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UNDERSTANDING THE OPERATIONAL OUTCOMES OF ADOPTING ROBOTIC PROCESS AUTOMATION SYSTEMS IN AUDIT SECTOR

Abstract. Robotic process automation (RPA) has been widely adopted in many industries as a tool, which does repetitive actions in rule-based business processes. Audit companies around the world are always on the way to making processes more efficient with help of automation and RPA is not an exception. However, there are always two sides of the coin, and there are both benefits and limitations of using RPA. Using RPA may be not efficient in some circumstances, so it is important to understand in what cases using RPA will bring more advantages than disadvantages. The main purpose of this study is to understand the conditions under which adopting the Robotic Process Automation Systems will influence the operational efficiency in the audit firms in Kazakhstan. Because the main purpose of the study is to understand the challenges and opportunities of applying RPA, a qualitative approach has been selected. Data were collected through semi-structured interviews with five specialists in the audit sector. After transcribing the interview conversations, a thematic analysis method resulted in 47 open-codes. In the analysis part was discussed some tendencies, opportunities, and barriers of effective implementation of RPA.

Keywords: Business Process automation, Robotic Process Automation, Automation in Audit, Operational Efficiency, Conditions for RPA.

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Аңдатпа. Роботты процестерді автоматтандыру (RPA) көптеген салаларда ережелерге негізделген бизнес-процестерде қайталанатын әрекеттерді орындайтын құрал ретінде кең таралды. Бүкіл әлемдегі аудиторлық компаниялар әрдайым автоматтандыру арқылы процестердің тиімділігін арттыру жолында, ал RPA да ерекшелік емес. Дегенмен, тиынның әрқашан екі жағы бар және RPA-ны қолданудың артықшылықтары да, шектеулері де бар. RPA қолдану кейбір жағдайларда тиімсіз болуы мүмкін, сондықтан RPA қолдану кемшіліктерге қарағанда қандай жағдайларда көп пайда әкелетінін түсіну керек. Осы зерттеудің негізгі мақсаты- Қазақстандағы аудиторлық фирмаларында роботты процестерді автоматтандыру жүйелерін енгізу жұмысының тиімділігіне әсер ететін жағдайларды түсіну. Зерттеудің негізгі мақсаты RPA қолдану

проблемалары мен мүмкіндіктерін түсіну болғандықтан, сапалы тәсіл таңдалды. Деректер аудит саласындағы 5 маманмен жартылай құрылымдалған сұхбат арқылы жиналды. Сұхбат барысында тақырыптық талдау әдісімен сөйлесулерді ашқаннан кейін 47 ашық код алынды. Талдау бөлімінде RPA тиімді енгізудің кейбір тенденциялары, мүмкіндіктері мен кедергілері талқыланды.

Кілтті сөздер: Бизнес-процестерді автоматтандыру, роботты процестерді автоматтандыру, аудитті автоматтандыру, операциялық тиімділік, RPA қолдану шарттары.

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Абстракт. Роботизированная автоматизация процессов (RPA) получила широкое распространение во многих отраслях промышленности в качестве инструмента, который выполняет повторяющиеся действия в бизнес-процессах, основанных на правилах. Аудиторские компании по всему миру всегда находятся на пути к повышению эффективности процессов с помощью автоматизации, и RPA не является исключением. Однако всегда есть две стороны медали, и у использования RPA есть как преимущества, так и ограничения. Использование RPA может быть неэффективным в некоторых обстоятельствах, поэтому важно понимать, в каких случаях использование RPA принесет больше преимуществ, чем недостатков.Основная цель данного исследования - понять условия, при которых внедрение роботизированных систем автоматизации процессов повлияет на эффективность работы аудиторских фирм в Казахстане. Поскольку основной целью исследования является понимание проблем и возможностей применения RPA, был выбран качественный подход. Данные были собраны с помощью полуструктурированных интервью с 5 специалистами в секторе аудита. После расшифровки бесед в ходе интервью методом тематического анализа было получено 47 открытых кодов. В аналитической части были обсуждены некоторые тенденции, возможности и барьеры эффективного внедрения RPA.

Ключевые слова: Автоматизация бизнес-процессов, Роботизированная автоматизация процессов, Автоматизация в аудите, Операционная эффективность, Условия для RPA.

