

# BENEFITS AND THREATS OF ACCOUNTING PROCESSES AUTOMATION<sup>1</sup>

## Introduction

The development of knowledge-based economy sectors has been pursuing for several decades, but in recent years it has been significantly accelerating due to the use of modern information and communication technologies in the production of goods and services as well as social processes. The importance of IT technology in the functioning of modern economies and societies is so important that terms like: “digital economy” and “digital competences” are well-known and commonly used. It emphasizes that it is currently difficult to imagine the functioning of societies without these types of technology. Their development is related to the use of an increasing amount of information resources in economic and communication processes, as well as increase of information processing capabilities. For example, D. Nordhaus estimated the real cost of carrying out a standard set of computational tasks and discovered progress in the field of conversion capabilities, which significantly accelerated in the 1970s of the 20th century, especially due to the spread of microprocessors. In addition, in the years 1980–2006 the actual cost of a standard calculation set decreased by 60–75% annually on average. Information processing unimaginably expensive 30 years ago, e.g., searching the full text of the university library for a single quote – has now become trivially cheap [Nordhaus, 2007: 128].

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<sup>1</sup> The publication was financed with subsidies for maintaining the research capacity granted to the Faculty of Commodity Science and Product Management and Faculty of Management at the Cracow University of Economics.

At present, the automation of processes is already commonly used in production. It helps to reduce costs by increasing efficiency as well as limiting human work, which is becoming more and more expensive. Another benefit of automation is also higher and more stable quality of manufactured products. Automation does not only involve robots replacing people, but it is also based on automated systems: transport, visual, drive or RFID (*Radio-Frequency Identification*). It also covers implementation of IT systems, which facilitate manufacturing process management. This area of the organization's activities estimated at 15–20% of business processes is perceived as a key factor in competing on the market. The remaining approx. 80% are commodity processes that are necessary, but their performance may be at the average level in industry [Franz, Kirchmer, 2012]. The development of IT solutions supporting production processes, is the main assumption of the contemporary industrial era, referred to as 4.0 [Schwab, 2017]. Automation is, first of all, applied in mass processes. In these conditions it is most cost-effective.

More and more often automation is also used in mass office processes. For instance, robotic process automation (RPA) experienced in 2016 a 68% growth rate in the global market. Some reports predict it will reach a \$ 8.75 billion market value by 2024 [Hindle et al., 2017: 5]. Such solutions are introduced to the highest extent in global shared services centers sector. These are organizationally separated entities, most frequently in the form of companies, providing services to multi-division enterprises. These services mostly relate to auxiliary processes such as: accounting, human resource administration services, payroll services, IT services. According to research by Ernst & Young, more than 80% of global multi-division enterprises have shared services centers [Łukaszczyk, 2018: 303]. Such units are very often located in countries with lowest labor costs. According to the report "Global Shared Services 2017", prepared every two years by Deloitte, Poland presently holds the third place (*ex aequo*) with China and Mexico, among the most frequently indicated countries for locating shared services centers, after the United States (14% of the indications) and India (12%) [Deloitte, 2017: 6]. Primary benefits of creating such centers, according to the researched respondents, are: common methods and administrative structure, employment optimization, costs reduction. Most of processes performed in shared services centers are mass in nature. More and more often, in order to increase their effectiveness, automation is used in these processes, including robots. According to the Deloitte report, 8% of the shared services centers already use it in at least one process, 26% are in the course of implementation, and 24% are running reconnaissance works in this regard [Deloitte, 2017: 16]. The development of such solutions and their application in practice is extremely fast. It results in many changes, causing various social consequences.

The purpose of the article is to present technical and business conditions for accounting process automation as well as benefits and hazards involved of such solutions, based on results of current research and analysis carried out primarily by global consulting and advisory companies, such as: Deloitte, Ernst & Young, KPMG, McKinsey.

