

The Impact Regarding the Use of Robotic Process Automation and Artificial Intelligence in Accounting Services Industry

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Abstract. *The provision of accounting services has significantly changed over the years and digital technologies have revolutionized the accounting profession. Today cloud technology, robotic process automation and artificial intelligence can support accounting firms to streamline their delivery of services. This study investigates the impact of using the robotic process automation and artificial intelligence technologies in accounting industry. We mobilized technology acceptance model as theoretical framework. Our data was collected having in view the posts made by accountants on two social media groups in the last five years. Considering the technology acceptance model, accounting firms implemented robotic process automation and artificial intelligence to stay competitive under the influence of the business environment, development of technologies, perceptions on usefulness and ease of use. Our results showed that accounting firms take seriously into account the critical statement “digitalize or die”. As regards task performance, robotic process automation facilitates the exchange of data between information systems, processing of invoices and bank statements and reconciliation of transactions. Most accountants emphasized that artificial intelligence need human oversight and is used in accounting for compliance and business advice purposes, whereas in audit is used for analyzing vast datasets to identify risks, patterns and trends. We found that robotic process automation and artificial intelligence can replace the human efforts in many areas of work and they are intended to enhance the accountants’ capabilities. The impact of using these two technologies in accounting industry relates to labor cost savings, higher productivity, service diversification, the possibility to accommodate more clients, job transformation, overcoming the shortage of professionals, prompt service delivery, improved service quality and elevating the client’s satisfaction level. Our research has implications for accounting firms, practitioners and future professionals and our main contribution was to present the impact regarding the application of these two technologies in accounting industry.*

Keywords: accounting firms, digitalization, robotic process automation, artificial intelligence, cloud technology, technology acceptance model.

Introduction

Accounting profession has always adapted very well and quickly to the major technology advances since it perceived all the changes as opportunities to evolve, stay competitive and serve better the clients. Cloud technology, robotic process automation (RPA) and artificial intelligence (AI) are the most used technologies by accounting firms to streamline their delivery of services.

The implementation of RPA and AI technologies does not significantly change the main role of external accountants in supporting their clients to manage the business and to comply with statutory requirements. The adoption of RPA and AI technologies only changes the working practices in accounting by making the service provision easier and faster, but the responsibility of accountants remains the same as ever.

Digitalization reshapes the business models and controlling practices, enhances the exchange of data between the companies, comes with benefits such as automation of routine tasks,

data analytics, remote collaboration and creates new opportunities for outsourcing of accounting services (Rezazade et al., 2023; Möller et al., 2020).

In digital age the users of accounting information, especially managers expect to have access to information in real-time in order to make prompt decisions and timely interventions and because of that accounting function is digitalized in a faster pace and in a higher proportion compared to other business functions (Yigitbasioglu et al., 2023; Gulin et al., 2019).

Cloud technology facilitates remote delivery of services, real-time collaboration and immediate access to data (Ma et al., 2021; Asatiani et al., 2019). Prior studies on RPA technology indicated that automation is suitable for accounting field which involves a wide range of routine tasks and the implementation of software robots ensures faster and continuous data processing and it supports the transition of accountants from bookkeepers to advisors (Cooper et al. 2022; Januszewski et al., 2021; Harrast, 2020)

In respect to the use of AI technology, Han et al. (2023) mentioned that with the support of this technology, accountants can provide reliable information and valuable insights to managers and that is expected to increase the business performance.

Even though in the last two decades the collaboration between humans and machines intensified and now there are some applications that automate the decision-making process in end the accountability for decisions made should fall on individuals (Lehner et al., 2022). This idea is reinforced by Hasan (2022) who indicated that AI technology is very helpful for analyzing large datasets but it cannot replace the experience and the expertise of professionals.

Nowadays accounting industry faces many challenges primarily related to the shortage of accountants and in the reports prepared by professional bodies ACCA (2023) and IFAC (2024) there are serious concerns about the declining number of accountants.

After reviewing the available literature on the use of RPA and AI technologies, we discovered that there is a lack of papers investigating the impact of these technologies on accounting services industry based on the opinions shared by practitioners over time on social media groups and considering the Romanian business context.

The aim of this paper is to study the impact related to the use of RPA and AI technologies in accounting industry considering the accountants' response towards the adoption of these technologies and the effects of using RPA and AI technologies for accounting firms by exploring multiple perspectives.

