Figure 1 - How blockchain affects accounting**  
Source: Own processing

**Features and benefits of Blockchain technology:**

- **Transparency and traceability:** The blockchain contains information that cannot be modified or deleted and that is shared by users. Additionally, each performed operation is permanently recorded on the blockchain, thus making it possible to track the route of each stored information. Indeed, the longevity and coherence of the system are ensured by reproducing the record that it creates in the memory of the independent computers in one of the others (network nodes). Transparency and traceability would increase user confidence (Sunny et al., 2020; Centobelli et al., 2021).

- **Data security or protection:** The data recorded in the blockchain is secured by crypto encryption, authenticated and certified, being immutable because the block eliminates friction errors and reduces their risks. Indeed, the need for validation by a set of nodes makes it possible to significantly reduce the risk of malicious acts, hijackings, or hacking. The nodes control each other, making this possible without a central authority, being also possible to anonymize users (Demirkan et al., 2020; Fuller & Markelevich, 2020; Shao et al., 2021).

- **Decentralization:** The blockchain facilitates transactions without the central network, which ensures control and governance of the system. In fact, the validation of the operations registered there is not performed by a specific actor, but by a constraint whose modalities are defined by the chain. If we combine this technology with smart contracts, it becomes possible to schedule an exchange of values between two parties without intermediaries. The elimination of intermediaries would thus make it possible to increase productivity and efficiency and reduce transaction costs such as inspection and verification fees, etc. These characteristics make blockchain technology a revolutionary technology that can lead companies to design new methods and work organizations and change their business models (Yu et al., 2018; Bonyuet, 2020). In this sense, Beck and Müller-Bloch (2017) consider that blockchain is not an incremental technology (which consists of adding functionalities to an existing technology), but rather a radical innovation because it has developed new functionalities that go beyond the existing ones regarding technologies and practices (Utterback & Acee, 2005; Betz & Khalil, 2011).

- The blockchain allows the registration of the transaction as a single event, which is validated by the juvenile community. This process is very effective for companies, as it saves them the need to enter and store the transaction in multiple databases, saving time and significantly reducing human error and fraud (Kokina et al., 2017; Appelbaum & Nehmer, 2020; Cai, 2021).

In recent years, the blockchain has aroused more and more interest from researchers in various fields such as finance, marketing, supply chain and so on. However, to our knowledge, few studies have analyzed its application in auditing. Zemánková (2019) states that while in the field of finance there have been reflections on the blockchain, the areas of audit and control have been neglected by academic research. Research in this area remains insufficient to cover all the implications of blockchain for the audit profession.

Most current research focuses primarily on the relevance of blockchain in audit processes and its ability to optimize existing audit procedures (Dai & Vasarhelyi 2017; Kokina et al., 2017; Liu et al., 2019; Smith, 2020). Yermack (2017) showed that the blockchain could provide assurance on the accuracy and reliability of transactions and can allow real-time disclosure of information. Kokina et al. (2017) provide an overview of the use of the blockchain in large audit firms and discuss its main opportunities and limitations.

However, the blockchain also involves IT risks (unauthorized access and threats to privacy), but could have an impact on the traditional accounting process and business development. According to Alles (2015), the use of advanced technologies and blockchain by audit clients would be the reason for the adoption of these technologies by auditors. Blockchain, associated with other digital technologies, could change the audit process by changing the way the auditor accesses data, collects evidence and analyzes data (Rozario & Thomas, 2019). More specifically, audit firms no longer manually evaluate audit evidence, as transaction information is easily accessible and can be tracked and validated via blockchain, saving audit firms a lot of time.

