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Challenges of using digital technologies in audit

Изазови примене дигиталних технологија у ревизији

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Abstract: Every company must consider the changes in a digital environment. In the era of digital transformation, the company understands the importance of information technologies, and makes adjustments in the form of structural changes. Modern technology usage provides the possibility of the analysis of previously unimaginable types and amounts of data, and introduces significant changes in the field of auditing. By simplifying the audit work, digitalization has also created new opportunities for IT auditing. The aim of this paper is to present the opportunities and challenges of key digital trends in auditing, or the usage of big data analytics, artificial intelligence, blockchain technology, and robotic process automation. There is an emerging need for auditors to take advantage of digital technology usage and respond to the challenges of digitalization in a systematic and high-quality way. The progress of using digital technologies in auditing is contributing to more reliability and better quality reporting, which is leading to increased trust among stakeholders in the results of audit work.
Keywords: audit, digitalization, digital technologies
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Сажетак: Свака компанија треба да размотри промене у дигиталном окружењу. У ери дигиталне трансформације, компаније увиђају важност информационих технологија, те се прилагођавају у виду структуралних промена. Употреба модерних технологија пружа могућност анализе до тада незамисливе врсте и количине података и уводи значајне промене у област ревизије. Олакшавајући рад ревизора, дигитализација такође ствара нове могућности за ИТ ревизију. Циљ овог рада јесте да представи могућности и изазове употребе кључних дигиталних трендова у ревизији, односно употребу аналитике великих података, вештачке интелигенције, блокчејн технологије и роботске аутоматизације процеса. Постоји потреба да ревизори искористе предности употребе дигиталних технологија и одговоре на изазове дигитализације на систематичан и квалитетан начин. Напредак у употреби дигиталних технологија у ревизији доприноси већој поузданости и квалитетнијем извештавању, што утиче на раст поверења заинтересованих страна у резултате ревизорског рада.
Кључне речи: ревизија, дигитализација, дигиталне технологије
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Introduction

Modern organizations must embrace digital and advanced technology to stay ahead of the competition on local and international markets and meet customers' growing requirements (Musabegović et al., 2021). Digitization is a new trend that requires personnel changes, new approaches to management, and changes in business processes (Nazarova et al., 2021). The application of information technologies is of critical importance for the realization of operational tasks, the storage of financial and operational data as well as the preparation of financial and other managerial reports (Gray & Abdolmohammadi, 2016). Digital business transformation modifies the existing manner of conducting business by using modern and contemporary technology to improve operating performance and satisfaction of customers (Ivanović & Marić, 2021). In an era characterized by digital transformation, management must focus on the risks associated with the functioning of information technologies. Information technology risks do not only threaten the digital environment but also the entire business of a company (Aditya et al., 2018). The digital transformation of business requires constant improvement and optimization of the audit function (Nazarova et al., 2021). The use of new technologies in auditing affects the growth of the auditing companies' competitiveness. The challenges of IT auditing in the context of digitization are reflected in the enhanced available data volume, the new technology appearance and reform regulations and requirements (Dzuranin & Cand Mălăescu, 2016). The increased volume of available data leads to the emergence of problems related to the integrity, reliability, completeness, and security of data. The application of new technologies leads to new chances and risks for companies, which has an indirect impact on IT auditing since it faces new requirements and risks.

Technological advances and the resulting digitization of data and processes have strongly influenced the inputs, tools, and information available in the audit process (Lugli & Bertacchini, 2022). The incorporation of technology into the critical operations of a large number of organizations increases the complexity and importance of IT auditing. For an auditor performing an audit in an IT environment, it is important to understand the characteristics of that environment, since different information and telecommunication technologies present the auditor with different challenges, sometimes making her job easier, and sometimes making it more difficult. The role of IT audit varies across companies, even if they are in the same industry (Aditya et al., 2018). In other words, the role of IT audit cannot be universal since each company is characterized by a different IT audit universe and IT specificities of each audit engagement. Despite the comprehensive and overwhelming impact of information technology, it cannot be said that the fundamental role of audit services has changed. Auditors should still gather evidence that enables them to form an opinion on some aspect of the audit client's activities and to inform interested parties about factual findings. In addition, the basic structure of the audit approach remains unchanged when the audit is conducted in an IT environment. Contracting, planning, testing, and reporting are still the basic framework in which auditing is carried out in an IT environment. Information technologies can be applied at any stage of the audit process (Mariia & Viktoriia, 2020).