We employed a qualitative approach by using technology acceptance model as theoretical framework, accounting services market from Romania as research context and we performed a thematic analysis on a number of 3,897 posts with reference to digitalization, automation and artificial intelligence created by accountants on two social media groups (Accountants on Facebook and Tax advisors' group) in the last five years.

Having in view the technology acceptance model, accounting firms implemented RPA and AI technologies to stay competitive under the influence of the business environment, development of technologies, perceptions on usefulness and ease of use.

During the last five years the main discussions between practitioners gravitated year by year around topics such as digitalization, artificial intelligence and automation. Most posts were created in the last two years and that indicates an increase in the importance and in the necessity to digitalize the accounting services and to implement RPA and AI technologies. Our results showed that accounting firms take seriously into account the critical statement "digitalize or die".

RPA technology facilitates the exchange of data between information systems, processing of invoices and bank statements and reconciliation of transactions. Most accountants emphasized that AI technology needs human oversight and is used in accounting for compliance and business advice purposes, whereas in audit is used for analyzing vast datasets to identify risks, patterns and trends.

We found that RPA and AI technologies can replace the human efforts in many areas of work and they are intended to enhance the accountants' capabilities. The impact of using these two technologies in accounting industry relates to labor cost savings, higher productivity, service diversification, the possibility to accommodate more clients, job transformation, overcoming the shortage of professionals, prompt service delivery, improved service quality and elevating the client's satisfaction level.

Our paper is structured in four parts. In the first section we reviewed the relevant literature and we introduced our theoretical framework. The second part reveals the aim of this paper, our research context, the research methods and the research questions. In third section we focused on answering the research questions and we discussed our findings referring also to prior research. The final part emphasizes the main conclusions, our contributions, the implications and the limitations of this study and we presented some directions for future research.

Literature review

Background literature

Accounting profession has the mission to serve the public interest and it has proved its adaptability to change, since over time accounting practices have experienced many adjustments in response to the development of new technologies in order to meet the evolving needs of the business environment and society (Al-Adeem, 2023).

In most cases, small and medium-sized enterprises choose to outsource their accounting services due to a lack of skilled internal accountants or having other motivations such as cost reduction (Rezazade et al., 2023).

Digitalization reshapes the business models and controlling practices and with regard to accounting function it involves the automation of routine tasks and the adoption of business intelligence and data analytics (Möller et al., 2020).

In digital age the users of accounting information, especially managers expect to have access to information in real-time in order to make prompt decisions and timely interventions and because of that accounting function is digitalized in a faster pace and in a higher proportion compared to other business functions (Yigitbasioglu et al., 2023; Gulin et al., 2019).

Cloud technology made the enterprises to be more open towards the option of outsourcing the accounting services, since this technology removes the physical location constraints, holds real-time collaboration functionalities, provides enhanced data processing capabilities and ensures immediate access to information (Ma et al., 2021; Asatiani et al., 2019).

When it comes to the risks associated with the use of cloud technology there are authors like Tchernykh et al. (2019) and Yau-Yeung et al. (2020) who wrote about the confidentiality, integrity and availability risks in their papers.

In his paper on RPA technology and accounting systems, Harrast (2020) specified that the work of accountants was significantly transformed since those processes related to data collection and data processing that took before most of the accountants' working time were automated by

implementing software robots and in the near future those data entry jobs will become obsolete and will disappear.

According to Cooper et al. (2022), large accounting firms already implemented RPA technology since this technology is suitable for the accounting field which involves a wide range of routine tasks and large amount of data. In their study, Januszewski et al. (2021) emphasized that software robots are appropriate for those repetitive tasks that use digital inputs and they are able to operate without interruptions 24 hours a day and 7 days a week and they process data faster and are expected to make fewer errors than individuals.

There are also papers dealing with the application of RPA in audit and those authors indicated that labor-intensive and repetitive audit tasks related to confirmation, reconciliation, tests of internal controls and tests of details are good candidates for automation and because of that auditors can focus more on those activities that require a higher level of professional judgment (Huang & Vasarhelyi, 2019).

On the subject of artificial intelligence (AI), Hasan (2022) mentioned that this technology simulates the human intelligence related to learning, problem solving and decision making. In his opinion even though AI is helpful to find risks, identify patterns in data, reveal trends based on large datasets, this technology cannot replace the experience and the expertise of professionals.

According to Zhang et al. (2020) there are audit companies that use AI powered applications to detect errors, unusual, suspicious or fraudulent transactions by analyzing the general ledger of their clients.

