

STREAMLINING BANKING PROCESSES BY IMPLEMENTING RPA

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Abstract:

The expansion of the digital transformation phenomenon imposes certain trends, strongly changing the traditional way of doing business. Being a constant process, it requires organizations to adapt to the current environmental conditions. Digital transformation creates significant opportunities for companies to streamline their operations. Among those the opportunity to implement Robotic Process Automation can be identified, a technology that is not just a means of efficiency, but a resource that can be adapted for a variety of tasks. This paper presents the tool through a literature review and a case study on the implementation of the solution in banking. Thus, as objectives were established the definition of RPA concept and the benefits associated with the technology, as well as the identification of its implementation opportunity and effectiveness in the banking sector.

Keywords: Automation, Digital Transformation, RPA, Banking 5.0

JEL classification: O33, E59

1. Introduction

Human adaptability is an ongoing research topic focused on analysing the flexibility of the human being to adapt to current environmental conditions. Together with human intelligence, this is the main reason why humanity exists today. The need for peace, security, comfort, and a high level of well-being are the driving forces behind the development and emergence of human society in its present form. Since prehistoric times, people have been trying to make their lives easier by combining and processing different raw materials such as stones, wood or bones, inventing tools such as axes, spears and hammers. Today, in the age of digital and information technologies, the principle has not changed at all. More and more needs are emerging and, as a result, more and more solutions are being developed to facilitate human activities. However, the rise of solutions that satisfy certain needs generates others, precisely because of the human aspiration towards the absolute.

Innovation and technological progress have an impact on society. They are imposing certain trends, which are reflected in the change in the traditional way of doing business and the emergence of new business models, based on various software and online platforms, which do not yield to traditional models. Today, recognition and adoption of new technologies and new versions and strategies for their use have become the basic elements for survival in the context of the technology and information age. In the case of companies or public organizations, a quality IT infrastructure leads to efficient operations and increased adaptability, therefore resulting in the need for digital skills for people who want to occupy senior positions in any company or public organization.

An important aspect, which has been in place since the development of mechanized factories, is *automation*. Increasingly, there is a trend to develop technologies that perform tasks instead of people, from production processes to making breakfast. In essence, the subject of automation comprises activities that are carried out repetitively over a period and according to certain rules. Such processes are found in all industries, at all levels of business, whether digital technologies are used.

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The pandemic crisis has accelerated the digitalization of society, setting in motion a new industrial revolution based on human-centred personalization, the so-called *Industry 5.0*. Digitalization is the main driver behind the possibility of automating various business activities, which may include filling in and signing forms and documents, preparing quarterly reports, transferring data from one source to a database, processing invoices or other documents. This can be done with the help of digital tools developed for this purpose.

With the digital transformation of the economy, as well as the popularization of automation, the objective of this paper is to make a short introduction in the automation software tool which can streamline the repetitive digital activities within any industries, as well as to determine the efficiency and approach to cyclical processes and the adoption of this tool within banking institutions. This paper involves a set of objectives. The first goal includes reviewing the scientific literature, thus identifying the essence of RPA technology as well as its associated benefits. The objective of chapter two is to develop and present an implementation plan for the automation solution. Chapter three includes the definition of the concept of a process in RPA, and the final chapter presents a case study of the implementation of the technology in a banking institution.

2. Literature review

In any organization there are a lot of repetitive, error-prone and annoying tasks that consume a significant amount of many employees' time. One solution to reduce the time spent on these tasks is to automate them using robots. When it comes to robots, most of us see them as hardware, with a design adapted to perform certain tasks, which may or may not resemble the human body. However, this view is not always true, as robots can also exist in virtual form, as software programs that help perform certain processes, tasks or even perform them for someone.