Introduction

Automation is a global phenomenon that accelerates productivity and brings benefits such as higher quality of service and competitive advantage (McKinsey, 2017). According to the McKinsey Global Institute's report (2017), 50 percent of the activities that people are paid to do in the global economy, especially predictable actions, have the potential to be automated by adapting

currently demonstrated technology (McKinsey, 2017). [1]Automation is a process when by using a machine or software, human involvement is minimized and at the same time brings increased precision (Sarter et al., 1997). Nowadays most companies across various industry domains implemented multiple IT tools and processes to be more efficient. Robotic process automation (RPA) has been widely adopted in many industries such as banking, financial services, insurance, healthcare, manufacturing, telecommunications, etc. (Madakam et al., 2019)

Robotic process automation (RPA) is a software technology that simulates human actions that interact with digital and program systems. With the help of PRA, it is possible to create "robots" that do repetitive actions in rule-based business processes (Janvrin, D. et al., 2008). According to Deloitte's third annual RPA survey, more than 50% of respondents had practice in the usage of RPA and it expects more users in near future. In addition, a survey shows that there is a significant benefit from the adoption of RPA (Deloitte, 2018)[2]. Another indicator of the popularity of RPA is that this segment is considered the fastest-growing software segment in the 2018-2019 years (Gartner Inc., 2021). At the same time, academic research in the area has only recently begun to rise. According to a Google Trends Analysis, 'RPA' only started to become a trendy topic (score: 25/100) in March 2017, but had increased to a score of 100 by September 2018, which indicates the peak popularity of the term (Syed et al., 2020).

Using IT tools in the auditing process is an important part of the efficiency of the work. Auditors extensively use different IT tools in their work to communicate, make analyses, reports, sampling etc. The importance of using IT tools depends on the size of the firm (Janvrin. et al., 2008). Applying IT tools is significant in both technical and administrative procedures (Abou-El-Sood et al., 2015).

Audit companies around the world are always on the way to making processes more efficient with help of automation and RPA is not an exception. Using RPA helps auditors save time on standardized processes and put more of their attention on detailed financial analysis (Deloitte, 2018). However, there are always two sides of the coin, and there are both benefits and limitations of using RPA such as suitability only for rule-based tasks, part of the process still needs to be serviced by human workers, need to check robots' work (Santos et al., 2019). Using RPA may be not efficient in some circumstances, so it is important to understand in what cases using RPA will bring more advantages than disadvantages. The main purpose of this study is to understand the conditions under which adopting the Robotic Process Automation Systems will influence the operational efficiency in the audit firms in Kazakhstan. Therefore, the following question is formulated "What are the conditions under which adopting

the Robotic Process Automation Systems will influence the operational efficiency in the audit firms in Kazakhstan?"

This study was based on a review of the literature and an exploratory approach using semi-structured interviews with the practitioners in the audit industry in Kazakhstan. In this context, the study aims to identify the main trends, opportunities and problems of applying RPA in the audit sector and to understand under which conditions usage of RPA would contribute to the operational efficiency.

Literature review

According to Aguirre and Rodriguez (2017) the Robotic Process Automation (RPA) is "an automation technology based on software tools that could imitate human behavior for repetitive and non-value added tasks such as tipping, copying, pasting, extracting, merging and moving data from one system to another." Usually IT system software communicates with each other via the back-end, but RPA connects with other software with the front-end, so this means that RPA repeats actions as humans do on a computer screen, by mimicking human behavior (Asatiani & Penttinen, 2016). In other words, RPA is not a physical robot that moves in the office, it is a software which can be "trained" to perform operational procedures instead of a human with machine speed, so RPA can delegate to the robot the tasks, where humans take inputs from one set of systems, process those inputs using rules, and then enter the outputs into systems of record (Willcocks et al 2015). Robotic process automation has plenty of applications in different industries, such as retail, healthcare, pharmaceuticals, financial services, telecom, etc. (Asatiani & Penttinen 2016).

One of the promising areas in that RPA can be used is the audit sector. However, the application of RPA in the audit sector is understudied, yet there is an interest from audit companies in using technologies in audit (Moffitt et al., 2015). For instance, there are manual and repetitive procedures in the audit sector, where RPA can be implemented as reconciliations, internal control testing, and detail testing (Moffitt et al., 2019). By using RPA in repetitive procedures, auditors may allocate their time to more complex items and as a result make qualitative audit (Moffitt et al., 2019).