In their study on the use of artificial intelligence for making decisions, authors like Lehner et al. (2022) argued that in the last two decades the collaboration between humans and machines intensified and even though there are some applications that automate the decision-making process in end the accountability for decisions made should fall on humans.

Regarding artificial intelligence and information reliability, Han et al. (2023) specified that the use of AI can improve the internal control systems, produce more accurate and reliable information, help managers to make better decisions and increase the business performance. In addition to that, these authors argued that the application of AI in audit leads to an increase in the audit quality by reducing the control and detection risks.

Some researchers (Perdana et al., 2023; Gotthardt et al., 2020) emphasized that technologies like optical character recognition (OCR), RPA and AI are complementary and they are meant to revolutionize accounting and audit services. In their studies there are explanations on how these technologies work together and the authors emphasized that OCR is in charge with data extraction, RPA with data processing and AI with data analysis.

There are reports dealing with the development of accounting profession prepared by professional bodies such as IFAC (2024) and in a recent paper written by Reinstein and Kaszak (2024) are raised concerns regarding the shortage of accountants on the labor market caused by the retirement of old accountants, transition of young accountants to other related professions and the declining interest of the students in joining accounting faculties. In order to attract and retain talent, accounting industry should prioritize the wellbeing of their employees by considering these three key aspects such as work-life balance, fair remuneration and the adoption of digital technologies (ACCA, 2023).

After reviewing the available literature on the use of RPA and AI technologies, we discovered that there is a lack of papers investigating the impact of these technologies on accounting services industry based on the opinions shared by practitioners over time on social

media groups and considering the Romanian business context.

Theoretical framework

Technology acceptance model (TAM) explains how people and organizations accept and use technology. According to Davis et al. (1989) the actual use of technology is influenced by the behavioral intention to use the technology and the behavioral intention is determined in its turn by the attitude towards using the technology which represents the general impression on technology.

These authors claimed that the attitude towards using the technology is shaped by the perceptions on usefulness and ease of use and these two perceptions are influenced by other factors such as social influence, development of technologies, facilitating conditions and previous exposure or experience with technology

Perceived usefulness is related to beliefs that the use of the new technology will increase the work performance and perceived ease of use is related to the expectations that the use of the new technology will require lower efforts and the work satisfaction will be higher and the positive attitude among the users are more likely to make them embrace the use of the new technology (Davis et al., 1989)

Technology acceptance model was used in prior research for investigating the adoption of cloud computing (Asadi et al., 2017), for studying the implementation of big data analytics (Verma et al., 2018) and for explaining the acceptance of robotic process automation (Tschandl et al., 2021)

Methodology

Research context

The purpose of this paper is to study the impact related to the use of RPA and AI technologies in accounting industry and we had in view the accounting services market from Romania as research context. For the year 2023, the business environment from Romania counted over 1 million active enterprises and the companies having less than 50 employees represented 99.1% of total enterprises and these businesses employed 62.1% of total workforce and they achieved 37.2% of total turnover (Eurostat, 2024).

For the same period, accounting industry encompassed 12,365 active enterprises and the companies having less than 50 employees represented 99.8% of all accounting firms and these entities employed 81.3% of total workforce within the industry and they reached a market share of 63.3% (Eurostat, 2024).

These characteristics of the business environment from Romania create many opportunities especially for those enterprises having less than 50 employees and accounting firms to collaborate on a regular basis as regards the sourcing of accounting services. As a consequence of that, small accounting firms serve mostly small companies and these entities represent their main category of clients. In order to have a better overview of the business environment from Romania we provided in the Tables 1 and 2 more details regarding the active accounting firms and the other active enterprises.

Table 1. The active accounting firms from Romania in the year 2023

Category of enterprise	No of companies	No of employees	Annual turnover (mil. EUR)
Companies with less than 10 employees	12,179	19,573	574.3
Companies having between 10-50 employees	158	2,765	160.4
Companies with more than 50 employees	28	5,135	426.5
Total	12,365	27,473	1,161.2

Source: Own processed information based on Eurostat database (<https://ec.europa.eu/eurostat>).

Table 2. The active enterprises from Romania in the year 2023 (excluding accounting firms)

Category of enterprise	No of companies	No of employees	Annual turnover (mil. EUR)
Companies with less than 10 employees	955,546	1,556,868	100,582.4
Companies having between 10-50 employees	47,005	921,670	101,947.2
Companies with more than 50 employees	9,556	1,513,655	341,551.7
Total	1,012,107	3,992,193	544,081.3

Source: Own processed information based on Eurostat database (<https://ec.europa.eu/eurostat>).

