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Audit Process Automation – between Vision and Realism

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Abstract

The crisis of the qualified labor force both on the Romanian and foreign market, as well as the need for profitability determined the companies to find alternative solutions for optimizing the internal processes. Robotic Process Automation – RPA technologies bring solutions applicable in context by computer replication of human behavior and by automating the repetitive and usual tasks of employees. Predictably, the audit can be integrated as a perfect client for such offers, especially in terms of mission-specific risks through complete data analysis, due to analytical capabilities clearly superior to traditional ones. Given the extremely important role that an audit opinion has in front of all stakeholders, the involvement of RPA in carrying out work missions must, however, comply with certain rules of professional skepticism and interpretation of the results of financial-accounting analysis. The article supports the idea of automating audit processes through RPA and elaborates a realistic assessment of all the components and efforts that such an approach entails.

Key words: *Robotic Process Automation; digital audit; data analysis;*

JEL Classification: *M1, M2, M4, O3*

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Introduction

On April 21, 2021, at the most powerful stock exchange in the world, New York, the opening bell was rung by a Romanian, Daniel Dines, the founder of the software robot manufacturer UiPath. The company had become a global giant in the market by raising $ 1.3 billion from investors, developing a product based on artificial intelligence and digital tools for large companies and government organizations interested in operational efficiency and automation of routine processes. The software solution produced by UiPath, transformed from a company of 10 employees in Bucharest, into a world leader in the field, is generically known as "Robotic Process Automation (RPA)". It is a name that essentially sums up a complex of tools designed to automate repetitive processes and tasks and in significant volume (Lawton, 2021), replacing or minimizing the intervention of the human factor.

In the current context of adopting RPA technologies in various branches of the world economy, with immediate effect in increasing efficiency in terms of costs, resources and investments by automating information manipulation processes (Chakraborti et al., 2020), the audit must find the most appropriate solutions to manage such tools and, in particular, the results it generates. This research is interested in the implications of RPA for audit from two perspectives:

- Management of information generated by RPA implemented in the audited company, in terms of classification as audit evidence, internal control analysis, etc.;
- Implementation of RPA within the audit firm as information collection tools.

Regardless of the positioning of the automation tools (whether they are within the audited company or are part of the information systems of the audit firm) the article aims to address the legal, ethical and practical aspects of RPA adoption in the field of instrumentation needed for processing of financial-accounting information. Thus, the proposed approach is made starting from the analysis of the current stage of automation of data collection processes within complex organizational processes and continuing with the identification of the main trends of propagation of RPA technologies both in terms of investment volume and areas of application.

Unquestionably, as it results from the studied literature (Rosin, 2018; Vasarhelyi and Rozario, 2018; Wewerka and Reichert, 2020; Vieira, 2015; Lacity, Willcocks and Craig, 2015) as well as from market studies (McKinsey Global Survey, 2018; Deloitte Global RPA Survey, 2018; Forrester, 2017), process robotization will capture more and more areas of activity, but clear limits must be set within which the auditor can fit in order to comply with the condition of professional skepticism and standards.

1. Specialized literature overview

The origins of RPA can be found in the "Screen Scraping" programs dedicated to extracting text from any page or user interface of application, web, image, HTML or PDF file, the results obtained being dedicated to end users, without further processing in the initial version (Liu, 2020). At the same time, the automation of work processes, a process started in the industrial era and found today in applications that replace manual data entry, has contributed to the development and implementation of large-scale RPA in the area of information processing at various organizational levels. Robotic Process Automation applications, as defined by Professor Leslie Willcocks of the London School of Economics, “mimic the work that a person performs in order to perform a task in a process, performing repetitive operations faster, more accurately and on a longer duration than a human can achieve” (Luher, 2016). Thus, data is transferred from email or spreadsheet sources to other processing or recording systems – for example, from the Enterprise Resource Planning (ERP) and Customer Relationship Manager (CRM) category, the ease of such operations leading to widespread absorption of RPA at the level of large companies interested in reducing costs while increasing the quality of services provided and in the shortest possible time (Lacity, Willcocks and Craig, 2015). The relief of human resources from repetitive tasks, consuming energy and at constant risk of inherent errors, thus leads to an increased availability for creative, challenging and value-generating activities.