Benefits of RPA

In many papers about RPA scientists list as benefits of robotic automation operational efficiency, quality of service, implementation and integration (Syed et al., 2020). According to Aguirre and Rodriguez (2017), the main benefit of applying RPA is increasing productivity, their results of the case study show that groups with RPA could process 21% more cases than the group who did not use robots. In some articles, it is mentioned that RPA technology could reduce human-related costs by 20-50% and decrease transaction processing costs by 30-60% (Syed et al., 2020). Therefore, based on higher productivity, RPA would bring cost reduction (Aguirre & Rodriguez, 2017). RPA helps to reach results

better, faster, and for less and by this achieve operational efficiency (Willcocks et al., 2015).

Another benefit of using RPA is service quality. By using robots there is a decrease in human error, and fewer mistakes by manual data entry, even if there are mistakes in the RPA process, they are systematic and can be quickly fixed. (Gupta et al., 2019). Also, by delegating the repetitive task to the RPA, employees have more time for a task that needs complex solutions and as a result customer service gets better (Willcocks, 2017). The advantage of RPA from the automation side is that RPA technology does not require a redesign of other IT systems, so it can easily be integrated into current systems without any changes (Asatiani and Penttinen 2016). Applying robots might sound alarming for non-IT specialists, however, RPA interfaces are not so difficult, and codes are generated automatically so that without programming expertise it is possible to be trained in automation within a few weeks (Willcocks et al., 2015).

The benefits of using RPA in the audit are that it saves time on repetitive, rule-based procedures and pays more attention to critical analysis (Huang & Vasarhelyi, 2019). In addition, by saving time RPA gives opportunities to decrease the level of stress and pressure on the company and employees (Willcocks, 2017).

Limitation and challenges of RPA

According to Asatiani and Penttinen (2016), even RPA (front-end systems) afford speed and flexibility, the back-end systems are superior and fully automated. In addition, Asatiani and Penttinen (2016) note the competition between robots and employees, and fear that robots will create unemployed humans; however, there is more positive feedback in practice (Willcocks et al., 2015). RPA is effective with rule-based, standardized processes, in reality, inputs may be taken from different resources and create interpretation challenges for the software, so this means that data need a standardization process first (Moffitt et al., 2015). Considerable limitation for audit is privacy and security, because auditor uses many confidential data, applying an RPA system may lead to cybercrimes, therefore, it is important to measure and prevent cybersecurity risks (Moffitt et al., 2015). In practice, there appear to be some challenges in applying RPA. According to Rutaganda et al., (2017) common issues that are incorrect RPA leadership at the top level, select incorrect RPA use cases and lack of clear business case, KPIs, or success criteria, no long-term RPA vision or roadmap, trying to deliver RPA benefits on shifting sands, dated project delivery approaches for RPA.

Referring to the KPMG report "Sustainable IT Restart 2021", the main barriers for companies to invest in the introduction of new technologies in Kazakhstan are lack of talent, difficulty in changing corporate culture, cyber risks and personal data risks, bureaucracy and lack of innovation management processes, technology immaturity, difficulty in calculating and monitoring the effects of new technologies, lack of interest from top management and shareholders,

problems with data architecture and data management processes, lack of funds, high operational risks (KPMG, 2021).[3]

Criteria when use RPA

As was shown in the previous section, there are many limitations and challenges in applying RPA technology; it is not usable for all types of business processes. Consequently, there are assessing criteria of RPA suitable tasks. The basic two factors are repetitive (routine) and manual: more routine and more manual tasks better fit for automation and non-routine tasks that need cognitive effort or creativity are likely to less need automation (Asatiani & Penttinen, 2016).

According to Leslie Willcocks (2017), the process that is considered to be automated with robots should be stable, mature, optimized, rules-based, repetitive, and usually high-volume. Another important consideration for those wishing to adopt robots is the long-term strategy of usage of RPA in the company, and the readiness of management, IT department, and governance to adopt and build a mature enterprise capability for RPA (Willcocks et al., 2017). In addition, criteria might be considered with the KPIs: internal and external. Internal KPIs are employee productivity, cost-saving, job satisfaction, and process acceleration and external KPIs are customer satisfaction, cooperation with partners and suppliers, or stock market value (Hofmann et al., 2019). Based on Syed et al. (2020), the followings are characteristics of RPA-suitable tasks: highly rule-based, high volume, mature, easy to achieve and show, has digitized structured data input, highly manual, transactional, standardized, low levels of exception handling, highly repetitive, less complex processes, interacts with many systems

Methodology:

Robotic Process Automation Systems (RPA) is not so well known in Kazakhstan and practical applications of the concept are limited (Reznik, A, 2020). Besides, empirical studies in the context are scarce. Therefore, conditions under which the adoption of RPA the Robotic Process Automation Systems will influence the operational efficiency in the audit sector are the primary objectives of the current study. As argued by Moriarty (2011) if limited knowledge about a concept or a concept is understudied in a specific context, qualitative methods should be used to understand the underlying mechanisms.