Research design

Considering the nature and the novelty of our research topic, we decided to collect our data based on the posts created by accountants on two social media groups in order to reach as many individuals as possible following the suggestion made by Sharma et al. (2022).

In accounting research, social media represents unconventional or innovative data sources which provide a huge volume of data in form of the posts created by the members and because of that, researchers can explore multiple and recent opinions and extract meaningful insights (Debreceeny et al., 2019; Teoh, 2018).

In prior accounting research, social media was used as data source by Saxton et al. (2019) to investigate the people's reactions to corporate social responsibility (CSR) disclosures, by Sharma et al. (2022) to study the users' perspectives on the adoption of mobile banking and then by Kimmons et al. (2021) to explore the people's opinions on digital technologies used in education.

Having in view the aim of this paper we intend to answer the following two research questions:

- RQ1. How are accountants relating to the adoption of robotic process automation and artificial intelligence technologies?
- RQ2. How is accounting industry impacted by the use of robotic process automation and artificial intelligence technologies?

For data collection purposes, we visited the social media groups called "Accountants on Facebook" having more than 50,000 members and "Tax advisors' group" having more than 45,000 members. The members of these two social media groups are represented by practitioners in accounting, taxation and audit. In order to find the relevant posts created by members we applied step by step three search filters containing the words "digitalization", "automation" and "artificial intelligence" in Romanian language.

We identified 3,897 relevant posts created by practitioners on robotic process automation and artificial intelligence in the last five years namely the period between 2020 and 2024 and we employed a thematic analysis method for identifying, analyzing, and reporting patterns or themes within data (Braun & Clarke, 2006).

We followed the framework proposed by Braun and Clarke (2006) consisting in six steps such as: (1) becoming familiar with data by reading the posts multiple times, (2) creating the initial codes, (3) searching for themes, (4) reviewing the themes, (5) refining the themes and (6) reporting the results.

Through thematic analysis we found various patterns in the posts created by practitioners and the most prominent pattern was related to opinions of accountants, indicating that RPA and AI technologies are useful, ease to use, make their work experience more pleasant and help them save time and considering that we chose technology acceptance model as our theoretical framework.

Results and discussions

We presented the results of our research around the chosen theoretical framework consisting in the technology acceptance model and we discussed our findings referring also to prior studies showing similarities, differences and our own contributions.

Our narratives were constructed based on the themes of the research questions represented by the accountants' response towards the adoption of RPA and AI technologies and the impact of using these technologies in accounting industry.

Explaining the adoption and the use of RPA and AI technologies in accounting

Following our theoretical framework represented by the technology acceptance model, accounting firms implemented RPA and AI technologies under the influence of the business environment (competitors and clients), development of technologies, previous experience of staff with technology, perceptions on the ease of use and the usefulness and all of these determined the attitude of accountants and their behavioral intention to use RPA and AI technologies and further the actual use of these technologies in carrying out their tasks.

For a better overview we made a graphical representation in the Figure 1 regarding the factors that influence the acceptance of accountants to use RPA and AI technologies.

