Digitization and robotization of accounting for business entities in the Czech Republic

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Abstract

Research background: Business entities in the Czech Republic, as well as others around the world began to realise the need of using new information technologies. More business subjects became conscious of the advantages and benefits of digitization, automatization and robotization, not only in accounting, because of the influence of Sars-Covid-19 pandemic. The concept of digitization is the use of information and digital technologies that lead to streamlining and improving processes in the areas of communication, information transfer, data availability and more. Considering the fact that nobody knows how the digital world will look like in the future, it is necessary for business entities to prepare themselves for anything to come so they will be able to react flexibly because it is obvious that the digital world affects and will affect every part of business management. **Purpose of the article:** The aim of the paper is to evaluate the level of digitization of business entities in the Czech Republic in accounting. **Methods:** To conduct the research we have used a questionnaire survey and testing of statistical hypotheses. **Findings & Value added:** The answers of respondents show that the level of digitization and the use of their services depends on their size, larger entities are using the digitization more intensively. The article is very useful, especially at a time when the Czech Republic and the world are affected by the pandemic Sars-Covid-19.

Keywords: *Accounting automation; digitization; robotization; COVID-19*

JEL Classification: *K34; M41; O32; C12*

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1 Introduction

The term robotic process automation (RPA) is associated with the digitization and automation of processes, which automates all repetitive activities at regular intervals. These are activities that are performed through computer technology. RPA is a software technology that, for example, enters characters on the keyboard, copies, pastes and moves data, performs calculations, opens e-mails, logs in to enterprise applications, or fills out forms. These routine repetitive activities are primarily for the accounting company. RPA technology communicates with enterprise applications in the same way that man must (Deloitte, 2017), (Ernst & Young, 2018) or (Slezák et al, 2019).

RPA affects both the individual and the business itself. RPA technology ensures higher quality and accuracy of accounting work, saves its time, but at the same time raises employees' fears of their possible replacement by artificial intelligence (Fernandez and Aini, 2018). RPA can also be used in auditing, more so in (Moffitt, Rozario et al, 2018) or (Allbabidi and Adnan, 2021), which deals with the influence of technological, organizational and environmental factors on the use of digital technologies and their impact on auditors.

According to (Lyford-Smith, 2019), artificial intelligence (AI), Big Data, Blockchain and cybersecurity represent technologies that transform the accounting industry and according to some studies, for example (Lee and Tajudeen, 2020) the use of AI in accounting software leads to higher productivity, effective process management and workforce optimization.

AI is machine or deep learning, which is a means of processing a large quantity of activities in a short time using computer processing capabilities. In accounting, for example, it is used to detect false business transactions or to detect errors and irregularities in a timely manner. AI can be used to predict costs or revenues and sales based on automatic visualization of quantitative risks (Yoon, 2020) or (Moll and Yigitbasioglu, 2019). Given that AI is currently over-regulated, legislators need to consider this area carefully in terms of the advantages and disadvantages of certain areas, such as human resources or liability for AI damage. A separate category is cyber data protection (Moll and Yigitbasioglu, 2019) and (Evstratov and Guchenkov, 2020).

Big Data includes large volume, speed, variety, and some authors even cite credibility. In addition to the vast amount of data, Big Data also includes various techniques that are used to analyze it. Big Data visualization programs improve the accuracy and reliability of decision-making and prediction, as well as allow you to examine unstructured data. In accounting, it is a reliable source of financial data to support business decisions (Zhang, Xiong, Xie, Fan and Gu, 2020). Big Data may provide other forms of valuation of intangible assets, including those not included in the balance sheet. At the same time, Big Data can be used to value hard-to-value assets. Alternatively, they can help in choosing a suitable depreciation method (Moll and Yigitbasioglu, 2019). According to (Warren, Moffitt, Byrnes, 2015) Big Data can provide better accounting practices.