For a proper understanding of the notion, there are three basic characteristics of RPA that are eloquent for the way these systems interact with data and complement the information systems within organizations:

- ✓ *Imitation of human actions* – similarity with the way the human factor interacts with applications (usual interfaces), collects information, and then uses it by inserting it into other applications or worksheets (Vasarhelyi and Rozario, 2018). Replication of human

operations is done after a prior registration of the targeted processes, thus helping to avoid inherent errors caused by routine (Quinn and Strauss, 2018).

- ✓ *Automation of repetitive processes* – the absence of the decisional or creative component by following a well-defined set of rules, this aspect being partially compensated by Machine Learning algorithms or Artificial Intelligence technologies (Vieira, 2015). Relieving employees of routine and repetitive tasks allows them to engage in more complex and motivating activities, with a direct effect in increasing the level of creativity of the work performed.
- ✓ *Use of existing applications* – use of the usual interfaces, not requiring a complex integration or a special connection for current applications. Interconnectivity with tools such as PDF, MS Excel, ERP, CRM, PowerPoint, etc., as well as HTML pages or email programs contributes to increasing operational efficiency within an organization, in particular by reducing costs (Siderska, 2020).

Thus, RPA systems connected to applications in an organization's information system can move and transmit files, folders, or other types of data, read and interpret emails, complete forms, and manipulate more or less structured data from documents, browsers, or other sources. This non-intrusive interaction with other digital systems allows a complete or at least partial automation of specific human processes or activities with beneficial effect in terms of efficiency or operational productivity (Vasarhelyi and Rozario, 2018).

The literature also notes a number of disadvantages that RPA entails and which are derived, in particular, from the fact that these technologies automate rules-based processes due to lack of cognitive capabilities, exceptional situations being treated by the human factor (Santos, Pereira and Vasconcelos, 2019). This is why the organizations that are interested in automation need to identify, standardize and optimize information flows; these restrictive conditions led to a reformulation of the RPA definition, for example the IEEE Advisory Group studies which concluded that these technologies are "preconfigured software applications that use business rules and predefined choreography to complete autonomous execution of a combination of processes, transactions and tasks in one or more software systems to provide a result or service, taking into account the exceptions addressed by the human factor "(IEEE SA, 2017). The UiPath provider recommends, in the automation approach, organizations to identify the targeted processes, to involve all staff – not only in IT, to apply a progressive automation – from basic to complex processes (www.uipath.com). Selecting the components of a company's activity that will be transformed by automation is a critical factor for the success of RPA and can be achieved in terms of the following criteria (Fung, 2014):

- The processes should be of low complexity and cognitive level;
- Existing applications are maintained;
- Relatively high frequency of processes and tasks considered;
- Increased probability of occurrence of the risk of human error but low of possible exceptional situations.

In the current context of the digital age, however, technologies such as "cloud computing", "artificial intelligence", "machine learning" or "advanced analytics" bring RPA tools to the next level by acting intelligently and proving increased versatility. The combined use of the stated technologies creates opportunities for automation of increasingly complex processes announcing an amplification of the applicability of RPA. The artificial intelligence component accelerates the rate of the learning process by analyzing and processing available data in real time. Moreover, the remaining time for completing a task is calculated while streamlining resources and increasing operational efficiency (Siderska, 2020).

2. Research methodology

The article promotes the idea of automating audit processes by using RPA through a contextual approach to current developments in the field by analyzing articles dedicated to this topic and published in journals or impact databases. At the same time, emphasis is placed on the analysis of the practical area, of the companies directly involved from several points of view:

- *Suppliers of RPA products* – white paper publications, applications offered, fields of application, development trends, etc.;

- *Market research companies* (for example, Gartner, Forrester) – pointing out the main trends, predictions of the development of automation tools in terms of investments or areas of use;
- *Audit firms* – organizations with experience and pioneering in the implementation of RPA in the analysis of financial-accounting information and operating globally, adapted to national legislative standards or standards (mainly companies in the Big Four).