The aim of this paper is to analyse the role and importance of digitalisation in the automation of operations and the audit methodology, starting from the planning, control, documentation, and audit itself, to the preparation of the audit opinion. Digital technologies represent a key source of data for decision-making, internal management, planning, and reporting issues. By changing the nature of accounting and auditing jobs, new technologies such as big data, blockchain technology, artificial intelligence, and robotic process automation also affect the growth of audit process flexibility and efficiency.

1. Information technologies and audit

Not so long ago, computers were completely unknown in the business environment, but the situation has changed radically in recent decades (Since, 2021). Today, it is difficult even to imagine that it is possible to successfully organize a business without applying some form of information and telecommunication technologies (Andrić et al., 2011). Companies in numerous industries have transformed their products and activities and transferred them to the digital ecosystem to improve their business and become leaders (Aditya et al., 2018). These technologies have entered every pore of economic life and imposed themselves as a *conditio sine qua non* of survival on the market. Information technologies have an indirect influence on the function of accounting data verification. They also influence the determination of the audit subject since the auditor evaluates the quality of the accounting data processing system. On the other hand, auditors rely on a wide range of computer-assisted techniques and tools in their work, which significantly increases the demand for qualification levels in the field of information technology.

The business conditions in which auditors operate are becoming more and more complex under the influence of globalization, growth in the scope and type of activities, and the use of electronic data. Computer-assisted audit methods can be used to perform a variety of audit procedures, including testing of information processing in the client's accounting system, analytical review of procedures to identify uncertainties, access to data files and libraries, software compliance tests, and testing management and accounting systems (Nazarova et al., 2021). At a time when thousands of accounting transactions take place almost simultaneously, it is not easy to be sure of your conclusions. Auditors are confronted with different IT environments for different clients. Additionally, the same information technologies change extremely quickly, and audit clients respond to these changes with more or less success. The same software platforms can provide different quality of accounting processing in different companies, depending on the success of the software adaptation procedures, staff training, resistance to changes, etc. (Andrić et al., 2015).

The application of information technologies does not affect the change in the purpose of the audit process. However, it should be borne in mind that it directly affects the sequence and methods of its implementation, audit planning, documentation process, assessment of materiality and audit risk, as well as the determination of the scope, content, and method of audit process implementation and evaluation of corroborating audit evidence (Mariia & Viktoriia, 2020). For a long time, IT auditing focused on compliance and disclosure of what happened in the previous period. A modern approach to IT auditing requires the audit to be risk-oriented and focused on business contribution. In other words,

modern IT audit is considered the "right hand" of the subject of the audit, which should contribute to the continuous improvement of business performance, which means that IT audit is to be focused on the future instead of the past (Aditya et al., 2018). Moreover, with the introduction of digital technologies, both the auditors and the clients inevitably support the introduction of sustainable “green” business (Stojanović, 2020).

2. Auditor skills in a digital age

Establishing a digital workplace should be a priority for many firms, but it should not be directed only by technology, while ignoring employees, data, and procedures (Raković et al., 2022). The processing of accounting data by computer usage led to the growth of the required auditor’s skills and competencies. The complex IT environment in which the audit is performed must not lead to the formulation of an audit opinion at a level of assurance that is less than reasonable, as required by generally accepted auditing standards. If the audit wants to keep its place as a central mechanism for ensuring the stability of financial markets, auditors in the IT environment must provide quality audit reports that will contain an opinion that increases the credibility of financial statements to an acceptable level. However, the auditor must take into consideration that the accounting and control environment affected by information technologies also requires specific audit approaches (Andrić et al., 2011). The absence of regulations dealing with specific areas of information system testing by auditors is also noticeable (Andrić et al., 2015).