**Business Intelligence**

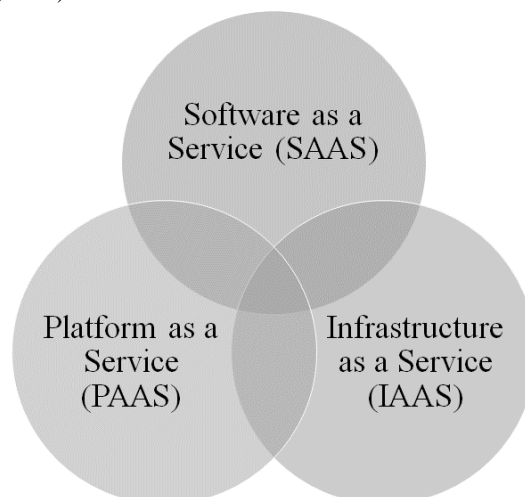
Business intelligence (BI) is a technology-driven process of analyzing data and presenting actionable information to help decision makers make strategic decisions. BI encompasses a variety of tools to gather, collect, and analyze business data from different internal and external systems, processing data into meaningful information, increasing transparency and improving corporate management, helping at reporting reports, dashboards and data visualization (Rikhardsson & Yigitbasioglu, 2018; Chu & Yong, 2021).

**Cloud Accounting Software**

Cloud computing is the provision of IT infrastructures through the Internet. What is a cloud? Since the technical structure made available in cloud computing appears remote and opaque from the user's point of view, one speaks of a "cloud". The IT infrastructures in the cloud can be computing capacity, data storage, network capacity or even finished software. Companies that offer these services are called cloud providers (Khanom, 2017).

Cloud Accounting is a software that has integrated several accounting applications and programs, the plus being that it provides security for stored data being secured with SSL encryption with certificates identical to internet banking systems. This software provides accounting capabilities to businesses in a manner similar to the SAAS business model. There are three main categories for cloud computing services, with these categories

building on each other: SAAS, PAAS, and IAAS (Figure 2) (Rani & Ranjan, 2014; Brandas et al., 2015; Sobhan, 2019; Mohammed & Zeebaree, 2021).



**Figure 2** - Cloud computing services

*Source: Own processing*

**Software as a Service (SAAS):** means that software applications are made available online, usually based on a subscription model. The software is hosted and managed in the cloud and the cloud provider takes care of updates, security updates, etc. SAAS is a cloud-based software transfer process that permits the admission of data from any device with an internet connection. In this web-based model, software vendors host and maintain the servers, databases and codes that make up an application. Because the accounting software is online, in the cloud, the client and the accountant can directly access their accounts and update them through a web browser. It does not need to be downloaded and the cost is much lower than if it is purchased. The online software is accessible on all media (smartphone, PC, tablet) and the data is secured and synchronized on different clusters. Finally, automated layout makes it possible to increase productivity by helping to focus quickly on more complex tasks (Singerová, 2018; Sastararaji et al., 2022).

**Platform as a service (PAAS):** refers to cloud computing services that provide servers, storage, networks and databases for software development. PAAS thus enables faster development, testing and management of web or mobile apps (Sobhan, 2019).

**Infrastructure as a Service (IAAS):** means that IT infrastructures are leased from a cloud provider for use. These can be servers or storage space, for example (Khanom, 2017).