# 1. Automation of accounting processes – technical and business conditions

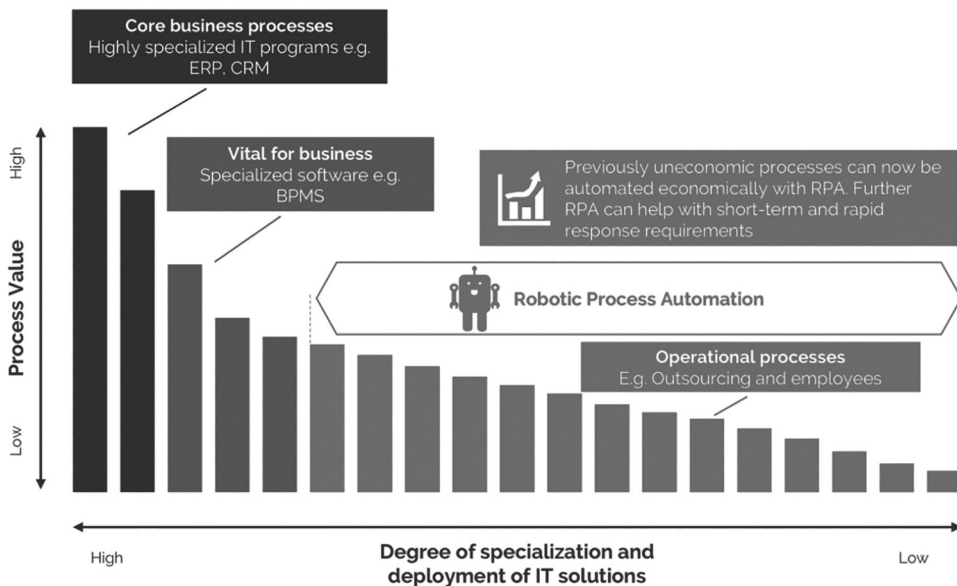
Generally, pace and extent of automation is determined by following five factors, i.e.,:

- technical feasibility; technology needs to be invented, integrated and adapted to specific applications. Machines can outperform humans on some of the tasks, including information retrieval, gross motor skills, and optimization and planning, but many other capabilities require more technological development. For example, in typical work activities one needs simultaneously multiple capabilities, such as sensory perception and mobility and thus solutions that integrate specific capabilities in particular context must be engineered;
- cost of developing and deploying solutions. While developing and engineering automation technologies is capital intensive, also “virtual” solutions that are based on software require real investments in engineering to create solutions. But software solutions, by comparison, tend to have a minimal marginal cost, which usually makes them less expensive than wages and thus they tend to be adopted earlier. Over time, the costs of hardware and software are shrinking, making solutions more competitive in relation to the human workforce in the growing number of activities;
- labor market dynamics. The availability of specific skills, quantity, as well as supply, demand and costs of human workforce influence selection of activities that will be automated. For example, the decision on the automation of specific activities is determined also by labor costs of a person performing this activity, as well as the availability of people willing to perform a specific job for a given wage;
- economic benefits, like: increased profit, increased throughput and productivity, improved safety, and higher quality, which sometimes exceed the benefits of labor substitution [Manyika et al., 2017: 8–9].

Automation of accounting processes involves implementation of the solutions generally defined as RPA (Robotic Process Automation). These solutions are computer software (systems) allowing automatic data transfer and processing in a virtual environment. RPA programs operate on the principle of imitation of human behavior. They log in to specific applications, collect data, transfer them to a database or another application, perform processing operations. However, the processes operated in this way have a limited degree of complication. Here, the point is mostly to increase efficiency and reduce human labor in performing arduous and repeatable processes. RPA solutions are therefore in the first place applied in the implementation of simple, mass processes, which are simultaneously characterized by a limited number of exceptions in the rule of the algorithm. While in analytical and decision-making

processes, related to supporting management of specific business areas, various IT solutions are already quite commonly applied (ERP, CRM, BPMS, etc.), simple data processing processes, are still, to a significant extent performed “manually”. Such processes are often referred to as “long-tail”. They are still quite common in accounting centers, where mass processes of recording accounting documents are entirely performed by employees (Figure 1).

Figure 1. Degree of specialization of the processes and their automation

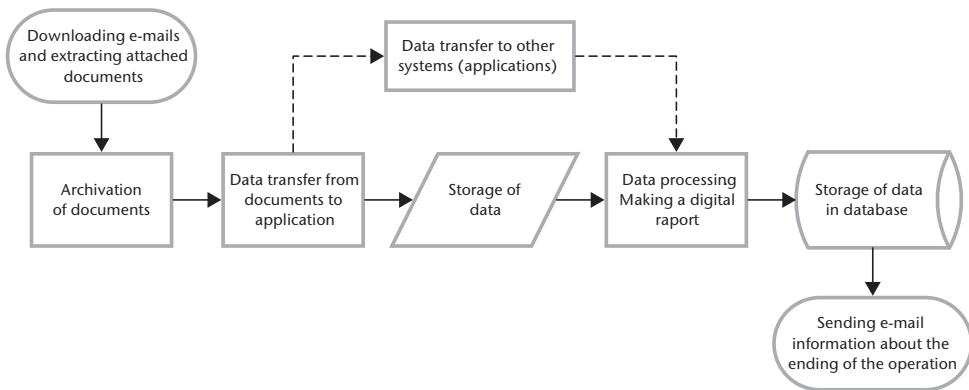


Source: Rhenus Data Office Polska [n.d.].