The concept of *Robotic Process Automation (RPA)* is not as complex as digitization or digital transformation. Thus, there are unified definitions of automation solutions in the scientific literature. Nowadays, Robotic Process Automation, is a type of automation software that can be used to create, configure and control software robots (bots) that can learn, execute and repeat various digital processes based on specific rules (UiPath, 2021b). With Robotic Process Automation a variety of manual processes that human workers perform can be automated, reducing the burden of recurring tasks. The software robot can perform a flow of step-by-step tasks by interacting with various applications, reading and writing data, performing numerical calculations, modifying and renewing data (Issac et al., 2018). Robots created using the technology represent a virtual workforce with human-like digital skills. They can interact with any system or application, being able to insert text, navigate, identify and extract data. These bots can perform any task much faster than humans and with low probability of error. Under these conditions, RPA bots can be adapted to perform processes consisting of repetitive, monotonous tasks, and the human factor can be involved in activities that require more creativity and intelligence.

According to Lin et al., (2018), RPA is the key capable to solve major problems related to internal business processes. They highlight the solution's ability to *reduce costs, increase productivity and efficiency of internal processes, significantly reducing errors*. Increased productivity is highlighted as an advantage by Micah Smith, (2021), who argues that RPA robots, by performing tasks independently without human intervention, ensure more efficient work. In highly bureaucratic industries such as insurance, financial services, public sector, virtual robots can streamline and speed up digital processes. This author also highlights as an advantage the compatibility of RPA technology with any other type of software. RPA robots can interact with any application, regardless of version. This makes companies more flexible in eliminating cumbersome technologies and adopting new software, independently of the department, resulting in efficiencies and collaborations never seen at enterprise level. Also, the combination of Robotic Process Automation and *Artificial Intelligence (AI)* opens new opportunities for the digitization of business processes. With the help of RPA, robots with AI capabilities can be developed in the form of *Machine Learning (ML)*, *Natural Language Processing (NLP)*, *Optical Character Recognition (OCR)* models, thus creating sufficient conditions for robots to grasp and process documents, view images, or even understand and maintain conversations via chat. The technology can

be integrated into the front office, thus streamlining interactions with customers, increasing customer satisfaction by reducing the time it takes to deal with customers and performing all system and data entry tasks much faster compared to an employee, thus meeting customer needs much faster (Micah Smith, 2021). In these circumstances, coupled with the digital transformation process of organizations, results in increased *scalability* of the solution, giving organizations significant flexibility to adapt their software infrastructure (Bayraktar Dorin et al., 2022).

With a clear vision of the essence of the technology, the authors of the research reviewed focused their attention on investigating the benefits of the tool in specific areas such as media, insurance, banking or in various business processes. According to Moffitt et al., (2018), implementing RPA can streamline audit processes, reducing complexity and increasing the speed of audit completion. At the same time, the likelihood of performing tasks erroneously is reduced, thus excluding audit risk. This conclusion results from the fact that before launching the solution, it is tested using real datasets in real conditions. The totality of the deficiencies detected during testing allows corrections to be made and thus a reliable solution to be launched. However, sometimes there are not enough conditions to assess the full extent of existing situations, which can lead to errors. But the flexibility associated with the technology ensures the constant possibility to adjust the solution, thus addressing deficiencies detected during deployment. The author pointed out that RPA tools are much more intuitive and easier to use compared to solutions such as Excel macros, IDEA or Python, which also can be used in order to automate various audit processes such as reconciliations, analytical procedures, internal control testing or detail testing Moffitt et al., 2018).

According to Moffitt et al., (2018), RPA robots are able to replicate human activities with high accuracy as configured. Robots can connect to applications using their own login data, receive and send emails, read documents, identify salient information, perform analysis, reports, input data. Compared to Excel macros, RPA can be implemented to automate digital processes, bots interacting with any existing desktop or server software applications. Thus, RPA is identified as a better alternative to outsourcing, involving lower costs and higher productivity. Automation software can be deployed to perform repetitive tasks with increased speed and efficiency, thus providing an opportunity for organizations to delegate tasks to their employees that can contribute significantly to company's growth. At the same time, RPA can be integrated to streamline human activities, thus generating collaboration between human and bot.