As one of the seminal studies in the field, qualitative research would help to address the research objective. A semi-structured interview with the professionals in the audit sector was used to collect the data. That is mainly

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[3] KPMG .Устойчивые ИТ. рестарт 2021. (January, 2021). https://home.kpmg/kz/ru/home/insights/2021/02/restart-2021.html

because interviews enable researchers to deeply understand the phenomenon in interest and establish novel relationships between various concepts. Moreover, semi-structured interviews are more flexible and give more opportunities to create new information. In addition, asking different questions from respondents will result in more interesting and useful answers. Finally, the next interview questions are modified after the analysis of the previous interview(s).

Initially, 10-15 open-ended questions were prepared but gradually the volume and structure of the questions have been refined after every interview (see Interview Protocols in Appendix A). Besides, spontaneous questions were generated during the conversations. Initially, a consent form was prepared by the researcher and signed by the respondents. Interviews were recorded on digital devices with the permission of the interviewees. Afterwards, each interview was transcribed and analyzed in the original language. The interviews were performed either face-to-face or online format, depending on the time and physical availability of the respondents. The following Table 1 displays details of the interviews:

Table 1. Profile of interviews

№	Language	Format	Duration (in minutes)	Interviewee pos
1	Russian	Online	26'	Assistant of aud
2	Russian	Online	32'	Assistant of aud
3	Russian	Online	45'	Assistant of aud
4	Russian	Offline	43'	Senior
5	Russian	Offline	25'	Senior manager

As seen in the table above, interview language was determined by the proficiency of the respondents in a specific language: Russian or Kazakh. Due to its qualitative nature and a scarce number of potential respondents, a convenience sampling method was used. In addition, the majority of the respondents were junior or senior auditors with at least 1 year of experience, who are either currently employed or had experience in the sector.

Analysis

After transcribing interviews, thematic analysis resulted 47 open-codes and combined under seven concepts as displayed by the following table.

Table 2. Themes and codes

Theme	Codes

Routine work in audit	Test to details; journal entries testing; vouching; ser emails; visualization; interns' scope; higher position routine work; RPA in Europe
Need of automation in audit	Monkey job; minimal skills; simple work; bur shortage; stress; lack of specialists; mistrust to robots;
Application of RPA in audit	RPA in Europe; critical thinking; new cases; huge vol of transactions; delegation; positive reaction; fea replacement; changes of scopes; higher requirements
Benefits of RPA application	Speed; efficiency; no human error; less emplo turnover; covering big population;
Limitations of RPA applications	Standard inputs; no critical thinking; new cases; ma edition of primary data; expenditures;
Barriers of RPA application	Different levels of development; Digitalization; tech environment; infrastructure; two side developr converting inputs; specifics of the region; not ma accounting
Conditions to effective implementation of RPA in audit sector in Kazakhstan	Department for IT innovations; standardized accour system; unstable accounting system; automation of cli need of resources;

Routine work in audit

The interview data once revealed that audit has many routine tasks, which are highly repetitive including standardized procedures such as sampling, test to details, journal entries testing, vouching, sending emails to counterparties and preparing visualizations. According to the answers, these procedures are not difficult to do but need time and energy resources. In respondents' answers, it was highlighted that employees at position intern, audit assistant 1 mostly have that routine and standardized tasks such as testing, and vouching. According to the answers of the senior, the reason for such tasks distribution is the skill and experience of the worker:

"Usually A1 and interns have the same scope of work, that is, it is limited to certain sections and certain tasks, and when their project cycle is high, it often becomes routine and they get tired of it."

Also in the interview with the assistant of auditor two was mentioned that it is not beneficial for the senior to engage in vouching and that routine tasks help trainees and the first-year assistants to adapt to the work. This means as an employee has a higher position he/she does fewer routine tasks and does work that is more critical. Nevertheless, it can be noticed that there is routine work that can be automated in all positions starting from interns to managers. Even senior manager is waiting for the moment when robots could help them in sending email letters:

"If we take Europe, it seems that they have already automated this process, they have robots that do it for them. It hasn't come to us yet, but it should come sometime."

