

## The impact of digitization of the cost accounting system on organizational efficiency and effectiveness in the healthcare sector of the Republic of Serbia

### Uticaj digitalizacije sistema obračuna troškova na organizacionu efikasnost i efektivnost u zdravstvenom sektoru Republike Srbije

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#### Abstract

*The new industrial era has brought new opportunities and chances for the entire business development. Smart machines, artificial intelligence, cloud computing, the Internet of Things, big data are taking over many jobs and roles, thus leaving room for the development of new skills and abilities. The rapid technological development in terms of automation and digitization has made machines replace human work. In this sense, it is a matter of time when technology will replace traditional accountants. (Management) accountants who want to adapt and survive in the digital world have to improve their offer and change the focus from data calculation to interpretation of results and business management. Thus, by applying new digital information technology tools, management accounting can provide quality information for determining the costs of products and services, performance measurement, planning and control, strategic and operational decision-making and the like. The general objective of this paper is to review the potential impact of digital information technologies on the usefulness of cost accounting systems and organizational performance in healthcare institutions in the Republic of Serbia with the help of statistical analysis of the relationship between the selected variables. The results of the analysis show that digital technologies have a great impact on the usefulness of the cost accounting system. Also, the largest number of respondents pointed out that improved IT systems have a positive effect on increasing organizational performance.*

**Keywords:** cost accounting, digitization, healthcare, statistical analysis, strategy

#### Sažetak

*Nova industrijska era stvorila je nove mogućnosti i šanse za razvoj celokupnog poslovanja. Pametne mašine, veštačka inteligencija, cloud računarstvo, internet stvari, veliki podaci preuzimaju mnoge poslove i uloge i ostavljaju prostora za razvoj novih veština i sposobnosti. Brz razvoj tehnologije u pogledu automatizacije i digitalizacije doveo je do mogućnosti zamene ljudskog rada mašinama. U tom smislu, pitanje je vremena kada će tehnologija zameniti tradicionalne računovodstvene poslove. (Upravljačke) računovođe koje žele da se prilagode i opstanu u uslovima digitalizacije moraće da unaprede svoju ponudu, u smislu promene fokusa sa izračunavanja podataka na tumačenje rezultata i upravljanje poslovanjem. Tako primenom novih alata digitalnih informacionih tehnologija upravljačko računovodstvo može da obezbedi kvalitetne informacije za utvrđivanje troškova proizvoda i usluga, merenje učinka, planiranje i kontrolu, donošenje strateških i operativnih odluka i slično. Opšti cilj ovog rada je da se primenom odgovarajućih metoda statističke analize međusobnog odnosa odabranih varijabli preispita potencijalni uticaj digitalnih informacionih tehnologija na korisnost sistema obračuna troškova, kao i na organizacione performanse u zdravstvenim ustanovama u Republici Srbiji. Rezultati analize pokazuju da digitalne tehnologije imaju veliki uticaj na korisnost sistema obračuna troškova. Takođe, najveći broj ispitanika ističe da unapređeni IT sistemi pozitivno utiču na povećanje organizacionih performansi.*

**Ključne reči:** obračun troškova, digitalizacija, zdravstvo, statistička analiza, strategija

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## 1. Introduction

According to Bouquin (2004), an organization is efficient if it achieves the maximum output with the help of engaged resources, and if it achieves the originally defined goals, then it is also effective. In order to achieve this and be able to make relevant decisions, it needs to have precise information about costs of its processes. „High-quality management must be based on real, true, objective and relevant information“ (Cvetković et al., 2024). The role of cost accounting is of crucial importance here. In this sense, it is necessary to improve the information base to suit dynamic and unpredictable business conditions. One of the ways is to apply information and communication technologies in strategic and operational business. The reform of the public sector is based on the application of various management instruments with an emphasis on measuring the performance and quality of services, strengthening the role of managers and decentralizing the decision-making process (Zlatanović et al., 2022).

Digital transformation was caused by technologies such as artificial intelligence (AI), blockchain (BC), big data (BD), cloud computing (CC) and the Internet of Things (IoT) (Varzaru, 2022). These technologies bring cost savings, improve performance, increase competitive efficiency, economic growth and social prosperity (Nikolić, Spasić, 2023). They also facilitate the use of traditional and innovative management accounting tools. The choice of an adequate management accounting tool depends on numerous factors such as the size of the organization, national and organizational culture, staff skills and technological progress (Varzaru, 2022). Be it traditional or new cost accounting systems, digital information and communication technology significantly affects their usefulness in management accounting.