Blockchain is an information recording technology that uses encryption to prevent forgery or other manipulation of data (Yoon, 2020). According to (Schmitz and Leoni, 2019), Blockchain technology is an Internet network that uses cryptography. In the case of Blockchain technology, accounting records are kept only once, in blocks that are accessible at any time, which reduces the cost of managing these records. Economic operations are recorded in real time and each user will have real-time access to this information. The technology does not allow unauthorized changes to the data, which leads to their accuracy and reduces the likelihood of fraud. Blockchain, on the other hand, requires confidence in this technology and closer cooperation with the information technology department. The

technology depends on the Internet connection and requires a high level of cyber security (Puognana and Dutescu, 2020).

Another trend in accounting is Cloud Computing. The official definition of Cloud Accounting does not yet exist. Its most important characteristic is that accounting services are performed without the need to install any software. Cloud accounting is used via a web browser, ie, over the Internet and allows access from virtually anywhere and from any device. All data is stored at the provider. Some of the Cloud accounting services include the automatic creation of attachments to business operations, the automatic control of accounts or the preparation of all interim reports (Dimitriua and Matei, 2014).

It follows from the aforementioned technological trends that their influence on the accounting of business entities is and will be great. The aim of the paper is to evaluate the level of digitization of business entities in the Czech Republic in accounting.

2 Methods

The test, which is able to maintain independence in the pivot table, compares the obtained (empirical) frequencies (nij) and theoretical frequencies (n´ij), which should occur in the case of independence of the observed traits. Deviations from the independence of individual fields of the pivot table are observed in Pearson's statistics G (1):

$$G = \sum_{i=1}^{r} \sum_{j=1}^{s} \frac{(n_{ij} - n'_{ij})^2}{n'_{ij}} \quad (1)$$

In order to ensure an acceptable approximation of the distribution of stated statistics for a certain number of fields in a pivot table, a range of selection n is generally required such that the expected frequencies reach a value of at least 5.

Spearman's coefficient of order correlation can be tested in the hypothesis of the independence of quantities. If the range is small, the condition of normal distribution is not met. If we have doubts about the linearity of the investigated relation of quantities X, Y, the Spearman coefficient of order correlation (2) is used:

$$r_s = 1 - \frac{6 * \sum_{i=1}^{n} d_i^2}{n * (n^2 - 1)}, \quad (2)$$

where di are the differences of the serial numbers of the ordered values of the quantities X and Y. This coefficient is also suitable for ordinal variables.

The values of the correlation coefficient lie in the interval from -1 to 1. The zero value represents the absence of a linear dependence of the monitored quantities. The sign shows us the direction of the dependence, ie whether it is a direct linear dependence or indirect (Hendl, 2015).

The data for the research were obtained on the basis of primary research, namely the method of questioning, through a questionnaire survey, which was conducted using the method of Computer Assisted Web Interviewing, ie, questioning through online questionnaires, which was sent through the Google Forms application. One hundred and twenty-nine business entities participated in the questionnaire survey. The questionnaire contained a total of 17 questions (e.g. Komora certifikovaných účetních, 2020). Respondents were mainly offered closed questions, for which the respondent had a choice of two or more pre-formulated alternative answers.

3 Results

Figure 1 shows that in 66 analyzed business entities, the method of data transmission in connection with the Covid-19 epidemic did not change, of which 64 entities submit data electronically, the rest physically. Thirty-four entities slightly changed the method of submitting documents towards the computerization. There was a significant reduction in the physical transfer of documents for 19 subjects.

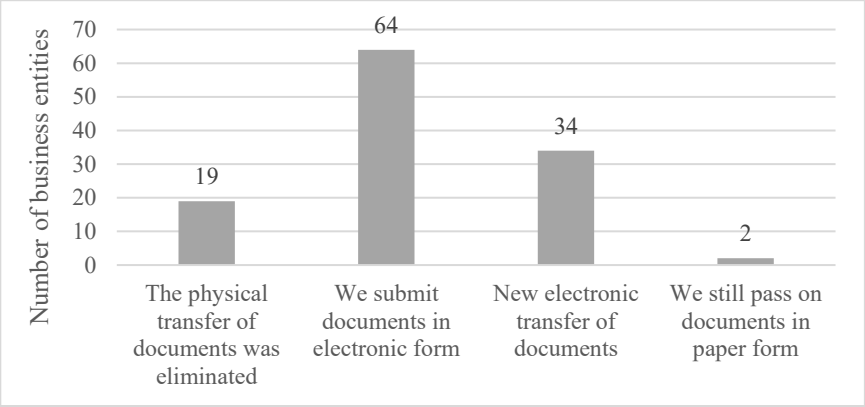

Figure 1. Answers to the question "How has the method of submitting documents for their processing changed in connection with the COVID-19 epidemic in the performance of your activities?"