Need for automation in audit

According to the results of the first interview, there is a demand for the application of automation processes in the audit sector due to a shortage of specialists and stressful work. This shortage can be noticed by the open vacancies by the end of the "busy season", where usually the demand for auditors is low. Moreover, always doing routine and a repetitive jobs could get bored quickly, as was mentioned by the respondent, assistant auditor 2:

"However, you also understand that you get minimal skills and experience at such a job and at the same time spend the maximum amount of time and energy, in some places you may feel burnout."

This shows that doing such routine work or "monkey job" as told respondent leads employees to feel bored, burnout and may result in the idea to quit the job. Other respondents also support that it will be very helpful for them to implement some automation in audits to reduce time on routine tasks, but there are exceptions too. Respondent in the second interview says that there are enough tools and there is no need for further automation. Such position could be based on mistrust of robotic technologies due to they could not think critically and there is an additional risk that robots will work with mistakes.

Application of RPA in audit

RPA is currently being used in Europe; robots assist auditors with sending emails to counterparties. As mentioned in other interviews there are opportunities to implement robots for routine, repetitive tasks, especially with high volume projects. However, auditors say that there no a lot of work that is fully standardized, they say that there are some new things in each project, so for each case, they should analyze data critically. That is why respondents doubt that robots could do auditor's work fully. It has been discussed that RPA could be implemented if properly written algorithms with many opportunities to update programs, and codes. Moreover, if RPA has critical thinking abilities as artificial

intelligence (AI), it will be more effective. Because, robots could not think critically, and robots might not be able to react if new cases urge.

Questions about the reaction of employees to the application of RPA were also asked. It was found that generally, most employees would have a positive reaction to it because it will help to reduce spending time on routine work and decrease stress levels. However, points about negative reactions were too, so some auditors may worry that robots will eliminate their positions. The interesting deduction was made that application of RPA/automation would affect the scope of employees at a lower position (intern, assistant of auditor 1) so that requirements to this position while hiring workers could be changed, and more experience and skill might be demanded.

Benefits of RPA application

Most studies highlight a benefit of RPA its efficiency, less human error and saving time (Syed, et al,2020). All respondents posit that RPA applications should bring the increased speed of work and result in higher efficiency, and better productivity. In addition, it was also mentioned that robots would eliminate human error and achieve greater accuracy by covering the whole population. Moreover, such automation will bring improvement in employee turnover, there will be less "monkey job" and less volume workload, and people will work on more critical tasks, so workers turnover will reduce.

Limitations of RPA applications

As was discussed earlier, respondents consider that robots could not do all tasks due to the lack of intelligence, and critical thinking that is needed in many situation, so it means that auditors worry about risk from automation mistakes. In addition, the auditors mention that RPA works according to the written algorithm, there will be a necessity to edit the program for each new case or standardize inputs for RPA, which will bring manual work again. According to the assistant of auditor 2, implementation of RPA is costly because of the need for some funding for personnel, and technical support. Nevertheless, in studies, many researchers point out that the application of RPA is reducing cost and increasing operational efficiency (Lacity, Willcoks, Craig 2015). This shows the importance of choosing the process where RPA will be implemented, if a proper business process was conducted with RPA, this automation will bring cost efficiency to the business.

Barriers of RPA application

The first barrier is a low level of automation in companies. Automation cannot expand only on one side, both audit and client companies should develop IT infrastructure. Even if audit companies realize RPA, there will be manual, routine tasks of converting inputs from provided by clients' format to standard format for software and this will lead to double work due to poor digitalization processes and IT infrastructure. Therefore, a low level of automation and poor IT infrastructure of client companies will negatively effect on efficiency of RPA.

As indicated by most respondents, the next barrier is that there are different development levels of accounting system in Kazakhstan companies. Some companies use updated accounting systems, and some of them still use handwritten journals or excel files for accounting. Such material differences in accounting system will interfere robotic automation because of the need processing primary data. According to responses of senior, the accounting system in Kazakhstan is still changing and developing:

"Considering the specifics of our region and clients, they do not have any permanence in accounting systems, you can unload the same upload for the next year, and it will already look different because the client does not have any permanence. This should be taught to the client, I think, in order to implement automation well."

This quotation shows that the accounting system now is not standardized and unstable and this will lead to fact that it will be necessary to constantly repair robots or process inputs.