One problem identified during the elaboration of this paper was that the literature is quite deficient in the study of how to implement automation software tools, a key research topic in the context of the increasing digitalization of business processes. Thus, in the following I set out to study and present a brief implementation plan for RPA, which can be customized according to the specific needs of an organization.

3. What is a *PROCESS* in RPA?

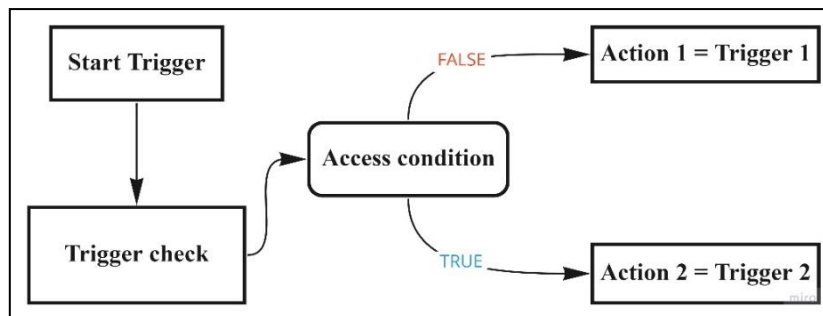
Regardless of its complexity, any activity carried out is a process and its structure can be analysed to determine all its key elements. The success of the implementation of the RPA solution depends directly on the definition of the process concept in RPA and the efficiency of determining the repetitive digital tasks that can be subject to automation. In RPA, a **process** can be defined as *a set of mutually dependent instructions and steps, carried out successively according to a predetermined procedure and depending on certain access conditions*, which in turn represent specific criteria for evaluating and validating the start of the process or the result of the previous step. The digital processes that can be automated with the solution are divided by the degree of interaction with the human factor into two broad categories: fully automated processes and partially automated processes. *Fully automated processes* are those digital tasks that can be performed entirely by the software robot configured for this purpose and include little interaction with the employee. The second category of processes (*partially automated processes*) involves collaboration between the employee and the RPA bot to perform tasks based on input from the former. However, the concept of process in RPA has a more technical structure but is based on the principles of the processes carried out daily.

In this paper, a process has the following components:

1. **The trigger** is the element whose existence or appearance starts the stages of the automated process.
2. **Access conditions** are environmental variables, embodied in the features of the trigger that determine whether a step is achieved.
3. **The result of the reporting** is an element that involves reporting the trigger to the access conditions, thus determining the next step the bot will perform.
4. **Execution commands** are actions performed according to the specifics of the reporting result.

The combination of these four elements is the standard set of process elements. Depending on the complexity of the process structure, processes can be classified into simple and complex processes. **Simple processes** comprise a single set of steps, usually with the following structure:

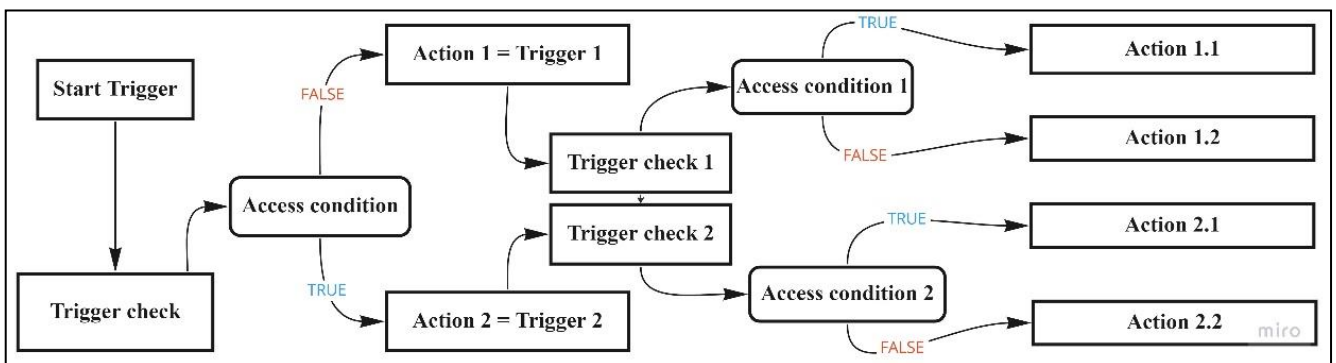
Figure 1: The structure of a simple process



Source: Developed by the authors

Complex processes are those that consist of several sets of steps, hence several simple processes. (Figure 2).