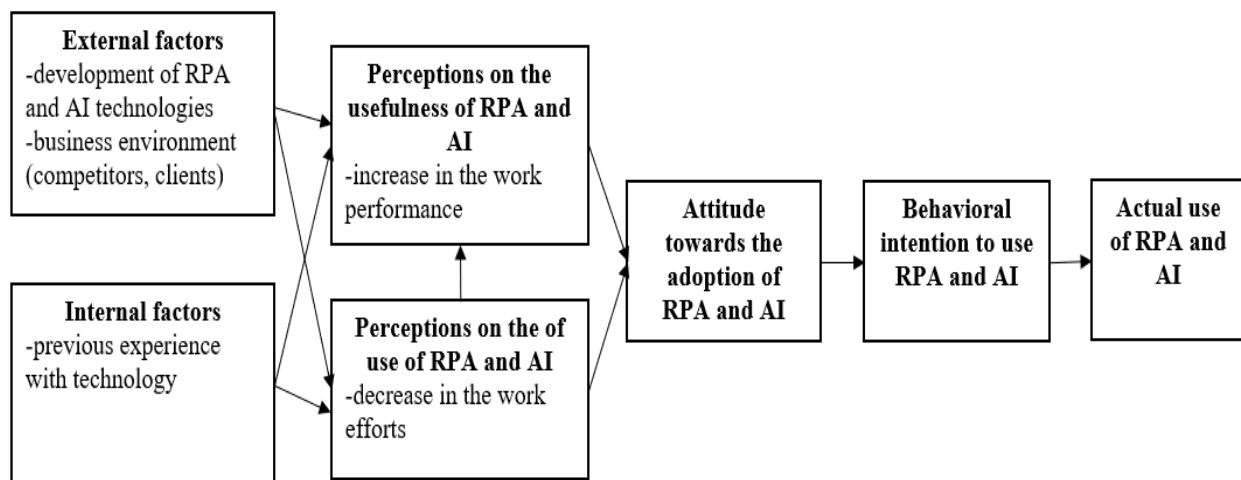


Figure 1. The factors influencing the acceptance of accountants to use RPA and AI technologies

Source: Adapted from Davis et al. (1989, p. 985).

On top of that, the posts created by practitioners on social media groups “Accountants on Facebook” and “Tax advisors’ group”, indicated that the use of RPA and AI technologies in accounting made their work easier and more pleasant, since those time-consuming tasks related to bookkeeping were taken over by the software robots and in this manner, accountants could deal more with data analysis and business consultancy. Similar results regarding the automation of bookkeeping tasks were reported by Harrast (2020) and Möller et al. (2020) who observed a major change in the job of accountants.

More and more accountants believe that the urgency for digitalization of accounting industry is primarily driven by the need to be competitive in a fast-paced business environment by satisfying promptly the clients’ demands. Accounting firms take seriously into consideration the critical statement “digitalize or die”. Most accountants strongly believe that bookkeeping roles are expected to decrease in importance within the following five years and they will disappear in the next decade. Accounting firms are aware that a slow pace adoption of digital technologies will hinder them to operate efficiently and effectively.

Accountants’ response towards the adoption of RPA and AI technologies

Considering the posts made by practitioners, it was emphasized that accounting profession has always adapted very well and quickly to the major development of technologies since it perceived all the changes as opportunities to evolve, stay competitive and serve better the clients. This idea was supported also by Al-Adeem (2023) who stated that accountants are expected to remain relevant for the business environment regardless of technology advances that are intended to simplify the working practices and not to eliminate the need for accountants.

The posts created by the members of “Accountants on Facebook group” and “Tax advisors’ group” revealed that during the last five years the main discussions between practitioners gravitated year by year around topics such as digitalization, artificial intelligence and automation. Most posts were created in the last two years and that indicates an increase in the importance and in the necessity to digitalize the accounting services and to implement RPA and AI technologies.

Previous studies (Cooper et al., 2022; Hasan, 2022; Harrast, 2020; Zhang et al., 2020) ignored the opinion formation and evolution over time among practitioners regarding the adoption of RPA and AI technologies and they focused primarily on large accounting firms on a given moment in time.

The posts related to digitalization topic included aspects such as e-invoice, the use of shared platforms, remote connection solutions, OCR technology, virtual meeting applications and online collaboration. The opinion shared by most accountants is that automation of data collection and processing is crucial in the context of mandatory adoption of e-invoice by all companies in order to simplify the bookkeeping activity.

According to the posts made by practitioners, shared platforms facilitate the exchange of data, documents and reports and their use prevents the loss of documents and reduce delays. For a better understanding, we provided more information in the Table 3 regarding the evolution of the main topics and the number of posts between 2020 and 2024.

Table 3. The evolution of the main topics and the number of posts

Topic and year	2020	2021	2022	2023	2024	Total by topic
automation	201	58	43	237	163	702
digitalization	210	198	186	348	369	1,311
artificial intelligence	31	147	113	126	313	730
accountant's role in digital age	53	116	91	137	68	465
accounting information systems	179	96	88	107	219	689
Total by year	674	615	521	955	1,132	3,897

Source: Own processed information.

Younger accountants raised concerns about their role in digital age and they asked experienced practitioners, if the accounting profession is secure for the future, since they have repeatedly heard that RPA and AI technologies are meant to replace entry-level employees. Older accountants who experienced various transformations throughout their career life due to the development of new technologies and multiple regulatory changes encouraged younger accountants to acquire new digital skills. In prior research on digital technologies and accountants (Möller et al., 2020; Gulin et al., 2019) there were no mentions about younger and older accountants and how they position themselves towards technology advances.