According to the interviews, it was found that another barrier in audit companies is that technical solution, and automation tools are transferred from other regions such as Europe, so their templates do not fit with local companies' data, this means that there is a low level of design, development of automation tools in Kazakhstan branches. The root of this general poor level of automation might be the scarcity of resources of local companies for IT innovations or lack of motivation to develop automation:

"In addition, IT solutions require time to study, implement, and train employees, and due to the large volume of work of auditors, they do not have time to think about new methods. Perhaps if the company has a separate department that will take on these tasks, then automation may have developed faster."

Conditions for effective implementation of RPA in the audit sector in Kazakhstan

Participants of interviews were asked which conditions are needed for the effective application of RPA in Kazakhstan. Those conditions were followed by barriers discussed previously. All respondents indicated that there are lack of automation, and digitization processes in local companies:

"I believe that digital changes in Kazakhstani companies are necessary for the development of automation in the audit. Unfortunately, now customers cannot yet provide us with data in a standard form, which could immediately be entered into the system with automation, that is, you first need to process all the primary data manually."

For efficient work of RPA, improvement in automation is required not only in audit companies but in clients too. One side automation will lead to double work for auditors due to converting inputs to standard form. According to the

KPMG report (2021), 90% of companies in Kazakhstan and Central Asia name the main difficulty in the implementation of digitalization projects, problems with finding the right personnel, so to improve the digitalization process in the market there is a need for qualified IT specialists. This KPMG report (2021) also shows that Kazakhstan companies are step-by-step paying more attention to IT innovations.

Another condition for efficient RPA application in audit t is a need for a permanent and formed accounting system for client companies:

"I think if the company has standardized accounting, clearer rules for the introduction of accounting, then it would be much easier to implement this kind of automation..."

As mentioned in the literature review, it is not beneficial to apply RPA to non-mature processes (Rutaganda et al., 2017). Hence, there is a need for steadiness persistence in the accounting system among local companies for efficient usage of RPA. Last, but not least, is the arrangement of a special team or department who will implement the RPA system. While planning the implementation of RPA it is important to consider the readiness of management, and the IT department (Willcocks, 2017). Respondents also support the need for a special team that will focus on RPA automation. According to Lacity, Willcoks, Craig (2015), RPA technologies are quite easy to learn and use and RPA does not need a redesign of other IT tools (Asatiani & Penttinen 2016). In addition, RPA is closer to a business tool than an IT tool, so there should be management in the application of RPA in the long term (Rutaganda et al., 2017). Therefore, for effective implementation of RPA in a company, it is needed a team which covers both IT and managerial aspects.

Conclusion

As it was defined in the analysis part, there is routine work that can be automated in all positions starting from interns to managers, but there is a tendency that position intern and audit assistant 1 mostly have those routine and standardized tasks due to their work scope. According to the results of the interviews, there is a need for the application of automation processes in the audit sector due to the shortage of specialists and stressful work. There are many standardized, repetitive, routine procedures in audit, so such demand for automation and shortage in specialists indicates big opportunities for the success of RPA implementation. This study aimed to indicate under which conditions usage of RPA would contribute to operational efficiency. The results show that there are barriers that could negatively affect the successful implementation of RPA in the audit sector. These barriers are low level of automation in local companies, different and unstable accounting system in Kazakhstan, and scarcity of resources for IT innovations. Further results indicate that for efficient implementation of RPA in audit in Kazakhstan the following conditions are required:

- Improvement in digitalization and automation processes in local companies;

More permanent
- and mature accounting system in companies;
- Building a special department that will focus on IT innovations including both IT and management specialists.

Results of this study show that currently there are barriers to the efficient application of the RPA in auditing in Kazakhstan. This means that before the planning and implementation of RPA in the audit sector companies should take into consideration the specifics of the region and try to create conditions where robotic automation will bring operational efficiency. This study could help to understand in which cases it is beneficial to use RPA and to make decisions about the use of RPA.

There are might be several limitations in the research work. The first is applying convenience sampling for interviews. The limitation of convenience sampling is that it can produce biased results and the possibility of under or over representations of the results. Another limitation is the lack of prior research studies on the topic. RPA is a relatively new topic for research, and the application of RPA in auditing is an even more unexplored narrow topic. Such a lack of previous researches could form biases and limit the research scope.

Several additional topics for further research have been highlighted by the studies attempted for this research. These include further investigation of conditions under which automation tools brings maximum benefits for local small-medium business (SMEs), as SMEs is an important part of the country's economy. To obtain results that are more pragmatic it would be recommended to use the case study method to get a full analysis of conditions.

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