The exponential increase in the volume of accounting data creates inherent limitations for a traditional audit to provide a reasonable assurance service. Large amounts of information must be used effectively for the audit engagement to be conducted with high quality. Large and complex data sets are analysed in a modern environment with the application of robust and predictive software solutions. In addition, competence in working with large data sets opens opportunities for auditors to offer new consulting services to the market (Earley, 2015; Richins et al., 2017). In addition, data analytics can be used in the area of non-financial data and external data to improve audit planning processes, especially risk assessment, as well as in areas that require auditor subjective judgment, such as going concern and valuation issues (Earley, 2015).

Since data analytics has the potential to improve data availability and insight into data from various databases and sources, auditors gain the ability to use data analytics to detect fraud (Tang & Karim, 2019). An important modern outcome of audit in the IT environment is an improved level of audit testing. The audit profession is currently experiencing a paradigm shift from traditional audits with samples to digital audits of complete data analysis due to breakthroughs in digital technologies (Fotoh & Lorentzon, 2020). The audit approach in the digital environment, which is based on risk assessment, provides the possibility to direct the audit approach towards the detection of anomalies instead of searching through limited data sets, which is the characteristic of the traditional audit approach. By anomalies, we usually mean discrepancies between the data and the auditor's expectations of the data based on knowledge of the business. When combined with artificial intelligence, data analytics has the potential to improve future audits by leading to

the creation of a knowledge base that can be used across different audit engagements and different periods (Earley, 2015). Despite the high expectations that data analytics will enable the testing of complete data sets rather than the sampled data which has been the dominant audit approach for decades, auditors must be aware that this does not mean that they will be able to provide more than reasonable assurance, nor that the meaning of the term "reasonable assurance" will change (Fotoh & Lorentzon, 2020).

3. Digital technologies

Digital technologies today encompass all aspects of business, which affected the change in the speed of business operations of organizations, the level of flexibility in terms of decision-making, strategic positioning, and the achievement of economic efficiency (Bhimani & Willcocks, 2014). The application of digitization in the audit process affects the time reduction necessary for issuing audit reports. A key differentiating factor from the competition is the perception of auditors as professionals who can keep up with technological advances. Companies use digital technologies to reduce costs, improve operational efficiency and improve internal control systems (Fotoh & Lorentzon, 2020).

3.1. Big Data

Big Data analysis provides the ability to process data in real-time, and examine entire data sets instead of focusing on samples. Big data represents an extremely large database that includes financial and non-financial data, emails, social media data, internet pages, phone calls, financial market files, market trends data, customer behavior data and other internal and external data. Big Data Framework includes internal and external data in the audit process (Yudowati & Alamsyah, 2018). The key dimensions of Big Data include volume, variety, and velocity, while additional dimensions are veracity, variability and value (Gandomi & Haider, 2015). Volume implies the size of the data, so big data sizes are presented in multiple terabytes and petabytes. Big data volume is conditioned by factors such as time and type of data, as well as industry type. Diversity encompasses the structural heterogeneity of a data set or a wide range of data types, sources and formats. The last characteristic is the speed with which data is generated, analysed and acted upon and moving in and out of companies, given that existing, traditional systems cannot manage such large data sources. Veracity refers to the unreliability that characterizes some data sources, and tools are used to manage and mine uncertain and imprecise data. Variability implies changes in the speed of data flow, while complexity refers to the generation of large data from different sources. The last attribute of big data is value because big data is characterized by a density with a relatively low value, i. e. low value in relation to the volume.

According to Dagilienė & Klovienė (2019), the use of Big Data and Big Data analytics in external audits relies on the following contingent factors: environment, company size, technology, strategic orientation and structure. Earley (2015) considers that the key benefits of using Big Data in auditing are possibility of testing a large number of transactions, providing a more comprehensive insight into the client's process, easier detection of fraud through the use of methods and technologies, and offer resources and a

better solution to the client's problem. The key motives for applying big data technology are reflected in minimizing hardware costs, determining the big data value before committing a large volume of company resources, and reducing processing costs (Khan et al., 2014).