Source: Own calculation

It is assumed that there is a significant relationship between the level of digitization of accounting and the size of the entity. The tested hypotheses (H) will be in the form: H0: There is no statistically significant relationship between the size of the entity and its degree of digitalization in accounting and H1: There is a statistically significant relationship between the size of the entity and its degree of digitalization in accounting. Table 1 shows the basic statistical measures of the variable "Digitization" sorted by the size of the entity. It is evident that as the size of an entity increases, so does the rate of digitization. Micro-entities have an average digitization rate of 2.5, while large entities have a digitization average of 4.2

The accountant of the analyzed company could then write specific forms that are used in digitization. Some of the respondents' answers included, for example, the use of so-called e-invoices, automated document processing, program interconnection, document extraction, document scanning, workflow, use of accounting software, etc.

Table 1. Basic statistical measures of the variable "Digitization" sorted by the size of the entity.

Rate of digitization	**Size of the accounting entity**			
	Micro	**Small**	**Medium**	**Large**
Number	14	41	30	44
Average	2,5	3,2	3,0	4,2
Minimum	1,0	1,0	2,0	2,0
Maximum	3,0	5,0	4,0	5,0

Source: Own calculation

Based on the data, the Spearman correlation coefficient was calculated (R = 0.518, P-value = 0). Since the resulting p-value is smaller than the significance level α = 5%, H_0 is rejected at this significance level. There is a statistically significant relationship between an entity's size and its degree of digitization in accounting. Since the value of the coefficient is positive, it is a positive linear relationship, ie as the size of the entity increases, the rate of digitization of its accounting increases.

It is assumed that there is a significant relationship between the enterprise information system and the size of the accounting entity. The hypotheses tested will be in the form: H_0: There is no statistically significant relationship between the size of the entity and its type of business information system and H_1: There is a statistically significant relationship between the size of the entity and its type of business information system. The micro-entities make use of the enterprise resource planning system (57.1% of entities) and simple tools as an accounting system (42.9% of entities). Small and medium sized entities most often use a combination of systems (43.9% of small companies and 53.3% of medium sized companies), large entities most often use a complete digital ecosystem (63.6% of accounting units), see Figure 2.

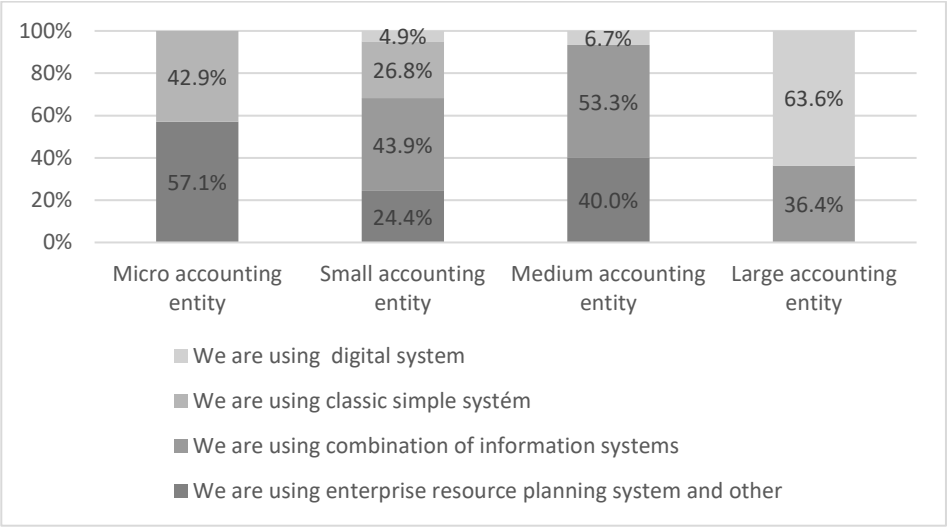

Figure 2. Answers to the question "What information system do we use?"