The dynamics of the analyzed field requires a certain rigor of the selection of materials in terms of sources (must be recognized and verifiable), the year of appearance (emphasis on novelty), the relevance of the content (extraction of innovative ideas). Thus, the identification of data sources containing publications relevant to the topic resulted in electronic libraries such as IEEE, Science Direct – Elsevier, SpringerLink and Google Scholar. In addition, the bibliographic resources cited in the content of the articles thus identified were taken into account and the alerts in Google Scholar were necessary to identify, during the writing of this paper, the news published on the subject of RPA. In particular, English-language publications were considered by introducing in the search process expressions such as: "robotic process automation in audit", "cognitive process automation", "intelligent process automation", "artificial intelligence in business process", "tools process automation for audit" or "machine learning in business process". The use of the abbreviation "RPA" has been avoided as the acronym serves a broader terminology, unrelated to the intended processes (for example, Rubin Postaer Associates – advertising agency, Replication Protein A – the main protein that binds to single-stranded DNA in cells eukaryotes, Republican Party of Arkansas / Armenia – political parties etc.).

The main research questions of the study can be summarized as follows:

Q1. What are the current applications for RPA?

Q2. What is the current level of RPA involvement in the audit?

Q3. What are the main dilemmas or challenges for the professional auditor facing the evidence generated by RPA?

Based on the research questions, the criteria for accepting and excluding the relevant articles were established:

Acceptance criteria:

- The publications correspond to the theme of RPA and contribute with answers to the proposed research questions;
- The titles and abstracts contribute to the research idea and contain the terminology stated above ("robotic process automation", "tools process automation for audit" etc.)

Exclusion criteria:

- Publications are not written in English;
- Titles and abstracts do not contribute to the solution of research questions, although they include the terminology according to which the search was performed;
- Repeat ideas or other relevant aspects of the research;
- The extracted publication only compares existing research, without bringing new contributions or ideas.

Both acceptance criteria were taken into account to take over the source of information and if only one exclusion criterion was verified, the article was not included in the research database.

3. Results and discussions

3.1. Applicability of RPA

The areas of application currently identified are varied – human resources, IT, finance, insurance, telecommunications, banking, legal services, real estate or the public sector – and providers bring arguments through case studies (www.uipath.com) and integrate their offer into other available technologies, such as cloud computing – for example IBM Cloud Park (www.ibm.com). Thus, from the analysis of the available offer as well as of the specialized articles, the areas of applicability can be synthesized, as presented in the **Table no. 1**.

Table no. 1. Areas of RPA applicability

Activity field/department	Potential processes for automation	Source of documentation
Human Resources	Employment procedures – CV analysis, payroll – payroll, salary changes, etc., human resources management, professional training, professional performance evaluation.	Hallikainen, Bekkhus and Pan, 2018; Hyun and Lee, 2018; www.uipath.com
IT	System / application installations, email, file synchronization, infrastructure configuration and maintenance, server management, back-up security, FTP access.	Hyun and Lee, 2018; Khramov, 2018; www.uipath.com
Finance, banks	Financial-accounting records, fixed assets accounting, loan repayment charts, information on customer creditworthiness, online sales, client services.	Chakraborti, 2020; Hyun and Lee, 2018; Lacity, Willcocks and Craig 2017; www.uipath.com
Telecommunications	Data management – security and integrity, development of new innovative services, operational agility, back-office operational flow, customer support services.	Lacity, Willcocks and Craig, 2017; www.uipath.com
Legal services	Case management, deadline management, updating legislative changes and jurisprudence.	Holder et al., 2016; www.mitratech.com www.uipath.com
Insurance	Back-office processes, support services, online sales, registration and processing of statements / appeals, risk assessment, compliance with regulations.	Lacity, Willcocks and Craig, 2017; Makadia, 2020
Public services	Connecting to applications, moving files and folders, accessing databases, collecting data from the web, connecting existing systems, processing forms across departments.	www.uipath.com www.deloitte.com

Source: Authors' projections, 2021

Regardless of the sector, public or private, the motivation for implementing the RPA is given by the increase of productivity and operational efficiency. By their nature, these process automation tools are justified within organizations with complex activities, consistent information volumes, extended geographical area as well as with numerous staff in services and support and logistics departments. Investments in RPA generate quantifiable benefits such as:

- Reducing the processing time of repetitive tasks;
- Decreased error rate;
- Satisfactory Return on investment (ROI);
- Reduction of operational costs.