The digitization process in the Republic of Serbia started some twenty years ago, but it is proceeding very slowly. The state was not active in this process, which had a direct impact on the speed of digitization. The Digital Agenda, covering the Strategy of Electronic Communications Development in the Republic of Serbia for the period 2010-2020 and the Strategy for the Development of the Information Society until 2020, set strategic goals and development directions of digital information and communication technologies. The goal of the information society development strategy is to “increase access to information and communication technologies and simplify it for all citizens and economic entities, increase the openness and availability of the Internet and create an information society through the development of e-business, e-commerce, e-administration, e-justice, e-health and e-education” (Official Gazette of the RS, 2017).

The paper consists of three parts. The first part of the paper focuses on the analysis of digital healthcare in the Republic of Serbia with a special focus on digital technologies in cost accounting and the advantages and disadvantages of their application in the healthcare sector. The next part presents research methodology, while the final part of the paper analyzes the results of empirical

research and highlights the views of accountants in healthcare institutions of the Republic of Serbia.

## 2. Digital technologies in cost accounting and their application in the healthcare sector of the Republic of Serbia

Digitalization is defined as changing business models to use digital technologies and create opportunities to provide new sources of income or value creation. (Dengiz, 2017) An example of digital technologies is artificial intelligence, which provides a good basis for making strategic and operational decisions in organizations in the future. (Oncioiu et al., 2019) Application of AI-powered smart virtual assistants, algorithms and machine learning tools in existing organizational software and databases can lead to data manipulation. (Frana, Klein, 2021) The process of introducing artificial intelligence in accounting requires several iterations. First of all, a unique, organization-specific artificial intelligence system is designed, with special emphasis on the importance of capital investment. In the next phase, the entire organizational operation is adapted to the new business environment. What is more, direct users of the transformed accounting information system undergo specialized trainings. (Knežević et al., 2023) By applying artificial intelligence in accounting, accountants will spend less time on routine tasks and thus focus more on business decision-making, adequate application of cost accounting and its modernization in order to improve performance. (Novičević Čečević & Antić, 2021)

Big Data (BD) technology enables the collection, storage, analysis and processing of large amounts of data in various forms such as images, audio recordings, data generated by Internet of Things sensors, including patient data. (Cao et al., 2015) The benefits of applying big data technology are particularly pronounced in the healthcare sector because it is burdened with an enormous amount of data. The healthcare management system that relies on big data technology has the ability to explore data and look for correlations, established patterns and trends based on which expected future events can be extrapolated. What is more, it gives the opportunity of integration, collaboration and data and process sharing between different departments and institutions, as well as the possibility of integrated monitoring of all medical history in the entire healthcare system. (Cozzoli et al., 2022)

Cloud computing technology (Cloud computing - CC) builds on big data technology and enables data storage in some Internet niche, while Blockchain technology ensures transparency, reliability and access to this information in real time by storing it in a block of records linked to other blocks of records using cryptography. (Onyshchenko et al., 2022) Cloud computing makes room for cloud accounting and brings some advantages. Namely, it provides flexible access to financial information in real time on any device with an Internet connection, information is created in real time and no software update is necessary because information is automatically updated and archived. (Petrova, 2018)

The Internet of Things is another digital technology that allows for effective control of healthcare metrics, inventory management and efficient service delivery thanks to remote monitoring of healthcare services. (Pandya, Kumar, 2022) Blockchain-enabled IoT technology protects data security and confidentiality in the process of remote monitoring of healthcare services over the Internet using remote sensing and Blockchain Hyperledger. (Jamil et al. 2020)

Therefore, digitization imposes the need to review management accountants' existing competences and adjust them to current circumstances. In the era of digitization, the role of traditional accounting is changing and "evolving from the traditional emphasis on financially oriented decision analysis and budgetary control to a more strategic approach that emphasizes the identification, measurement, and management of the key financial and operational drivers of shareholder value". (Appelbaum et al., 2017; Ittner, Larcker, 2001) Owing to the wider use of information produced by innovative management accounting, organizations achieve better performance. (Piosik, 2022)

Digitization process in our country is proceeding slowly. The general goal of digitization of Serbian healthcare system is the safe use of services and technologies for more efficient and accessible high-quality healthcare. (Ministarstvo zdravlja Republike Srbije, 2022) After the Action Plan for the Implementation of the Regulation on the Program of Work, Development and Organization of the Integrated Health Information System "e-Zdravlje" expired in 2015, a new cycle of healthcare information system reform was launched. The Public Health Strategy in the Republic of Serbia from 2018-2026 (Official Gazette of the RS, 2018) and the Electronic Government Development Program in the Republic of Serbia from 2023-2025 (Official Gazette of the RS, 2023) established a valid strategic framework for the implementation of digitization in the healthcare system.