Figure 2: The structure of a complex process



Source: Developed by the authors

An example of a simple process would be to receive an invoice by email from a particular supplier X and download it to a folder created to store invoices issued by that supplier. Under these conditions, the elements of the process are:

- i. Process trigger = receipt of an e-mail.
- ii. Access condition = the sender of the e-mail is supplier X.
- iii. Execution commands:
 - a. Positive reporting result, i.e., the access condition is satisfied: Action 1 = Download and save invoice to X folder;

- b. Negative reporting result, i.e., the access condition is not met Action 2 = Forwarding the e-mail to the responsible employee.

The simple process described above can be one stage of the invoice processing workflow, which is much more complex, involving several distinct steps, with paths identified according to several access conditions, as shown in Figure 2.

Understanding the concept of process in RPA is very important in implementing the solution. This results from the need to structure each step in a detailed way. Each click or scroll has increased relevance in the structure of the process that is to be automated, the omission of a single step equates to the impossibility for the software robot to efficiently perform the automated process.

4. RPA in Banking

Banking, being one of the most bureaucratic sectors, involves many cyclical activities, such as collecting customer data from various sources and entering it into the bank's database to meet information needs. Thus, it is a perfect system for implementing RPA software. One example is *Yapi Kredi Bank*, a banking institution from the Turkish system, which has extensively implemented the RPA solution developed by industry leader UiPath to streamline the work of auditors and employees. In the case of auditors, the purpose of the software robot was to collect, systematize and provide the auditors with all the necessary documents and information, thus streamlining the bank audit activity. In the case of employees, *Yapi Kredi Bank* chose to configure RPA bots to perform repetitive digital tasks, such as collecting customer data from various sources and entering it into the bank's database to meet customer needs, as well as determining future market trends (UiPath, 2021a). In this way the bank has created conditions for reorienting human capital towards achieving higher value objectives.

Another example is *Banca Transilvania*, which has implemented *UiPath's* RPA software tool, thus moving towards a new level of digital transformation. As part of the RPA implementation, the bank focused on increasing efficiency and employee satisfaction, as well as offering new experiences to their customers. For its employees, it has set up assistant-bots, the object of which is to provide the necessary information via chats (Banca Transilvania, 2018).

Given that banking institutions are among the most digitised and have a well-developed software infrastructure, next chapter will include a case study, materialised in the implementation of RPA to automate the processing of individual customer requests generated through digital channels. The chapter is structured in the following two sub-chapters: defining the need to automate the processing of requests generated through alternative channels and structuring and explaining the automated process.

4.1 The automation of the data updating requests

Digital banking channels are becoming increasingly used by customers, the most popular of which are online banking and mobile banking, which have become standard products of any banking institution due to the functionalities included. Through these solutions, customers, both individuals and businesses, can carry out a wide range of transactions from anywhere in the world, provided they have a stable internet connection. Online and mobile banking, which have become established concepts, include certain basic functionalities such as 24-hour access to financial statements, IBAN viewing, intra-bank or inter-bank transfers, bill payments, scheduling of regular payments, location of bank branches and ATMs.

With the standardisation of digital channel features, banks are tending to broaden the range of functionalities covered, thus making customers increasingly independent of the geographical location of the banking institution.