The currently offered RPA solutions allow automatic performance of any operations: on files (txt, xml, doc, xls, pdf, etc.); in applications (web, windows, terminal, etc.), with the use of an API of the specified system; on databases (MS SQL, Oracle, MySQL, etc.) [Virtual Operations, 2014]. The solutions applied in accounting processes make it possible to:

- download e-mail and separate appendices, based on a specific criterion;
- read data from each file (e.g., PDF) and convert them to a different program (e.g., MS Excel);
- archive data (recording) in the application, database;
- transfer data between applications;
- operate on data, create summary statements and reports;
- send e-mail information to the operator after the process (task) has ended (Figure 2).

Figure 2. Automated accounting process



Source: own study.

The automation of business processes, apart from RPA systems, also includes solutions referred to as Robotic Desktop Automation (RDA), being a software class for automating business processes on a single work post. Unlike RPA, in these systems particular operations are supervised by the controller, who can take over full control over the process at any time [Seasongood, 2016: 32].

## 2. Business and social consequences of accounting process automation

Over the last decade enterprises operating on the global market (earning more than \$ 100 million in annual revenue) have significantly reduced the costs associated with financial services, performed within shared services centers. These companies have completed standardization and automation of key processes with regard to: “manual” handling of the transactions on accounting accounts and customer’s accounts and settlement of amounts due and keeping general accounting. They promote an efficiency-based culture on every level. They monitor costs of performing most operations, from money transfers to cost refund applications. Funds saved in this way are spent on employment and developing accounting team members, responsible for planning, cost analysis as well as identification of efficiency models [Driscoll, 2015: 26–27].

As studies conducted by Deloitte consultancy show, although automation is not commonly used in shared services centers, it is perceived as the second factor expected to change this sector, right after streamlining of processes. In fact it is expected that, especially in the scope of the financial function, up to 56% of the tasks can be

automated [Nagarajah, 2016: 34–37], resulting in reduced costs. Automation does allow a shorter time of performing the tasks and may result in financial centers' cost savings of as much as 50–70%. It also contributes to optimization of the financial processes, which can be performed 24 hours a day [Deloitte, 2015: 7] (Table 1).

Table 1. Traditional vs automated BPO

Characteristics of work optimization (using the traditional methods)	Characteristics of automated work
15–30% reduction in labor costs	50–70% reduction in labor costs
The model is scalable as much as labor can be scaled	The model is scalable and is independent of growth in the amount of labor
Theme: "More for less"	Transition: a new way to run business
Access to low cost labor necessary in order to achieve permanent growth	Access to specialists who may digitize manual processes
Revenue/benefits dependent on people	Revenue/benefits are not dependent on people

Source: KPMG [2015], after: KPMG [2016].

A principal defect of automation is discovered on this background. The application of automated processes is a potential source of jobs reduction in offshoring centers, and consequently may result in unfavorable trends on local labor markets, including a significant growth in unemployment levels. KPMG forecasts that, over the next 15 years, from 45% to 75% of the present work posts in financial offshoring centers will be eliminated through process automation. Savings in such centers' operating costs are estimated on a similar level [KPMG, 2016: 2–6].

It can be concluded from similar research that 47% of all the employed in the U.S. economy are in the high automation-related risk group [Frey, Osborne 2013: 38]. As a result of automation, the professions they practice may be eliminated within the next two decades. For comparison, this percentage also ranks relatively high for other economies, e.g., in Finland – 35%, Norway – 33% [Pajarinen et al., 2015: 1–8], Europe 54%, Singapore 25% [Bowles, 2014]. McKinsey estimates that no more than 5% of all the professions can be automated completely using current technologies, on the other hand, at least 30% of the tasks are subject to automation on approximately 60% of all work posts. Operations most prone to automation include physical activities in highly structured and predictable environments as well as those related to data gathering and processing. In the U.S. such works account for 51% of the activity in the economy [McKinsey Global Institute, 2017: 8]. In particular data gathering (64% automation potential and 17% of the working time in the economy) and data processing (69% automation potential and 16% of the working time in the economy) are performed almost in all the sectors and most frequently consist in: administering

human resources, payroll, transaction data; placing data in insurance, credit, bank, health institutions' forms [McKinsey Global Institute, 2017: 44].