Several practitioners having a longer experience in working with RPA and AI technologies indicated that even though these technologies are not perfect, their use made them to save significant time and released them from the burden of monotonous tasks and allow them to focus more on meaningful activities. These practitioners also indicated that RPA technology processes a significantly higher number of documents compared to humans but it only provides a similar quality of work compared to manual tasks performed by individuals. In their study, Januszewski et al. (2021) specified that the use of RPA technology is expected to make fewer errors than individuals, but most accountants believe that software developers often overstate the features and functionalities of their software products in order to increase their sales.

Some accountants mentioned in their posts that adoption of RPA and AI technologies does not significantly change the main role of external accountants in supporting their clients to manage the business and to comply with statutory requirements. These professionals emphasized that adoption of RPA and AI technologies only changes the working practices in accounting, makes the service provision easier and faster, but the responsibility of accountants remains the same as always.

Many managers of accounting firms complained in their posts by specifying that few years ago they struggled to automate those time-consuming and repetitive accounting tasks in order to make the work of their employees less stressful and more efficient and at this moment, after an increase in the number of clients, they face serious difficulties in finding the right talents because of the shortage of professionals. This finding related to the shortage of accountants is consistent with the information presented in the reports prepared by professional bodies ACCA (2023) and IFAC (2024) and there are serious concerns about the declining number of accountants.

Accounting industry and the use of RPA and AI technologies

Having in view the posts created by the members of “Accountants on Facebook group” and “Tax advisors’ group”, we found that many accountants believe that adoption of RPA, AI and cloud technologies has revolutionized accounting services industry by coming with benefits such as

automatic data collection and processing, data analytics and reporting, permanent access to data and remote collaboration.

Practitioners emphasized that even though there are many benefits of using RPA, AI and cloud technologies, accounting firms have to consider also the challenges which relate to implementation costs, malfunction risks and cybersecurity. Since RPA and AI technologies come with more benefits than risks, larger accounting firms implemented these technologies in order to streamline their delivery of services.

Nowadays, more and more clients manifest an increasing demand for real-time information and that brings a high pressure on accounting firms to reduce the time spent on data collection and processing and to report the information faster and earlier than before and the integration of RPA and AI technologies into the working practices represents the best solution to respond to the time pressures, considering the large number of posts. In prior studies, Gulin et al. (2019) mentioned that the users, especially managers, expect nowadays to have access to information in real-time and Yigitbasioglu et al. (2023) indicated that accounting function is digitalized in a faster pace and in a higher proportion compared to other business functions due to the same reason.

Most accountants agree that the use of RPA and AI technologies has impact on accounting services industry by promoting market growth through a higher productivity and a better profitability. For accounting firms, the impact of using these two technologies involves labor cost savings, service diversification and higher revenues, scalability or the possibility to accommodate more clients, overcoming the shortage of professionals and improving client retention. Service diversification is possible in the context of transferring the repetitive tasks to software robots and as a result of that, professionals have more time to deliver those services that bring more value-added for accounting firms such as financial and non-financial reporting, taxation, business advice, compliance, review and services related to accounting and tax technology.

In relation to the employees, the adoption of RPA and AI technologies means elimination or reduction of repetitive tasks, skill enhancement by acquiring new digital skills, a higher work efficiency, a greater job satisfaction by engaging in more interesting tasks and an improvement in the work-life balance by reducing overtime. The viewpoint shared by a large number of accountants was that RPA and AI technologies can replace the human efforts in many areas of work and these technologies are intended to enhance the human capabilities and they facilitate the transition of accounting professionals from bookkeepers to advisors. In their paper, Huang and Vasarhelyi (2019) also emphasized that RPA technology allows professionals to focus more on those activities that require a higher level of expertise.

Regarding the clients, the use of RPA and AI technologies can ensure a prompt delivery of services or a shorter response time, more accurate information, real-time insights, more time to consult with accountants on various business topics in order to make the right decisions and an increase in their satisfaction level. Since the routine tasks are taken over by software robots, accountants can engage more in data analysis and risk assessment for their clients and provide customized solutions according to their needs in order to improve their business performance and help them to avoid those transactions that bring more losses than gains. In respect to the use of AI technology, Han et al. (2023) mentioned also in their paper that with the support of this technology, accountants can provide reliable information and valuable insights to managers and that is expected to lead to better corporate results. For a better understanding on the impact of using RPA and AI technologies in accounting services industry, in Figure 2 we provide a visual presentation.