In addition to the work scenarios offered by RPA providers, eloquent for the profitability of RPA are case studies conducted in private companies or public services / government authorities. Thus, one of the largest financial groups in Latin America, Bancolombia has implemented RPA technologies in order to transform the operating methodology in the 12 countries where the holding is present, resulting: increasing by 50% the efficiency of customer support services, cutting 127 thousand of working hours annually in branches, investment return of 1300% (www.automationeverywhere.com). In the area of public services, the largest government department in the UK, the Department of Labor and Pensions, responsible for a budget of approximately £ 177 billion, has opted to automate specific processes since 2017 by implementing 50 robots; The key benefits, according to a UiPath report, were: 30,000 pension applications processed in 2 weeks, 15:1 return on investment (www.uipath.com).

In Romania, the Ministry of Finance announced in July 2021 the agreement with UiPath for the implementation of the RPA Center of Excellence with the stated purpose of reducing the waiting time for tax information requests from taxpayers and increase security of the processed data (www.mfinante.gov.ro).

The results obtained as well as the transition of RPA technologies from the classic version of data collection, from "screen scraping" to the cognitive version with AI component outlines an upward trend in the volume of investments in process automation but also a diversification of application areas. According to a Gartner report conducted in 2020, the RPA market is the segment with one of the fastest growth in the area of software products: 63.1% in 2018 and 62.9% in 2019, compared to 13.5% and 11, respectively, 5% representing total market developments (www.gartner.com). At the same time, due to the COVID-19 panic and, implicitly, of the global recession, the same study estimates an acceleration of the insertion of RPA solutions to support remote work, of the digitization of physical / paper operations. The losses registered by the companies, during this period, determined a pressing need to reduce the expenses by automating the processes and by reducing the number of employees involved in performing redundant tasks. Thus, the April 2021 Grand View Research report notes an increase in RPA adoption trends among small and medium-sized companies and a profile market size of $ 13.74 billion in 2028 (www.grandviewresearch.com).

3.2. Involvement of RPA in audit procedures

In the current context of process automation within private organizations but also in the field of public services, the audit is required to have a proactive attitude and to meet the new procedures of information processing, reporting and, last but not least, evidence audit. As audited clients implement intelligent information technologies to increase business efficiency, focus on customers, find new markets, increase productivity, the auditor must understand the impact of digitalization on the business and apply such technologies in their work missions (Meuldijk, 2017). A 2017 KPMG report published in Audit Committee News insists on the need to define a "digital strategy" by implementing a culture of innovation, by adopting training programs for the acquisition of technological skills and even by rethinking the whole profession in the light of new realities.

In a study conducted in 2017 by Ernst & Young on a number of 745 respondents from 19 countries having a leading role in organizations that hold Forensic Data Analytics tools, the results indicate an overwhelming percentage in favor tools in the Spreadsheet category (90%). The sophisticated instruments from the RPA or Voice Search and Analysis category are expected to be adopted in much smaller shares by those interviewed, as can be seen in **Table no. 2**. At the same time, a high percentage is registered by the instruments designed within the beneficiary entities, to the detriment of the solutions marketed by companies specialized in the area of data processing.

Table no. 2. Advanced technologies implementation levels

Technologies	Percent
Spreadsheets and relational databases	90%
Data Warehouses	63%
Internally designed tools	55%
Data Visualization and Reports	54%
Continuous monitoring	46%
Incidents/security events Management	43%
Statistical analysis and Data Mining	42%
Social media and web monitoring	40%
Fraud detection	33%
Robotic Process Automation (RPA)	14%
Voice Detection and Analysis	8%

Source: https://www.eycom.ch/en/Publications/20181203-Global-Forensic-Data-Analytics-Survey-2018

Under these circumstances, an analysis is required on some practical examples in which the automation of financial-accounting information processing impacts the audit procedures, on the degree of acceptance of the results from the digitization of data collection flows. Thus, the Dutch company Mechan Groep, which is one of the world leaders in the supply of components for agricultural machinery, faced the need to streamline the management of invoices received from partners, from the entry of documents in the company to payment acceptance.