Automation also results in a lower demand in the group of employees with high competences, performing complex processes. For instance, the number of bankers, merchandisers, traders and other employees on Wall Street, working on the so-called front office posts decreased by 16% in the period 2010–2014. KPMG predictions demonstrate that until 2026, 100 million so-called knowledge employees all over the world will be substituted by automated processes [KPMG, 2016: 14].

The professions most exposed to automation are telemarketers – 99%, accountants and auditors – 94%, retail sellers – 92%, real estate agents – 86%, text editors and typists – 81% [Frey, Osborne 2013: 68–72]. And thus automation is a hazard for many professions, and, as assumed, accountants may feel most endangered by the expanding office process robotization.

Studies by Deloitte have allowed to identify positions in the financial area with a low, medium and high risk of automation:

- low probability of automation was connected with the work of: business and financial project management specialists, financial directors and managers;
- medium probability of automation involves the positions: purchasing managers and directors;
- high probability of automation refers to the positions: payroll managers, financial administrators, credit controllers, financial accounts managers, financial and accounting technicians, finance managers [Nagarajah, 2016: 34–37].

In the face of the growing automation, accountants should aim to successively improve their competences, especially to minimize the risk of their profession being regarded as automation ready. In particular they should be oriented on fulfilling, to a bigger extent, strategic and analytical roles. As research findings show, relatively basic works in the area of accounting, related to settlement of transaction, receivables and payments will be automated to a growing extent, but works requiring higher competences, related to planning and strategic advice, studies and financial controlling will still be performed by people. For instance, accountants' team work, consisting in consultancy to top management regarding cost optimization requires interpersonal skills which computers are not able to demonstrate [Nagarajah, 2016: 34–37]. In general, the harder it is to automate work, the higher the level of the following work post functions is required: perception and manipulation (of items and information), creativity and social intelligence [Frey, Osborne 2013: 31].

The analysis of the available literature has also allowed to identify key barriers to administrative process automation, in particular accounting processes. In the first place fundamental limitation include high costs, which companies' boards of directors are reluctant to accept. For instance, one of the investment banks, to automate selected processes, spent \$ 100 million for this purpose. The obtained benefits balanced the

expenses, but the investment was costly. The implementation of automated processes also requires a relatively long time necessary for analysis of the performed processes and procedures in the organization and their translation into instructions that can be automated. Finally, a significant barrier in the implementation of such solutions can refer to the cultural aspects, especially on the part of the managers, who have become accustomed to managing large teams of people [KPMG, 2016: 9]. Additionally, studies conducted by ACCA (Association of Chartered Certified Accountants) illustrate relatively high concerns (no trust), related to the application of automated processes to personalized, complex tasks [Nagarajah, 2016: 34–37]. The barrier of automation is also the wrong choice of the process subjected to automation. For example, a large financial company in Australia has launched over 1,000 software robots to automate tasks. These bots were installed within two years, and a year later the company ceased to use the automation tools. The digital initiative caused too many problems: the processes changed more often than expected, so the bots created too many exceptional situations that had to be handled manually. The elimination of the bottleneck caused serious problems that nobody anticipated and the cost reduction was less than expected [Kirchmer, 2018: 39].

## Conclusion

Potential benefits that can be obtained by companies through the application of automation include:

- reduction in operating costs, especially through reduced employment;
- reduction in human error rates and improved efficiency;
- improved quality and customer satisfaction, as information processing is run in real time, 24 hours a day, and can be performed out of the peak hours;
- allows organizations to focus human resources on the process of creating value, in particular performance of nonroutine and non-standard tasks;
- increased speed of performing operations;
- automated processes, coupled with data analysis, make it possible to assess diverse and extensive information resources (the so-called Big Data), which can be used in identification, standardization and analysis of significant information at the level of the entire enterprise;
- increase scalability of the operations and improve compliance; in particular banks and other financial institutions, before starting operations, must fulfill multiple formalities, resulting from legal regulations, e.g., KYC (Know Your Customer), AML (Anti-Money Laundering), FATCA (Foreign Account Tax Compliance Act) which are perfectly fit for automation [Ernst & Young, 2016: 4–5; KPMG, 2016: 6–12; Schatsky et al., 2016].