Big Data and Big Data analytics affect the accounting and auditing practice and nature (Appelbaum, 2016). The need for advanced analytical tools usage was also imposed by the regulatory authorities and the quality control system. Big data techniques as audit tools could add value to the audit process and improvement of audit results quality through reliability, sufficiency, and relevance of evidence (Gepp et al., 2018). The use of Big Data has the best application in the planning and execution phase of auditing, that is, the collection and evaluation of audit evidence. BDA has an indirect influence on the audit planning process since strategies and audit plans are developed relying on information from the client's environment. On the other hand, there is a direct impact on substantive testing, assessments, and reports. The application of Big Data tools provides the auditor with a better perception of the client's environment, a focus on the areas of greatest risk and a reduction in the probability that the auditor will form an opinion that is not correct.

Data analytics represents the process of reviewing, cleansing, transforming and modelling Big Data in order to determine information and patterns that can be used and to form conclusions and support decision-making (Rickett, 2017). The Big Data tools usage has limited use in small auditing companies, since they often do not have enough competent staff, and have limited technology at their disposal. On the other hand, large audit companies treat Big Data and Big Data analytics as a long-term competitive advantage in the audit market and an integral segment of assurance practice which leads to building long-term trust with customers (Dagilienė & Klovienė, 2019). The issue of data reliability verification is given special attention in Big Data-based auditing which provides the opportunity for auditors to perform activities based on structured and unstructured information. According to El Monem Serag et al. (2020) the application of BDA affects the improvement of audit relevance by expanding the scope of audit services, developing a new audit profile, developing a culture of innovation at the level of audit companies, and improving the role of audit as a governance mechanism. As a direct result of the digital revolution that businesses are experiencing, the function of audit specialists is undergoing transition. The use of technology for handling ever-increasing amounts of data can contribute to the delivery of high audits and enables auditors to concentrate mostly on evaluating threats and gaining corporate ideas (Salijeni et al., 2021).

3.2. Artificial intelligence

Artificial or machine intelligence represents the ability of machines to imitate the natural intellect of humans and cognitive skills. It is the ability of the algorithm to repeat the process, for example, to review invoices or control payment and inventory. This is the principle that defines this form of technology as smart and intelligent. Artificial intelligence provides the opportunity to determine extreme and negative values, extremely high amounts of payments in the off-season, double entries of suppliers, and invoices through programmed algorithms. Artificial intelligence represents computer systems in human

intelligence form that includes technologies such as data mining, machine learning, image and speech recognition, and sentiment analysis. Sophisticated models based on machine learning serve to encode accounting entries and improve fraud detection (Ukpong et al., 2019). The key difference between standard digital systems and systems based on machine learning is that one is built for data, while the other is built from data. Therefore, data management is the basis for the application of key audit automation capabilities.

Artificial intelligence technologies such as visual recognition, natural language processing, audio processing, and text analysis create the basis for its application in auditing (Issa et al., 2017). In audit engagements, Artificial intelligence is applied to enhance warehouse operations and issues of inventory affecting the lesser possibility of human errors. Artificial intelligence techniques can scan words, recognize documents, linguistic patterns, and physical shapes and derive supporting information from receipts, reports, records, sheets, transactions, and contracts for further human examination. In the context of artificial intelligence, substantial data and processing power are needed, available in large volumes nowadays. Also, there has been an increase in both proprietary and open-source artificial intelligence software over the past few years (Kokina & Davenport, 2017). Through artificial intelligence, the auditor's time and potential are saved in order to perform tasks with greater added value. In order to fulfil the requirements of Artificial Intelligence usage, the auditing company capabilities should be built in the following areas: data management, data pre-processing, automation with low-variability, and complex automation of tasks (Naqvi, 2020). The development of complex systems based on artificial intelligence, reflected in the form of expert systems and neural networks, aims to help auditors in decision-making, considering the shortcomings of the manual decision-making process.