According to the case study available on the RPA NTT Data provider's website, the possible solutions to handle the approximately 15,000 invoices received annually were either to hire additional staff or to implement a system to automate specific procedures. The complexity of the operations that presented a high risk of error or fraud as well as the urgent need to reduce costs determined the organization to opt, in 2017, for automation solutions for the entire process. In the new configuration, the company's provider sends the invoice as a simple email attachment, from which time the intelligent software handles the entire administrative process required until the time of payment. The time required to process the invoices received was thus reduced by up to 60%, errors specific to manual and repetitive activities were eliminated and no additional costs were incurred with license fees or software updates. In this example, from the point of view of the company's management or shareholders, things are great: costs have been reduced, existing staff have been relieved of redundant tasks and focused on strengthening the database, the relationship with partners, productivity has increased and the risks of error or fraud have disappeared by removing the human factor from the process. From the point of view of an external audit, however, the changes made have a different perspective:

- ✓ Invoices reach payment level directly, without confirmations in physical form (signatures, reports, payment orders, etc.) from the responsible factors;
- ✓ There are no documents referring to contracts, negotiation minutes, rescheduling agreements for payment, VAT exemptions, etc.;
- ✓ The reports that the operational management receives are not always saved or printed;
- ✓ Difficulties may arise in monitoring cash flow, in correlating with the financial resources available at a given time or in forecasting a cash evolution.

On the operational flow of acquisitions and payments, the auditor can verify that there are controls and that they are fully complied with. As a result, the risks that can be identified and assessed are: fraud risk, overestimation of income / underestimation of expenses, separation of financial years, erroneous recording of reversals, inability to pay, underestimation of debts. In the present example, by reference to ISA Standard 315 – Risk Identification and Assessment, Due to Emerging Technologies Implemented in the Client Entity's IT System, "the auditor's responsibilities in relation to IT applications and general controls of IT systems (...) remain unchanged" (www.iaasb.org). In conclusion, although the standard recognizes the importance of smart automation in terms of increasing operational efficiency and improving financial reporting, the auditor should consider, in such situations, the associated risks of using IT.

On the other hand, large audit firms, especially those in the Big Four, have adopted RPA technologies in their own procedures as they carry out operations specific to the human factor with a much higher efficiency (Rozario et al., 2019). Worksheet digitization techniques or profile IT applications (for example, IDEA, ACL) are already widely known and applied, and these tools are involved in separate stages of a mission.

The RPA creates the premises for an intelligent approach to the whole process if a series of preparatory operations are carried out (Moffit, Rozario and Vasarhelyi, 2018):

- creation of a joint work team composed of representatives of the audit firm, of the RPA provider to which consultants or representatives of the academic environment can be added;
- identifying the audit stages / processes that are repetitive, well-defined, time-consuming and significant human resources tasks;
- breaking the audit procedures identified in modules / sub-activities;
- identifying the modules / sub-activities that are suitable for automation (must be structured, available or digitally transformable);
- standardizing data obtained from different sources and with different attributes;
- selecting modules for which RPA automation is considered feasible;
- designing a prototype (an RPA tool / combination) and experimenting with it in concrete work scenarios;
- final evaluation and centralization of feedback from the system – analysis of 3 main indicators: *speed* (comparison of automated process vs. manual), *quality* (percentage of errors), *degree of automation* (number of human interventions).

From a similar perspective, Griffiths and Pretorius (2021) emphasize the prior preparation of data and processes but bring to the fore the importance of sizing the desired results through RPA. A clear picture of the purpose, objectives and role of automation in the future configuration of work procedures is considered essential

for the success of such a project. In addition to the necessary external expertise, the own staff training is considered to be a critical factor in the correct management of RPA instruments through professional training in the field of audit and IT. At the same time, the realistic assessment of possible weaknesses or risks of automation must be considered from the design stage in order to come up with alternative solutions to ensure the continuity of the audit mission.