In this case study we will explore in detail the influence of implementing Robotic Process Automation for the handling and solving of identity and/or contact data update requests generated by customers via online/mobile banking. Before we start going into the details of the process, let's assume that the bank has invested in the development of a program, called **Request Manager**, which is designed to handle customer-generated requests through alternative channels such as mobile banking, online

banking, chatbots, new customer current account opening platforms, etc. Request Manager is similar to a ticketing platform, where each request is logged at the time of creation and can be picked up by any employee by accessing the request and assigning it to their own user. For managing and performing repetitive digital tasks recorded in the Request Manager platform, RPA is an efficient solution compared to employees, who in turn can perform tasks that require more creativity. In this case, Request Manager will be the main trigger for activities carried out by robots (Figure 3). Once a new request has been registered, depending on its typology, the platform triggers a process that activates the software bot configured to perform the tasks required to solve the request. By configuring software robots to resolve customer requests received in the Request Manager platform, it will be possible to meet their needs in accordance with all required standards.

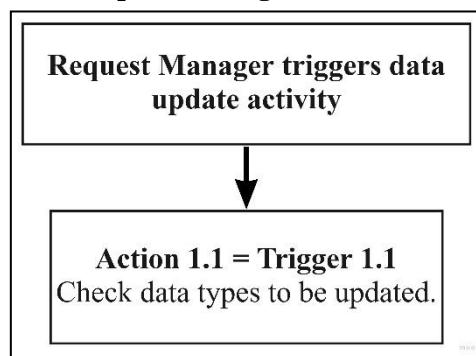
In addition to the legitimation, there are several conditions that need to be met to generate and maintain business relations with a bank. Keeping customer data up to date is a legal obligation for banking institutions, as laid down in *Regulation 2/2019 on preventing and combating money laundering and terrorist financing*. Being perceived by customers as a bureaucratic process, individuals do not tend to go to the bank to update data once certain changes have occurred (BNR, 2019). Under these circumstances, one of the key functionalities of internet banking is updating identification or contact details.

The possibility for customers to update their data via online or mobile banking would free banking institutions from the need to "fuss" the customer with invitations to the unit where human resources would perform the update task, and customers from the time wasted waiting in line.

4.2 Development of the automated process using RPA

As mentioned above, the platform will be the main trigger for the processes carried out by the bots. The bot activated will be determined according to the typology of the request. Thus, for the resolution of a data update request, the platform will activate the bot that has been configured for that task, which will then perform the other synthesizer tasks (Figure 3).

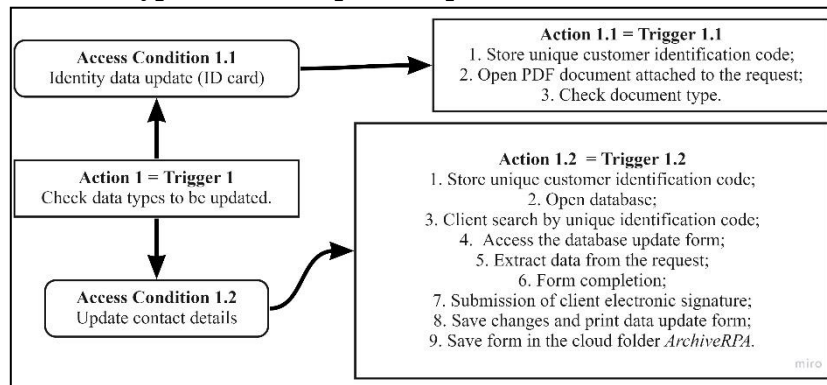
Figure 3: Request Manager as the main trigger



Source: Developed by the authors

As this is a data update request, the software bot will follow the set of instructions established for this task (Action 1, Figure 4). It will start by identifying the type of data to be updated, since for identity data update the PDF document attached to the request need to be verified, whereas for contact data update there is no verification procedure executed by the RPA bot. Instead, the proof of contact details is done in the application by the customer through entering a validation code obtained from the updated email address or phone number.