Under the influence of the digital economy, the traditional audit activity model is replaced with an intelligent AI audit. Artificial intelligence may affect recruitment criteria defined by audit firms, which will unexceptionally include software engineering skills related to Artificial Intelligence. Finally, audit firms would have to be more familiarized with the clients' accounting high-tech software, which would subsequently affect their independence. In the application of Artificial intelligence, it is necessary to consider the correct setting of the algorithm and the reduction of the risk of misuse due to the collection of a large amount of sensitive data, such as personal data. In the following table, a comparison is made between the AI-based audit process and the traditional audit process (Issa et al., 2017).

Table 1: The comparison between AI-Enabled Automated Audit Process and Traditional Audit Process

Phase	Automated Audit Process enabled by Artificial intelligence	Traditional Audit Process
Pre-Planning	Big Data is collected and analysed by Artificial intelligence. The organizational structure of the client, operational methods, accounting, and financial systems feed into AI system.	The client's industry is examined by the auditor. The client's organizational structure, operational methods, accounting, and financial systems are examined by the auditor.

Contracting	AI uses the risk level estimation from the Pre-Planning phase. AI calculates audit fees and the number of hours. The database of contracts is analysed by AI and the contract is prepared by AI The contract is signed by the auditor and the client.	Auditor prepares an Engagement letter based on the estimated client risk. The contract is signed by the auditor and the client.
Internal Controls Understanding and Risk Factors Identifying	Flowcharts, questionnaire answers, and narratives are entered into the AI system Image recognition and text mining are used to analyse flowcharts, questionnaire answers, and narratives. The walkthrough is conducted by drones. The generated video is analysed by AI Risk factors are identified by visualization and pattern recognition. All these data are aggregated by AI in order to identify fraud, and illegal-acts risk factors.	Understanding documents through Flowcharts, Questionnaires, Narratives, Walkthrough. Auditors aggregate information and identify factors of risks. The scope, nature, and timing of substantive tests are determined by understanding IC.
Control Risk Assessment	Controls are continuously examined by continuous control monitoring systems Proper IC implementation is verified by process mining runs by AI. Logs are automatically generated in order to ensure the integrity.	Client's IC policies and procedures examination Assessment of risk for each attribute Controls test Risk reassessment Testing of controls documentation Sampling-based tests on a periodical basis Nature, extent, and timing depend on IC Tests Test of details of a sample of transactions Test of details of balances Analytical procedures
Substantive Tests	Quality of Data and Evidence are ensured by Continuous Data Quality Assurance. Data provenance is examined by AI. Test of details of transactions on 100% of the population. Test of details of balances on a continuous basis. Continuous pattern recognition, outlier detection, benchmarks, and visualization.	Clarity, sufficiency, and acceptability of collected evidence must be evaluated by the auditor. The auditor could collect more evidence or withdraw from the engagement.
Evidence Evaluation	This becomes part of the previous phase	
Reporting	A predictive model for estimating the	Previous information in order to

	identified risks is used by AI. Continuous audit report, graded for example 1-00, rather than categorical opinion (adverse, qualified).	issue a report is aggregated by the auditor. There is categorical opinion such as clean, adverse, and qualified.

Source: Issa et al. (2017)

3.3. Blockchain technology

Blockchain technology was developed due to the bitcoin introduction as a new value unit. It eliminates the necessity for a mediator by enabling direct communication between buyers and sellers. Based on the principle of a chain where each of the participants represents a single link or node, blockchain technology enables all parties in the chain to be equally presented with data, and to carry out different exchanges of values, rights, obligations, and transactions. This is the reverse of the present practice, in which individuals may see distinct records that are individually modified and evolved. This technology can affect all recording processes or how transactions are initiated, authorized, recorded, and also eliminates the need for transaction processors that is centralized. By using the blockchain, it is easy to access all the activities of the past periods. The application of blockchain technology can lead to a reduction in transaction costs and a reduction in transaction settlement time. The adoption of blockchain-based accounting systems is conditioned by the following factors: uncertainty, relative advantage, support of top management, industry, technology readiness, regulatory framework, trust, and competition (Sujata & Shalini, 2021).