According to a report by the Public Company Accounting Oversight Board (PCAOB) – the statutory audit body in the United States – since September 2020, large firms have experience in the field of intelligent audit applications and give the start signal for the inclusion of emerging technologies – e.g. : KPMG uses IBM Watson in the analysis of credit bank files in commercial loan portfolios, and Ernst & Young involves machine-learning technologies to detect billing anomalies and to identify fraud with 97% accuracy (www.pcaobus.org). Deloitte indicates RPA as a basic tool in testing samples by connecting documents and including data obtained in its own analyzes. Automation is extended to performing calculations, extracting structured data from documents, filling in specific forms or preparing basic materials for reports (www2.deloitte.com). Analyzing the approach of RPA by the audit companies from the Big Four structure, three directions of action are observed:

– *auditing the RPA within the client entities* – there is the necessary expertise to analyze data or reports obtained through automation as well as the appropriate own tools for controlling the audited procedures;
– *auditing through RPA* – cabinets have their own technologies for automating mission-specific work tasks and invest in perfecting these tools;
– *RPA expertize and consultancy* – addresses companies interested in automation related to the evaluation of processes that are suitable for such a transformation and recommends solutions. This is the reason why partnerships are concluded with RPA providers (for example, KPMG Romania agreement with UiPath, 2020).

3.3. RPA dilemmas for auditors

Although RPA technologies have a proven potential in the processes of analysis and collection of financial-accounting data, in general, and in auditing in particular, the literature concerned with this topic as well as the practice in the field retain a number of conditions, challenges or risks related to:

- investment budget;
- specific audit regulations;
- human resources.

Regarding *the budget required* for such an investment, the most accessible option for small companies is in the "cloud", in which case the offers are presented differently, depending on a series of technical or purely commercial conditions (**Table no. 3**).

Table no. 3. Comparative analysis regarding RPA prices

Supplier	Price	Details
UiPath	3.990 USD/year	1 user, starting price
AutomationAnywhere	750 USD/month	1 user, 12 months contract
IBM	840 USD/month	Starting price
Microsoft Power Automate	500 USD/month	Price for five flows/month

Source: www.uipath.com, www.automationanywhere.com, www.ibm.com, www.flow.microsoft.com

The rates are indicative, each offer being customized according to several factors such as: company size – implicitly the number of users, the degree of involvement of the artificial intelligence component, maintenance and periodic reassessments or the number of robots required. As this is an investment of thousands of USD per year, the decision to opt for such a solution must be very well-founded, especially if it is a small and medium-sized company. The return on investment can take years and audit firms with a modest turnover may fail to benefit from such tools. In predicting the total budgetary effort of such products, in addition to the actual purchase, the subsequent costs of maintenance / "upgrade", training of own staff, management and scaling of automated processes, etc. must be taken into account (Jedrzejka, 2019). On the other hand, the competitive pressure, the

accentuated spread of the innovative methods of financial-accounting data processing, as well as the need for efficiency oblige to a minimum of digitization of the procedures (George, 2018).

Large audit firms have directed substantial investments in the acquisition or development of digital instruments. Ernst & Young has committed $ 400 million to the development of audit technologies, and KPMG has announced plans to invest $ 100 million in partnerships with companies specializing in the development of such systems.

From the *audit regulation* point of view, current standards do not limit the use of automation tools, but the lack of text reference to these technologies may inhibit the adoption of such solutions; although, according to the *Institute of Certified Financial Analysts* (CFA), some standardized procedures may seem redundant in terms of intelligent data analysis, "the aim is to find ways to reference such technologies in the ISA without leading to block changes that would have undesirable consequences". An edifying example of this is the revision of ISA Standard 315 "Knowledge of the entity and its environment and knowledge of the risks of material misstatement" – which provides a more accurate and broader risk identification as well as an improvement and clarification of requirements and application material. In Annex 5, the standard recognizes emerging technologies (blockchain, software robots, artificial intelligence, etc.) applied in the information systems of the analyzed entities as possible working tools in the preparation of financial statements. At the same time, the sources of risk associated with IT systems are identified for audit depending on their complexity (**Table no. 4**).