Source: Own calculation

To verify the existence of a statistically significant relationship between the variables, the x2 independence test in the pivot table is used. To meet the assumptions of the test, the categories of micro and small entities were combined into one category. Based on these adjusted data, the test criterion and the p-value of the test were calculated (G = 80.327, p-value = 0.003). Since the resulting p-value is smaller than the significance level α = 5%, H0 is rejected at this significance level. A statistically significant relationship between the size of the entity and the type of business information system was confirmed.

It is assumed that there is a significant relationship between the preparation of employees for digitization and the size of the entity. The hypotheses tested will be in the form: H0: There is no statistically significant relationship between the size of the entity and the preparation of employees for the transition to digitization and H1: There is a statistically significant relationship between the size of the entity and the preparation of employees for the transition to digitization. No micro-entity has prepared its employees for the transition to more intensive

digitization in the wake of the Covid-19 pandemic. Small entities prepared their employees for 27%, medium - sized entities for 23% and large entities for 57%, see Figure 3.

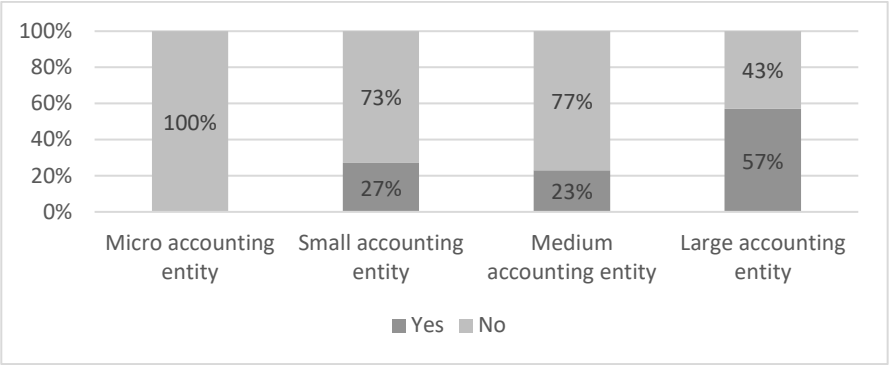

Figure 3. Answers to the question "You were preparing for the digital transition?"

Source: author calculation

The test criterion and the p-value of the test were calculated (G = 20.051, p-value = 0). Since the resulting p-value is smaller than the significance level α = 5%, H0 is rejected at this significance level. A statistically significant relationship between the size of the entity and the preparation of employees for the transition to digitization was confirmed.

4 Conclusion and discussion

Digitization and automation has been a popular topic in the last few years. The concept of digitization represents the use of information and digital technologies that lead to streamlining and improving processes in the areas of communication, information transfer, data storage. In some areas, robotics is gradually replacing the human factor. One area that cannot do without information and digital technology is accounting. The reason for introducing new technologies is the fact that these technologies can perform the same activity as humans, but more efficiently, quickly and cheaper. The aim of the paper is to evaluate the level of digitization in business entities in the Czech Republic, through a questionnaire survey. The disadvantage of the questionnaire survey is the very low return or misunderstanding of the questions by the respondent. Subsequent analysis is performed using mathematical – statistical methods. According to the survey, one of the biggest opportunities in digitization of accounting is seen primarily in the simplification of processes and also in reducing costs and increasing productivity. Concerns in this area are seen primarily in the reluctance to change established processes, the lack of financial resources, but also the threat of cybernetic attacks. Based on the testing of statistical hypotheses, it was found that there is a relationship between the size of the entity and the use of digitization options. From the results of the questionnaire survey, it can be concluded that larger entities use digitization more intensively.

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