According to Nezhyva & Miniailo (2020), blockchain technology is suitable for accounting and auditing since it ensures monitoring of all transactions and system changes, and prevents distortion and manipulation. Blockchain technology represents the primary source of data verification that accountants report to users of accounting-generated information (Supriadi et al., 2020). Joining blockchain technology is usually done by downloading software and the bitcoin ledger. Further, mentioned manner of logging also avoids the blockchain from recording the same element many times in multiple locations which has contributed to an improvement in the accurate reporting of the information compiled by the software platforms. However, blockchain technology cannot completely replace audit judgment, i.e. whether assets and liabilities have been properly valued and qualified and whether a transaction has been conducted between related parties.

There are two basic classifications of blockchain networks depending on whether everyone who has access to the Internet has access to the data in the form of a public blockchain or the data could only be shared with certain participants in the form of a private blockchain (Bonyuet, 2020). Similarly, there is a centralized and a decentralized blockchain. In a centralized blockchain, a central authority provides the ability to access or view data, while in a decentralized blockchain there is the same access level for every participant (O'Leary, 2017). As a result of blockchain technology, smart contracts are created that represent computer code on the blockchain that performs activities under certain circumstances and affects the improvement of business processes, cost efficiency, and the reduction of operational errors. Blockchain provides the possibility of standardizing financial databases and formats so that information is not entered and reconciled in multiple

databases, which leads to an increase in the speed of transactions, saving time and reducing the possibility of human error or fraud (Kokina et al., 2017). On the other hand, limiting circumstances for the use of blockchain technology are reflected in incompatible standards related to encryption methods and information storage, transaction irreversibility that may limit its use in accounting can lead to transactions cancellation, growth in energy costs, blockchain impact on the environment, the possibility of hacking, and employee training problems (Desplebin et al., 2021).

The key features of blockchain technology embodied in the form of transparency, decentralization, security and traceability together with smart contracts affect the way of performing audits and all control activities (Gauthier & Brender, 2021). Blockchain could improve audit quality and narrow the expectation gap between regulatory bodies, auditors, and financial statement users (Kend & Nguyen, 2020). Relying on blockchain-based digitization, auditors could increase the degree of automation, analytics, and machine learning capabilities such as automatically flagging unusual transactions to relevant parties in real-time. With the use of blockchain technology, there is a basis for a greater degree of standardization and transparency of financial reporting and accounting which affects more efficient data analysis. The use of blockchain in the provision of financial services includes the areas of dealing with securities, trade financing, and the internationalization of payments, and some other banking processes. The consumer and industrial products industry uses blockchain in the context of digitalization, and tracking the basis of transactions in various goods. The use of blockchain technology in healthcare organizations aims to ensure the integrity of electronic medical records, invoices, and claims. Blockchain technology usage in the public sector aims to support property registries, such as land registries.

3.4. Robotic process automation

Robotic process automation means software that provides the possibility of realizing activities according to certain rules, with a combination of different application programs and sources. It is software that starts other software applications, and can be used to automate determining business processes (Zemankova, 2019). RPA uses structured input, processes input data through rules, and creates specific outputs. From a cognitive perspective, task automation is a repetitive, low-skill task that could be automated by robotic process automation (Naqvi, 2020). Companies usually find it challenging to recognize which processes could be subject to robotization. Robotization affects simpler and more frequent reporting compared to the previous standardized annual reporting and on the accuracy of data entry through robotic control. Moreover, robotic processes could be run continuously, with unchanged output quality. One of the leading benefits is quick adaptability to new tasks. Considering the ratio of low installation and programming costs in relation to considerable benefits, as well as a wide range of activities that could be subject to robotization, it seems clear why Robotic process automation is becoming an indispensable tool in modern business, including audit engagement.