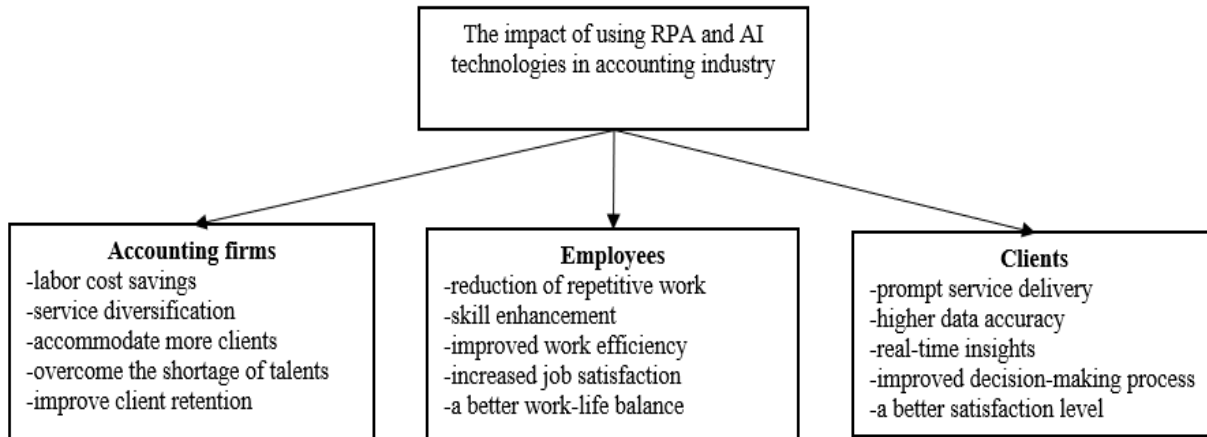


Figure 2. The impact of using RPA and AI technologies in accounting industry

Source: Own processed information.

In terms of task performance, RPA technology facilitates the exchange of data between information systems, processing of documents and automation of rule-based tasks. Most accountants emphasized that AI technology need human oversight and is used in accounting for compliance and business advice purposes, whereas in audit is used for analyzing vast datasets to identify risks, patterns and trends. In prior research Hasan (2022) also mentioned that even though AI technology is very helpful for analyzing large datasets it cannot replace the experience and the expertise of professionals.

Several software developers anticipated the need for automation in accounting industry and by collaborating with accounting experts, they provide at this moment accounting information systems that incorporate the automation of the most important tasks such as downloading and processing of e-invoices, importing and processing of bank statements, reconciliation of accounts, preparation of tax returns and financial statements.

In their posts, practitioners listed the name of some accounting information systems, their acquisition cost, the advantages and disadvantages. These accounting information systems are used by smaller accounting firms based on an annual subscription and all legal updates are included in the annual subscription. Large accounting firms usually collaborate with software developers to adopt more customized RPA and AI solutions, but there are also cases when they have to use the RPA and AI technologies implemented by their clients due to data security restrictions. In previous studies on the use of RPA and AI technologies (Cooper et al., 2022; Zhang et al., 2020) we did not find any information on how smaller accounting firms access these technologies or on large accounting firms using, in some cases, RPA and AI technologies implemented by their clients.

For those clients that need real-time information, accountants mentioned that there are few cloud accounting solutions that incorporate RPA and AI technologies and clients can use these technologies to issue e-invoices and submit e-invoices to tax authority server every day, download of e-invoices issued by their suppliers every day, connect the bank applications to these cloud solutions in order to import and process daily the bank statements. It is important to know that clients can create for themselves reports, analyses and dashboards whenever it is necessary to have knowledge about their business. The good part of using these cloud accounting solutions is that all data can be transferred regularly to some accounting information systems used by accounting firms. This finding was not reported in prior research since the main focus was on large companies and

these cloud accounting solutions mentioned above are more appropriate for small and medium-sized enterprises since their number of documents or transactions is significantly lower compared to large companies.

By comparing the posts created on each social media group, we observed that the topic of digitalization is the most discussed on both groups, then on “Accountants on Facebook group” the topic of automation comes after digitalization, whereas the topic of artificial intelligence has the fewest posts and on “Tax advisors’ group”, the topic of artificial intelligence is the second in importance. We presented more information in Table 4 on the main topics and the number of posts on each social media group in order to gain a better overview.

The differences in the importance of topics can be explained by the fact that accounting tasks deal more with data and the need for automation is higher, while advisory tasks involve more knowledge and reasoning and artificial intelligence can support the practitioners to identify the risks and find the best solutions to mitigate them.