#### **Artificial intelligence**

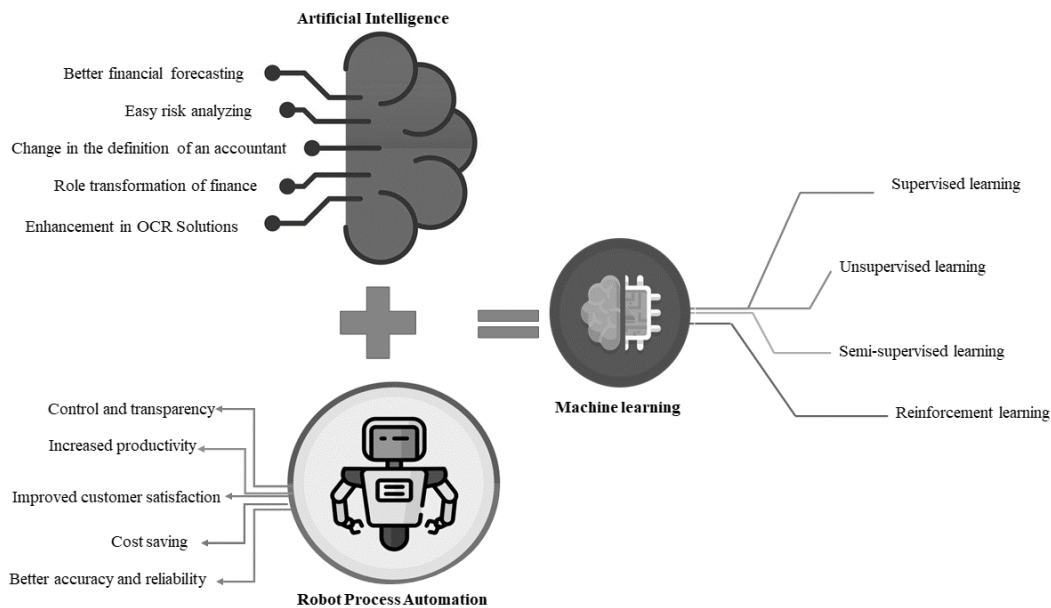
For thousands of years, man has tried to figure out and understand how we think. The field of artificial intelligence research goes beyond that: it not only seeks to understand intelligence, but also to provide evidence of understanding using intelligent technical systems. Artificial intelligence is one of the newest areas in science and technology and describes all research fields that deal with the provision of human intelligence by machines. Artificial intelligence describes a certain number of modern mathematical-statistical processes with the aim of creating a technical equivalent to human intelligence and thereby making automatic decisions based on available information (Zemánková, 2019; Zhang et al., 2020).

Artificial intelligence is said to have the greatest power of transformation in digitization. Due to the steadily increasing amounts of data available, new methods are required to be able to evaluate them. Data are collected more frequently and in many places, (machine data measured by sensors), this being one of the reasons why concepts as machine learning (machine learning), data science and artificial intelligence are taking center stage. They offer a way of analyzing large (un)structured amounts of data and turning them into knowledge (Luo et al., 2018).

Artificially intelligent technologies are based on information technology replicas of the human neural network. They are characterized by the fact that known patterns are stored through learning (the so-called machine learning) with the aim of subsequently solving 'unknown' cases. Machine learning is based on algorithms, which in turn represent mathematical-statistical models that can recognize patterns within unstructured and structured data in order to make classifications, decisions, or predictions derived from them (Ding et al., 2020).

Artificial intelligence can add two new skills to simple RPA applications: self-learning and problem solving (Figure 3). These smart RPA applications can thus be used in a delimited area to solve problems and enable end-to-end automation of business processes even for non-rule-based processes. RPA applications that are equipped with "intelligent" digitization technologies can also perform cognitive tasks and systematize unstructured data sets

(big data) (Ionescu, 2020). These applications are also known as smart or Intelligent Process Automation applications (in short: SPA or IPA).



**Figure 3 - Automatization of cognitive processes**  
*Source: Own processing*

**Robot Process Automation (RPA)**

Robot Process Automation (RPA) is a category of software that automates tasks normally performed by humans, using software robots that follow a set of rules and interact with corporate systems through user interfaces. Therefore, these robots can perform repeatable tasks, perform system integrations and automate enterprise-level task-to-task transactions through scheduled orchestration (Fernandez & Aman, 2018).

The RPA in accounting can contribute to the optimization of operational processes. Digital trends and new technologies such as process automation through RPA make it necessary to rethink and present new challenges not only to company managers. Business accounting and those departments that deal with taxes are also affected by these changes.

With RPA, software robots are entering the market, which will take over repetitive and standardized tasks in the company to an ever-greater extent. Finally yet importantly, tasks that can be automated in business accounting and taxation will be carried out by RPA in the future (Fernandez & Aman, 2018). The following aspects characterize tasks that can be automated:

- The workflow is repeated, rule-based and high-volume;
- There are only a few exceptions that need to be processed separately;
- The process data can be evaluated electronically or by machine;
- The underlying software applications are stable.