Table no. 4. Risks derived from IT systems implemented within client entities

Characteristics of a risk-free IT application	Characteristics of a high-risk IT application
- standalone applications; - insignificant volume of data or transactions; - functionality of a reduced complexity of the application; - each transaction is based on physical documentation.	- applications are interfaced; - the volume of data or transactions is significant; - complex functionality of the application in the sense that it automatically initiates transactions and there are a variety of complex calculations that underlie the automated entries.
The IT application does not pose a risk for the following reasons: - insignificant volume of data, which is why management does not rely on IT in data processing or management; - management is not based on automated controls or other automated functionalities. The auditor did not identify automated controls as required by the standard; - although the management uses in the control activity reports generated by the system, it does not rely on these reports. These are reconciled with physical documentation and the calculations in the reports are verified; - the auditor will directly test the information generated by the organization used as audit evidence.	The IT application carries a certain degree of risk for the following reasons: - management relies on the application in the system to process and manage significant volumes of data; - the management is based on the application in the system in order to perform certain automated identified and audit controls.

Source: IFAC 2019, https://www.ifac.org/system/files/publications/files/ISA-315-Full-Standard-and-Conforming-Amendments-2019-.pdf

If the emerging technologies implemented in the audited entity's information system are above the usual or already known ones, the auditor has the same responsibilities regarding the identification of the risks generated by IT. The task of the professional involved in the analysis of such electronic systems for processing and generating financial-accounting information thus becomes complex if not complicated, given the expertise required in this case.

The Public Company Accounting Oversight Board (PCAOB) of the United States, in a report issued in February 2020, notes the adoption of intelligent working tools in the field of practical audit procedures, aspect encouraged, in their view, by the permissiveness of PCAOB standards in this regard. However, the lack of mention of these technologies in the text raises the issue of an assessment or revision of regulatory acts based on:

- Assessing changes in the use of technology in auditing and financial reporting;
- Understanding how new technologies are involved in identifying the risks of significant distortions;
- Analysis of how the specific requirements of the PCAOB standards are applied;

– Collaboration with other bodies with a regulatory role or to implement standards in the field.

The PCAOB report on the reactions of audit committees in approximately 400 entities inspected in the United States during 2019 notes skepticism about the adoption of emerging technologies in auditing. It is still unclear, in the opinion of these committees, whether these instruments have a positive impact on the quality of the audit, or on the contrary, bring a number of shortcomings (Dwyer, 2020).

From the perspective of human resources, the implementation of RPA creates, first of all, barriers determined by the organizational culture. Robots that replace human labor can become a demoralizing reality for a company's staff. At the same time, the lack of qualification and experience in the field complicates the automation process, if there are no mixed teams of specialists involved from the early stages of design and implementation (Jedrzejka, 2019). Reported to auditors, RPA involvement takes on specific nuances as tasks strictly related to professional judgment are difficult to automate. However, given that professional skepticism, for example, is the ability by which an audit determines whether an accounting treatment or a client's behavior is reasonable, the help provided by automation technology must play a complementary role in carrying out a mission (Cohen, 2019).

A 2018 World Economic Forum report shows that routine-based activities, which require average training, accountants, payroll officials and auditors will be less sought after in the future (The Future Jobs, 2018). The ACCA (*Association of Chartered Certified Accountants*) study, conducted in 2020 on the future configuration of the labor market, shows a trend of reinventing jobs in which the human factor combines traditional methods with new technologies that will have a significant involvement in the next three years, giving a digital and multi-disciplinary character to the positions in the sphere of financial-accounting processing (ACCA, 2020). Changes brought about by Artificial Intelligence, cognitive tools or RPA are seen as opportunities to resettle the contribution of the human factor, by relieving repetitive, time-consuming operations, leaving room for creativity, professional reasoning or even the involvement of a sensitive or specific human side. Of course, all the changes that are foreshadowed can negatively impact the perception on the new digitization tools for several reasons: fear of unemployment, insufficient training, incomplete information on smart technologies, etc. The fear that software robots will replace human positions is also fueled by the fact that one of the key performance indicators of RPA is the number of hours saved per month or the number of work rules replaced by automation (Moffit, Rozario and Vasarhelyi, 2018). That is why the current offers, reports or guides of the providers of such technologies avoid phrases that suggest the replacement of the human factor by RPA and insist on the advantages that these tools confer by streamlining the usual operations.