Figure 4: Check type of data to update requests sent from online/mobile banking

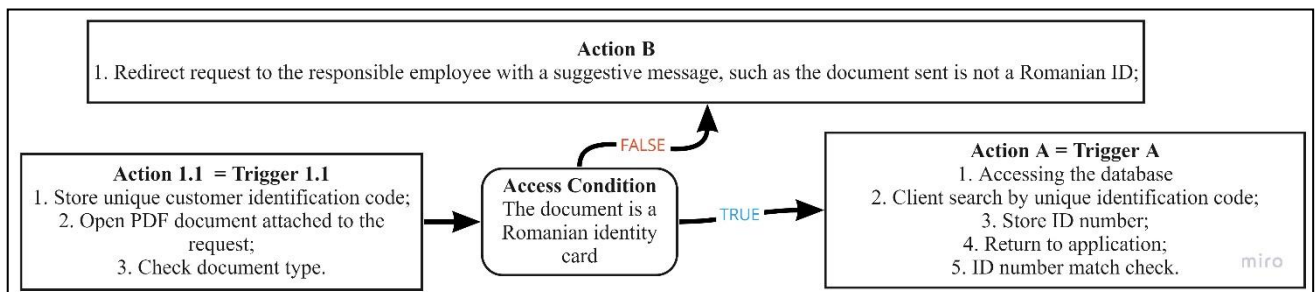


Source: Developed by the authors

The process of updating contact details (Action 1.2, Figure 5) involves searching for the customer by their unique identification code in the database, filling in the reference form with the details from the request, signing it on behalf of the customer, printing it out and sending it to the archiving department, thus ending the activity.

In the case of an ID update, the RPA robot will only be able to recognise the Romanian ID, as most individual customers are Romanian citizens. But this does not imply that foreign customers will be deprived of the possibility to update their identity card via digital channels. Thus, in case of a request to update identity data, the bot will execute the set of activities specific to action 1.1 (Figure 4). It will start with the memorisation of the unique customer identification code that will be used in a next step. Next, it will check whether the document in the PDF is a Romanian ID card, by identifying its specific customisation elements, like the legitimation process. In the case of foreign citizens, the bot, not identifying the ID, will redirect the request to the responsible employee with a suggestive notification that the scanned document is not Romanian ID. In these situations, the update will be done by that employee (Figure 5). The main reason why the adaptation of the foreign ID reading bots could not be accepted is the bank's policy in dealing with customers who are citizens of other EU or non-EU countries and with customers who are associated with a high risk of money laundering or terrorist financing according to *Regulation 2/2019 on the prevention and combating of money laundering and terrorist financing*. However, bots could be set up to identify foreign identity documents for customers who are not associated with any risk, but this can only be discussed when there is full transparency between Romania and the home countries of those customers.

Figure 5: Check if the document is a Romanian ID card

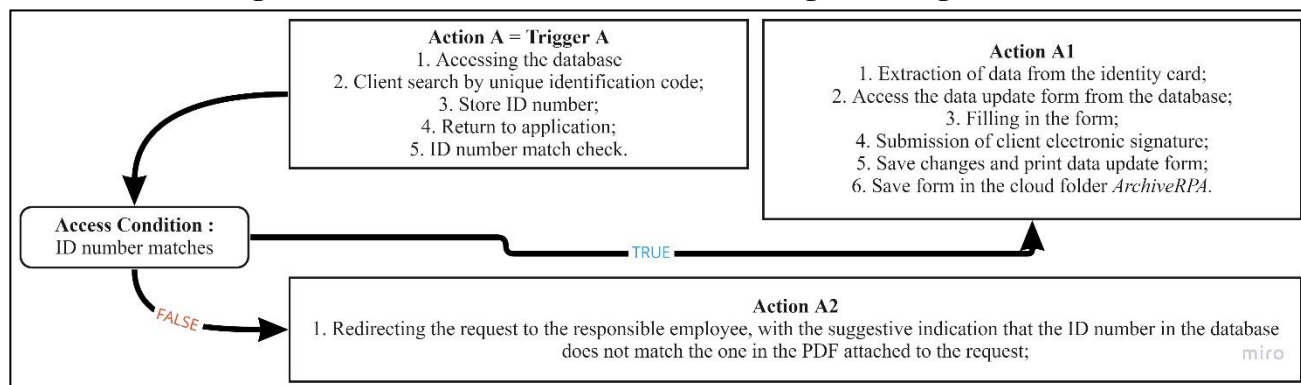


Source: Developed by the authors

If access condition is met, the bot will open the database where, using the unique identification code stored in the previous action, will go through the procedure of verifying that the ID attached to the request really belongs to the customer, the account holder, and not to someone else, thus preventing erroneous updating of data. The procedure involves comparing the identification number extracted from the attached document with the identification number existing in the database for the identified customer.