RPA mimics the actions performed previously by employees on existing IT systems. Robots imitate things like mouse clicks or keyboard entries, independently and around the clock. Companies use RPA as an automation technology to drive digitization and design commercial business processes in such a way that they run faster and more efficiently (Ribeiro et al., 2021).

The advantages and disadvantages of RPA are the following:

**Table 1. Advantages and disadvantages of RPA**

Advantages	Disadvantages
<ul style="list-style-type: none"> <li>• more precise and faster work results;</li> <li>• increased speed;</li> <li>• increased productivity;</li> <li>• reduction of compliance risks;</li> <li>• reduced documentation effort;</li> <li>• lower process costs;</li> </ul>	<ul style="list-style-type: none"> <li>• RPA implementations can fail;</li> <li>• flexibility of a bots;</li> <li>• the economic results are uncertain;</li> <li>• security risk / risk of cyber attacks;</li> <li>• change management</li> <li>• implementation costs;</li> </ul>

<ul style="list-style-type: none"> <li>• software robots can work with existing IT systems;</li> <li>• reduction of staff bottlenecks;</li> <li>• freed up employee resources;</li> <li>• time saving;</li> </ul>	<ul style="list-style-type: none"> <li>• the need to maintain and update the robot;</li> <li>• building up know-how in the company is almost inevitable, implying also supplementary costs.</li> </ul>
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*Source: Own processing*

### Machine learning

Machine learning is a data analysis method that uses algorithms to identify connections in data. Machine learning enables the automated creation of analytical models with minimal human intervention. Machine learning is part of the research field of artificial intelligence and is based on the idea that systems can learn from data and recognize patterns and laws. Knowledge is generated from experience. Machine learning can be used wherever sufficient data is available (Cho et al., 2020).

## IV. CONCLUSIONS

The impact of rapid development in the field of technology and the Internet opens new opportunities for accounting firms. With the advent of laptops and advanced technologies, flexibility and communication has become much easier. Thus, cloud computing has become one of the most important solutions for most entities. The cloud computing system has brought with it a series of opportunities but also challenges and we do not stop here in the field of accounting. Constantly changing technologies will be more and more present on the market and accountants need to adapt to these new requirements. In addition, digitization in the field of accounting involves the incorporation of disruptive technologies and the transformation of accounting processes to be more agile, practical and assertive. All this effort is made to improve the quality of customer service that an accountant can provide and of course, the productivity and efficiency of accounting activity. Digitization is the way to make accounting an innovative science and a useful part of business.

Automation will also remain a key issue. Since standard processes are the prerequisite for automation, SMEs will also increasingly deal with them in the future. Automation also brings another topic into focus: internal controls and compliance. In the future, the focus of accounting in this area will be more on securing automated work steps through controls. The rapidly advancing technological development offers many opportunities but also challenges. Currently, companies are often overwhelmed by the increasing complexity of the existing offers and the large number of solutions. As a result, outsourcing providers could become an attractive partner in the future, who are already successfully using the relevant tools and thus are helping to cost savings.

Finally, the aspect of how digitization and automation will affect accounting employees should be examined. There is no question that activities will change in the coming years. This is also supported by job profiles. Distinctive IT competence is the common denominator here. From today's perspective, skills in the area of data analysis and interpretation will also be important.

The process of digitization of the accounting profession should be introduced from school, thus strengthening an accounting education that is focused, in particular, on how the new requirements of the digital age could be integrated into curricula to prepare students for practice. On the other hand, the authorities contribute with professional regulations on the digitization of accounting, discussing new standards and guidelines and how they influence reporting.

Finally, the availability of data and the saving of time for other tasks will give the auditor the opportunity to make in-depth analyzes of the data and to develop relevant and useful interpretations for decision making, to develop performance and trend prediction, etc. Digitization will take its influence and accountants will need to reconsider their professional approaches and possibly of the profession.

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