In summary, the following groups of risk can be identified and considered by financial and accounting managers when deciding whether to implement automation:

- technology – if current technological infrastructure is coherent with automation solutions;
- regulatory compliance – failures and inaccuracy caused by automation solutions can reduce accuracy of regulatory reports, eventually posing a risk of fines and sanctions as well as legal violations;
- operations – increased processing errors can be caused by badly designed automation solutions. Lack of effective control procedures can lead to increased operational inefficiencies;
- talent – during the implementation of automation, the organization and organization climate may suffer, which is why special attention should be paid to communication with employees and emphasizing that due to automation their work will be more complex and innovative. In addition, the access and supervision of automated processes must be managed to prevent and detect abuse;
- financial reporting – badly implemented RPA within finance can result in inaccurate or incomplete financial reports, financial restatements and reputational damage [Knowles, 2018].

Automation does change the nature of work of a contemporary finance specialist, reducing routine works, in place of which they can concentrate on strategic tasks, interactions with stakeholders, formulating conclusions on the basis of analysis of information, in order to improve business performance. Technological progress and automated processes become true business partners of professionals and give them more time to act in the strategic areas. Finance specialists will have to keep up with the technology, in order to maintain competitive advantage on the market and further develop their digital skills, which will be more and more often sought by employers [Nagarajah, 2016: 34–37]. Implementing and applying automation, the efficiency of the management system should be ensured. In that respect, worth quoting are the Kyle Cheney's Senior Manager at Deloitte & Touche comments: "Without strong internal controls, thoughtful change management, consistent oversight monitoring, and well-built bots in production, finance and accounting robotic process automation efforts can cause more harm than good. As with any strategic initiative, trying to find shortcuts is unwise. Investing time and attention to honing RPA is essential to realizing its full potential" [Knowles, 2018].

## References

- [1] Bowles J. [2014], *The computerisation of European jobs*, Bruegel, Brussels.
- [2] Deloitte [2017], *Global shared services 2017. Survey report*, <https://www2.deloitte.com/content/dam/Deloitte/us/Documents/process-and-operations/us-global-shared-services-report.pdf> (access: 12.12.2018).
- [3] Deloitte [2015], *The robots are coming. A Deloitte insight report*, UK.
- [4] Driscoll M.C. [2015], *Cutting cost of finance*, CFO, October.
- [5] Ernst & Young [2016], *Robotic process automation in the finance function of the future*, US.
- [6] Franz P., Kirchmer M. [2012], *Value-driven business process management: The value-switch for lasting competitive advantage*, McGraw-Hill, New York.
- [7] Frey C.B., Osborne M.A. [2013], *The future of employment: How susceptible are jobs to computerization?*, Oxford Martin School, UK.
- [8] Hindle J., Lacity M., Willcocks L., Khan S. [2017], *Robotoc process automation: Benchmarking the client experience, knowledge Capital Partners 2017*, [www.knowledgcapital-partners.com](http://www.knowledgcapital-partners.com), (access: 12.12.2018).
- [9] Kirchmer M. [2018], *Enabling high performance in the digital age*, ISE Magazine 50(11).
- [10] Knowles B. [2018], *Benefits and risks of automating finance & accounting*, CTMfile, 12<sup>th</sup> Feb, <https://ctmfile.com/story/benefits-and-risks-of-automating-finance-accounting> (access: 20.02.2018).
- [11] KPMG [2015], *Bots in the back office*, US.
- [12] KPMG [2016], *Rise of the robots*, US.
- [13] Łukaszczyk Z. [2018], *Centrum usług wspólnych szansą na optymalizację kosztów i standaryzację procesów w jednostkach samorządu terytorialnego*, *Zeszyty Naukowe Politechniki Śląskiej. Seria: Organizacja i Zarządzanie* 121.
- [14] Manyika J., Chui M., Miremadi M., Bughin J., George K., Willmott P., Dewhurst M. [2017], *A future that works: Automation, employment and productivity*, McKinsey Global Institute, [www.mckinsey.com/featured-insights/digital-disruption/mgi](http://www.mckinsey.com/featured-insights/digital-disruption/mgi), (access: 22.02.2019).
- [15] McKinsey Global Institute [2017], *A future that works: Automation, employment and productivity*, <https://www.mckinsey.com/global-themes/digital-disruption/harnessing-automation-for-a-future-that-works> (access: 25.09.2018).
- [16] Mejsner B. [2016], *Roboty w centrach BPO*, *Computerworld*, <https://www.computerworld.pl/news/Roboty-w-centrach-BPO,406337.html> (access: 12.12.2018).
- [17] Nagarajah E. [2016], *Hi robot. What does automation mean for the accounting profession?* *Accountants Today*, July/August.
- [18] Nordhaus W.D. [2007], *Two centuries of productivity growth in computing*, *Journal of Economic History* 67(1).