The prerequisite for completing the update process is that the identification number matches, and then the robot executes a set of instructions, such as completing the update form, saving the changes, printing the form, and sending it to the automated archiving department (Figure 6). The signature that the bot submits on the form is the one used by the customer in dealing with the bank. The action is justified by satisfying all the security conditions and procedures, as follows: authentication by the customer in the application using a PIN code or biometric authentication, validation of the request using the authentication methods and the confirmation code obtained by the customer via SMS or an e-mail sent by the banking institution.

Figure 6: Check if the ID document sent belongs to the right customer



Source: Developed by the authors

The non-matching of the IDs will result in the RPA bot redirecting the request to the responsible employee with a suggestive message that the IDs do not match, so the update cannot be completed. In this situation the employee will have to contact the customer and fix the problem.

5. Conclusions

The existence of a variety of repetitive processes in any business, as well as the expanding phenomenon of digital transformation of organizations, presents a perfect opportunity for organizations to adopt Robotic Process Automation to streamline monotonous and time-consuming tasks. As we have observed from the literature review, researchers' views on RPA are identical, identifying the advantages of the solution. The benefits of the technology highlighted include its ability to increase the efficiency of internal processes, from generating and transmitting digital documents to receiving and resolving customer requests.

Due to the regulations imposed to ensure society's trust in the banking system, there are significant opportunities for implementing RPA. In this paper, only an automated process has been presented, its structure being flexible to the specifications of any bank's software infrastructure and can be adjusted and refined. Automating the processing of customer requests to update data generated through digital channels is an advantage for the bank in that it can obtain up-to-date information at any time, regardless of the customer's location or time zone related to their geographical location. At the same time, the bank benefits from the opportunity to engage human capital in tasks that require human creativity and reasoning, thus achieving value-added objectives for the bank.

Considering the expansion of the digital transformation phenomenon on the whole society, RPA will become a ubiquitous technology in the next period in the software infrastructure of any organization, and the skills to use the technology will become decent digital abilities.

Objectives for future research include identifying and structuring other digital banking processes. It would be useful to do a more detailed analysis of all digital banking processes as well as the software infrastructure to identify further opportunities for automation. This will make it possible to structure new automated processes capable of increasing the efficiency of activities carried out within banking institutions.