Table 4. The main topics and the number of posts on each social media group

Topic and social media group	Accountants on Facebook	Tax advisors’ group	Total by topic
automation	456	246	702
digitalization	648	663	1,311
artificial intelligence	203	527	730
accountant's role in digital age	271	194	547
accounting information systems	363	326	689
Total by social media group	1,941	1,956	3,897

Source: Own processed information.

Having in view the posts related to digitalization, we discovered that some larger accounting firms choose to outsource some of their core services to smaller accounting firms and for delivery of services, smaller accounting firms have to use digital technologies provided by larger accounting firms. Since we did not find any mention regarding this collaboration practice in prior research, we believe that it has emerged in recent times.

Conclusion

The aim of this paper was to investigate the impact regarding the use of RPA and AI technologies in accounting services industry. We had in view the accountants’ response towards the adoption of these technologies and the effects of using RPA and AI technologies for accounting firms by exploring multiple perspectives.

We employed a qualitative approach by using technology acceptance model as theoretical framework, accounting services market from Romania as research context and we performed a thematic analysis on a number of 3,897 posts with reference to digitalization, automation and artificial intelligence created by accountants on two social media groups (Accountants on Facebook and Tax advisors’ group) in the last five years.

Following our theoretical framework consisting in technology acceptance model, accounting firms implemented RPA and AI technologies to stay competitive under the influence of the business environment, development of technologies, perceptions on usefulness and ease of use.

In the last five years practitioners had discussions concentrated around the topics such as digitalization, artificial intelligence and automation. Most posts were created in the last two years and that indicates an increase in the importance and in the necessity to digitalize the accounting services and to implement RPA and AI technologies. Accounting firms take seriously into account the critical statement “digitalize or die”.

RPA technology facilitates the exchange of data between information systems, processing of invoices and bank statements and reconciliation of transactions. Most accountants emphasized that AI technology need human oversight and is used in accounting for compliance and business advice purposes, whereas in audit is used for analyzing vast datasets to identify risks, patterns and trends.

Practitioners believe that RPA and AI technologies can replace the human efforts in many areas of work and they are intended to enhance the accountants’ capabilities. According to the posts, the impact of using these two technologies in accounting industry relates to labor cost savings, higher productivity, service diversification, the possibility to accommodate more clients, job transformation, overcoming the shortage of professionals, prompt service delivery, improved service quality and elevating the client’s satisfaction level.

We identified two limitations of our paper. The first limitation regards our research context represented by accounting services industry from Romania. Even though, our findings primarily characterize Romanian accounting services industry, conducting future research on the same topic in other countries with characteristics similar to Romania could yield results that are to a greater or lesser extent similar to those revealed by our paper. The second limitation could relate to our approach used to find the relevant posts on social media groups (Accountants on Facebook and Tax advisors’ group). Even though we applied search filters containing the words “digitalization”, “automation” and “artificial intelligence” it is possible to have missed some posts and collecting our data using two social media groups should mitigate that risk.

Our main contribution was to present the impact regarding the use of RPA and AI technologies in accounting services industry and we showed that adoption of RPA and AI technologies has positive effects on accounting firms, employees, clients and other collaborators.

Compared to previous studies that focused on large accounting firms, we brought also empirical evidence on smaller accounting firms having in view the opinions shared by accountants over a five-year period. For smaller accounting firms is more efficient to access RPA and AI powered applications provided by accounting software developers based on annual subscriptions according to their needs.

Thanks to cloud software solutions, some larger accounting firms choose to outsource some of their core services to smaller accounting firms and for delivery of services, smaller accounting firms have to use digital technologies provided by larger accounting firms. Considering that we did not find any mention regarding this collaboration practice between accounting firms in prior research, we believe that it has emerged in recent times due to digitalization.

Our research has implications primarily for accounting firms, practitioners and future professionals. We emphasize that the use of RPA and AI technologies improves the work efficiency, makes the service delivery easier and faster, brings higher accuracy and increases the satisfaction levels among employees and clients.

Considering the shortage of accountants, we believe that accounting students have exciting career prospects ahead of them and because of that we recommend them to acquire business acumen, develop technical and soft skills, join professional networks, gain professional certifications and stay updated on development of technologies and relevant regulations.

Although in our paper we focused mainly on the impact regarding the use of RPA and AI technologies in accounting services industry, yet we realized that we could have discussed also on the importance of crowdsourcing in accounting for information sharing and then about the necessity to invest in hardware, software and network infrastructure prior to adoption of RPA and AI technologies and since they are beyond the purpose of this study, we propose them as future directions for research.

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