- [19] Pajarinen M., Rouvinen P., Ekeland A. [2015], Computerization threatens one-third of Finnish and Norwegian employment, *ETLA Muistio. Brief* 34.
- [20] Rhenus Data Office Polska [n.d.], *Co to jest robotic process automation (RPA)?*, <https://www.rhenus-data.pl/pl/uslugi/bpo-bpm-software-roboty/robotic-process-automation/> (access: 14.12.2018).
- [21] Schatsky D., Muraskin C., Iyengar K. [2016], *Robotic process automation: A path to the cognitive enterprise*, Deloitte University Press, [www.dupress.com](http://www.dupress.com) (access: 10.12.2018).
- [22] Schwab K. [2017], *The fourth industrial revolution*, Penguin, UK.
- [23] Seasongood S. [2016], Not just for the assembly line: A case for robotics in accounting and finance, *Financial Executive* 32.
- [24] Virtual Operations [2014], *Robotic process automation. The discovery assessment*, [https://www.everestgrp.com/wp-content/uploads/2014/10/Discovery-Assessment-Overview\\_VO-2014.pdf](https://www.everestgrp.com/wp-content/uploads/2014/10/Discovery-Assessment-Overview_VO-2014.pdf) (access: 16.12.2018).

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## BENEFITS AND THREATS OF ACCOUNTING PROCESSES AUTOMATION

### Abstract

Automation of accounting processes is a new, dynamically developing phenomenon in the area of services in the scope of financial services for businesses. This solution involves a number of business benefits, but also creates certain hazards. It also requires adjustment of the IT system, associated with the accounting process. The purpose of the article is to present the essence of such solutions, their benefits and hazards involved, in the light of research conducted so far. The main research method used in the article was the analysis of secondary sources in the form of research reports of consulting companies, such as Deloitte, Ernst & Young, KPMG, McKinsey, which monitor the development of the discussed phenomenon. The analysis covered, among others, such reports, as: "Global Shared Services 2017"; "The robots are coming", "Rise of the robots", "A Future that works: automation, employment and productivity". Results of the surveys with employees of Cracow's shared services centers were also used in the article.

**KEYWORDS: AUTOMATION OF ACCOUNTING PROCESSES, OFFICE PROCESSES, SHARED SERVICES CENTERS, BUSINESS MODELS**

**JEL CLASSIFICATION CODES: M15, M16, M40**

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## KORZYŚCI I ZAGROŻENIA AUTOMATYZACJI PROCESÓW KSIĘGOWYCH

### Streszczenie

Automatyzacja procesów księgowych jest nowym, dynamicznie rozwijającym się, zjawiskiem w obszarze usług z zakresu obsługi finansowej firm. Rozwiązanie to wiąże się z szeregiem korzyści biznesowych, ale także tworzy pewne zagrożenia. Wymaga również dostosowania systemu informacyjnego, związanego z procesem księgowania. Celem artykułu jest przedstawienie istoty funkcjonowania tego typu rozwiązań oraz ich korzyści i zagrożeń, w świetle dotychczasowych badań. Główną metodą badawczą artykułu była analiza źródeł wtórnych w formie raportów badawczych firm konsultingowych, monitorujących rozwój omawianego zjawiska, jak: Deloitte, Ernst & Young, KPMG, McKinsey. Analizie podane zostały m.in. takie raporty, jak: „Global Shared Services 2017”; „The robots are coming”, “Rise of the robots”, “A Future that works: automation, employment and productivity”. W artykule wykorzystano również wyniki wywiadów z pracownikami krakowskich centrów usług wspólnych.

**SŁOWA KLUCZOWE: AUTOMATYZACJA PROCESÓW KSIĘGOWYCH, PROCESY BIUROWE, CENTRA USŁUG WSPÓLNYCH, MODELE BIZNESOWE.**

**KODY KLASYFIKACJI JEL: M15, M16, M40**