References

- Banca Transilvania. (2018, October 12). *Trei companii din Romania, parteneriat pentru inovatie: Banca Transilvania, UiPath si Druid.* <https://www.bancatransilvania.ro/news/comunicate-de-presa/trei-companii-din-romania-parteneriat-pentru-inovatie-banca-transilvania-uipath-si-druid>
- Bayraktar Dorin, Vârtei Andreea-Mădălina, & Avram Nicoleta-Elena. (2022). *RPA THROUGH ORGANIZATION 5.0 – A BRIEF LITERATURE REVIEW.*
- BNR. (2019). *Regulamentul nr. 2/2019 privind prevenirea și combaterea spălării banilor și finanțării terorismului actualizat 2022.* Lege5. <https://lege5.ro/gratuit/gm2dgnrxha3q/regulamentul-nr-2-2019-privind-prevenirea-si-combaterea-spalarii-banilor-si-finantarii-terorismului>
- Friedrich-Alexander-University Erlangen-Nuremberg, Chair of Digital Industrial Service Systems, Nuremberg, Germany, Hindel, J., Cabrera, L. M., & Stierle, M. (2020). Robotic Process Automation: Hype or Hope? In M. heine, K. Poustcchi, & H. Krasnova, *WI2020 Zentrale Tracks* (pp. 1750–1762). GITO Verlag. https://doi.org/10.30844/wi_2020_r6-hindel
- Gami, M., Jetly, P., Mehta, N., & Patil, S. (2019). *Robotic Process Automation – Future of Business Organizations: A Review* (SSRN Scholarly Paper No. 3370211). <https://doi.org/10.2139/ssrn.3370211>
- Hofmann, P., Samp, C., & Urbach, N. (2020). Robotic process automation. *Electronic Markets*, 30(1), 99–106. <https://doi.org/10.1007/s12525-019-00365-8>
- Issac, R., Muni, R., & Desai, K. (2018). Delineated Analysis of Robotic Process Automation Tools. *2018 Second International Conference on Advances in Electronics, Computers and Communications (ICAIECC)*, 1–5. <https://doi.org/10.1109/ICAIECC.2018.8479511>
- Ivančić, L., Suša Vugec, D., & Bosilj Vukšić, V. (2019). Robotic Process Automation: Systematic Literature Review. In C. Di Ciccio, R. Gabryelczyk, L. García-Bañuelos, T. Hernaus, R. Hull, M. Indihar Štemberger, A. Kő, & M. Staples (Eds.), *Business Process Management: Blockchain and Central and Eastern Europe Forum* (Vol. 361, pp. 280–295). Springer International Publishing. https://doi.org/10.1007/978-3-030-30429-4_19
- Leshob, A., Bourgouin, A., & Renard, L. (2018). *Towards a Process Analysis Approach to Adopt Robotic Process Automation* (p. 53). <https://doi.org/10.1109/ICEBE.2018.00018>
- Lin, S. C., Shih, L. H., Yang, D., Lin, J., & Kung, J. F. (2018). Apply RPA (Robotic Process Automation) in Semiconductor Smart Manufacturing. *2018 E-Manufacturing & Design Collaboration Symposium (EMDC)*, 1–3.
- Micah Smith. (2021). *What is RPA? Robotic Process Automation.* Automation Anywhere. <https://www.automationanywhere.com/rpa/robotic-process-automation>
- Moffitt, K. C., Rozario, A. M., & Vasarhelyi, M. A. (2018). Robotic Process Automation for Auditing. *Journal of Emerging Technologies in Accounting*, 15(1), 1–10. <https://doi.org/10.2308/jeta-10589>
- Pramod, D. (2021). Robotic process automation for industry: Adoption status, benefits, challenges and research agenda. *Benchmarking: An International Journal*, 29(5), 1562–1586. <https://doi.org/10.1108/BIJ-01-2021-0033>
- Ribeiro, J., Lima, R., Eckhardt, T., & Paiva, S. (2021). Robotic Process Automation and Artificial Intelligence in Industry 4.0 – A Literature review. *Procedia Computer Science*, 181, 51–58. <https://doi.org/10.1016/j.procs.2021.01.104>
- Siderska, J. (2020). Robotic Process Automation—A driver of digital transformation? *Engineering Management in Production and Services*, 12(2), 21–31. <https://doi.org/10.2478/emj-2020-0009>
- Syed, R., Suriadi, S., Adams, M., Bandara, W., Leemans, S. J. J., Ouyang, C., ter Hofstede, A. H. M., van de Weerd, I., Wynn, M. T., & Reijers, H. A. (2020). Robotic Process Automation:

Contemporary themes and challenges. *Computers in Industry*, 115, 103162.
<https://doi.org/10.1016/j.compind.2019.103162>

- UiPath. (2021a). *RPA Use Case in Financial Services—Yapı Kredi Bank* | UiPath.
<https://www.uipath.com/resources/automation-case-studies/yapi-kredi-bank-expanding-rpa>
- UiPath. (2021b). *What is Robotic Process Automation—RPA Software* | UiPath.
<https://www.uipath.com/rpa/robotic-process-automation>