Robotic process automation provides a number of benefits as they could operate without stopping, they are faster, more resilient, and can be simply adaptable. An improper configuration could quickly interrupt hundreds and thousands of transaction data in a short time. This is because Robotic process automation is able to immediately manage large quantities of operations. Because of this, it is of the greatest priority that they are correctly installed and configured. The key disadvantage of the application of robotization in the audit process is reflected in the insufficient workforce capable of programming the automated process. The key benefits of applying RPA in auditing include time savings from the aspect of repetitive processes, the possibility of daily uninterrupted work, speed, robustness and greater scalability. Robotic process automation processes can influence the growth of customer and seller satisfaction by reducing the time between issuing an invoice and payment, application and approval of credit, purchase order and its realization. The use of RPA in revenue audit can affect the growth of audit quality, considering that it is a high-risk area. In this direction, the use of RPA in the process of reconciliation, analytical procedures, control, and detailed testing is presented in the following figure:

Table 2: Steps of Robotic Process Automation for Revenue Audit

Reconciliation	Log in to FTP in order to obtain audit evidence that is provided by the client. Enter the query to search for a listing of sales and trial balance. Extract listing of sales and trial balance. Import listing of sales and trial balance to Excel or IDEA. Calculate total sales per listing. Compare total sales per listing to total sales per trial balance.
Analytical Procedure	Login to workpaper software of audit in order to access audit workpapers in the previous year. Enter the query to search for the revenue amount that is audited. Extract a report with revenue balance from the previous year. Import report to Excel or IDEA. Compare the total amount of revenue from the current year to the total amount of revenue from the previous year. In case the difference exceeds the materiality threshold, an alert should be generated.
Internal Control Testing & Substantive Testing	Log in to FTP in order to obtain audit evidence that is provided by the client. Enter the query to look for order of purchase, invoice, and shipping listings. Extract and Import listings. Compare quantity and price across the three listings. In case some items do not match, an alert should be generated.

Source: Moffitt et al. (2018)

Regardless of the extent to which audit firms decide to digitalize their clients' engagement, each innovative implementation would contribute to changes such as increasing the accuracy and worth of audit evidence and judgments, given that new technologies would attempt to review all client data, without previous sampling (Alles & Gray, 2020). Additionally, audit firms would develop a culture of innovation, which would require further training from existing employees, while new skills would be required from future employees. Audits engagements performed by audit teams specialized in digitalization are related to audit fees that are between 13 and 35 percent higher than audit fees for engagements that do not support new techniques and technologies.

Conclusion

Digitalization implies the emerging technologies usage in order to create a new business model with opportunities for income and added value creation. Digitization affects the growth of audit quality through the transformation of audit companies into digital companies using modern analytical and robotics tools. There is a new auditor profile developed through required competencies in various technologies and by providing IT-oriented audit services. Digital technologies led by Big Data analytics, Artificial intelligence, Blockchain technology, and Robotic process automation create new risks, challenges and opportunities for the practice of accounting and auditing. The use of digital technologies provides new opportunities for better knowledge of the client and better documentation, reduces the audit risk level, and provides support to the auditor's decision-making process.

Big Data has an impact on the level of audit responsibility, understanding of the client's environment, assessment of the internal control effectiveness, risk and materiality, and analytical procedures implementation. It also provides better identify operational risks, and also impacts audit fees level, productivity, accuracy, and effectiveness of the audit opinion formation. Artificial Intelligence represents a hybrid technology set on the basis of which auditing is changed and supplemented enabling continuous annual auditing, relying on automated data collection, document scanning, testing logical errors, and improved fraud detection based on advanced machine learning. The key impact of blockchain technology is reflected in the implementation of audits in real-time, the reduction of activities performed by accountants and financial managers in the long term, the reduction of audit preparatory work on an annual level, easy insight into the origin and history of company operations, and improving the work of the internal control functions and facilitating reporting. Activities that are defined by constantly repeating rules such as opening and closing accounts, request sending for bank payments, change of employee records, standardized templates, receiving new purchase orders, monitoring the consumption of raw materials, and automatically changing the protection system are subject to robotization. The application of RPA technology as a process driven is based on the fact that too many simple repetitive tasks burden auditors such as preparing audit data, organizing files, integrating audit data from different files, conducting audit testing in Excel, and copying and pasting data (Cohen et al., 2019). Proactive use of digital technologies is of key importance for the auditing profession, as well as harmonizing new technological trends with auditing procedures. Incorporating digitalization into the process of conducting an audit aims to raise the quality of the audit and provide a reliable information base to all interested parties who rely on the audit work results in the decision-making process.

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