Viewed from the perspective of the auditor profession, automation creates a risk of de-professionalization by imposing new reasoning, auditors being forced to think like computer scientists, reaching situations of including data analysts in audit engagements or even replacing auditors with applications intelligent information processing (Munoko and Brown-Liburd, 2019). Under such conditions, the maintenance of critical thinking and professional skepticism must come from an intrinsic motivation cultivated by adequate professional training to encourage automation as a tool of control and support in work procedures. In order to be prepared for the new foreshadowing of the profession, auditors must be proactive, open to process innovation, and acquire new skills from which, in a recent study, Ernst & Young names: data analysis (visualization, programming logic, analytical modeling), personal skills (resilience, communication, agility), critical thinking, understanding and application of disruptive technologies (RPA, IA, Blockchain, etc.) (Rozario, Zhang and Vasarhelyi, 2019).

Conclusions

The paper reviewed a number of theoretical and practical issues regarding the definition, role and particularities of RPA instruments and insisted on the implications they have on audit missions. The basic idea, generally accepted, is that automation relieves staff of redundant, time-consuming and error-prone activities, in order to streamline operational efficiency and encourage creativity, professional reasoning. From the analysis of practical examples and reports issued by suppliers or audit firms, a number of particularities of the moment emerge, such as:

✓ at the current stage, it is recommended to automate the operations identified as standardized and based on rules; although the involvement of artificial intelligence in RPA is configured, with the "IPA (Intelligent Process Automation)" format expected, emphasis is placed on

human expertise in dealing with exceptions and situations that require professional judgment;

- ✓ software robots are seen as a link between the other information systems of the organization (ERP, CRM, etc.), non-intrusiveness being appreciated;
- ✓ the available case studies denote an appreciable success rate in the case of organizations with complex activity and significant information volumes in which automation leads to a rapid amortization of the investment;
- ✓ the public sector is emerging as an important beneficiary, being interested in reducing costs and streamlining the fiscal apparatus;
- ✓ the introduction of RPA in the financial-accounting flows changes the traditional circuit of documents, complicating the possible external audit missions.

Although the digitization of the processes of analysis or monitoring of financial-accounting data has a remarkable progress in the light of the new available technologies, the potentiation of the audit through innovation depends on a series of factors that require a detailed analysis and a permanent reporting to the context. Excessive technologizing in recent years with a direct impact on the ways of processing, collecting or storing data has created a "mined" ground for the auditor because, in addition to the need for information, training and investment in emerging technologies, legal frames are needed – additional or adapted to current information flows. The revisions already proposed or implemented bring a beneficial support in the audit work and open the way to a necessary but cautious flexibility of the methodologies applied in the work missions, in the spirit of the fundamental principles of the profession. Emerging technologies applied in the customer organization's information system are risk-generating and should be treated as such, as suggested by ISA 315.

Replacing the human factor in certain categories of operations leads to a number of different approaches, depending on the end-user's position:

- ✓ replaced human operators in carrying out routine and repetitive processes that require average training – show an attitude of resilience, skepticism, fears related to the prospect of unemployment or the need for professional retraining;
- ✓ company management / shareholders – concerned with the return on investment in RPA, can allocate a budget to expand automation to other sectors;
- ✓ highly qualified staff (e.g. auditors) – is relieved of redundant, time-consuming tasks and is more involved in professional reasoning, opinion forms, etc., but needs new skills in data analysis or use of new tools computer science.

In addition to the obvious benefits of RPA, a good part of the studied literature warns about the risk of de-professionalization of auditors and insists on the role of support and complementarity of these tools in carrying out missions. Similar to other fields of activity, automation remains the prerogative of large audit firms that have the financial, logistical and "know-how" resources needed to invest not only in the actual acquisition of software but also in the qualification of available staff or in the recruitment of specialists with multi-disciplinary skills.

Assessing the findings presented and taking into account the current information complexity, it can be stated that the audit now has working tools at its disposal to ensure effective monitoring of transactions in which an entity may be involved. The financial auditors can carry out their specific operations throughout the year or financial year, thus being able to identify in advance the important aspects that may lead to the timely modification of the audit plan. At the same time, audit services reach a higher level of quality through continuous reporting due to the capabilities offered by the web; the financial information becomes permanently available thus replacing the periodic situations and the audit assurance can acquire the continuity much desired by the interested users. It remains to be seen to what extent the procedural or legislative dilemmas and obstacles analyzed in this paper will be addressed through the direct involvement of regulatory bodies, as well as practitioners with a growing interest in reinventing financial-accounting analysis tools.

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