The strategic control and monitoring of the digitization process in the healthcare system of the Republic of Serbia is entrusted to the coordination body. Regardless of the aforementioned regulatory framework, responsibilities and powers have not yet been precisely defined in our country, nor has a single and comprehensive organization for managing the digitization process in healthcare been established. In addition, insufficient institutional knowledge of digitization in this sector and scarce personnel capacities create additional difficulties when implementing this process. For the successful implementation of the digitization process in healthcare, it is necessary to reorganize business in terms of legal, organizational and personnel aspects, hire people with adequate knowledge and skills to manage this process, and train citizens on how to use e-health services.

Existing software solutions in healthcare institutions allow input of non-standardized text of different quality levels, which limits the amount of machine-readable data needed for research, analysis, reporting and improvement

of all aspects of healthcare system. There is also the problem of financing digitization and the lack of professional technical personnel to support the process. Continuous employee training programs on software application in the healthcare sector have not been defined, nor have programs to increase information literacy. Software is not user-oriented because it was designed without interaction with end users. Also, it is necessary to ensure a uniform level of IT literacy of the citizens themselves so that they can use e-health services. (<https://www.zdravlje.gov.rs/>, 2022) In addition, the digitization process in healthcare also faces challenges related to data privacy, availability and compatibility. Healthcare institutions have different database formats, which makes it difficult to exchange data. (Sitarević et al., 2022) It should be borne in mind that the healthcare system is complex and that each healthcare institution performs a large number of specific processes of varying levels of complexity and diverse activities, so digitization requires a multisectoral approach.

Although the digitization of finance in the healthcare sector started in 2020, it related to the introduction of the general ledger and payments in the RFHI (SAP), the "Finance Portal" for centralized public procurement, contracting, requisition, expenses and supplies, automatic invoice control in RFHI, which are downloaded from SEF and posted in SAP (UniOut) and the eReceipt system, which allows timed dosing of therapy when approving prescription drugs (Vlada Republike Srbije/, 2023).

Digitization in healthcare has not yet touched the aspects of management accounting. It is especially important to reorganize the existing accounting, given that digitization brings a significant number of intangible resources, new technologies and requires changes in the existing personnel potential. It is desirable to introduce strategic management accounting because traditional accounting in the digital environment becomes dysfunctional. (Onyshchenko et al., 2022).

Based on all the above, one can say that the digitization process in our country is still ongoing, especially in the healthcare sector, that the regulatory framework covering the digitization of management accounting and cost accounting has not been defined. There are papers that deal with this subject, but they primarily focus on the manufacturing sector (Knežević et al., 2021; Knežević et al., 2023) or on the introduction of new Industry 4.0 technologies in the field of healthcare, without touching upon management accounting (Sitarević et al., 2022). Therefore, in this paper we will try to provide answers to the following research questions:

- Do finance and accounting employees in healthcare institutions believe that the application of digital information technologies has an impact on data security, trust, speed, adjustment and accessibility?
- Do respondents think that the application of digital information technologies has an impact on cost accounting systems?
- Do respondents think that the implementation of improved cost accounting systems under the

influence of digital information technologies has a positive impact on organizational performance?

- Is there a positive correlation between accuracy, intensity of application and satisfaction with current cost accounting systems for strategic and operational decision making?

### 2.1. Methodology of empirical research

The research objective is to assess the views of accountants and other employees working in Serbian healthcare institutions' finance sectors on how digitization of the cost accounting system can affect organizational efficiency and effectiveness. Research shall proceed from the following hypotheses:

- Hypothesis 1: According to users, the most important determinants of the application of digital information technologies in the cost accounting system are speed, adjustment and accessibility.
- Hypothesis 2: The application of digital technologies in cost accounting has an impact on the usefulness of individual accounting systems.
- Hypothesis 3: The application of digital technologies in individual cost accounting systems affects organizational efficiency.
- Hypothesis 4: Digitization of certain cost accounting systems can improve organizational effectiveness.
- Hypothesis 5: Improvement of organizational efficiency by digitization of individual cost accounting systems increases organizational effectiveness.

Empirical research was conducted by surveying employees in Serbian healthcare institutions' finance and accounting sectors. Survey questions were created based on previous research conducted worldwide (Varzaru, 2022; Alshamlan, Zverovich, 2018). The survey was conducted in January 2024, first electronically by sending the questionnaire via email, and then, following the initiative of more than 80% of respondents, the survey was filled out by on-the-phone consultations with the authors. The questionnaires were sent to finance and accounting units and directors of healthcare institutions with the indication that the questionnaire be filled out by the person in charge of monitoring finance and accounting operations. Of 100 questionnaires sent, a total of 60 questionnaires were collected for the purpose of researching the opinions of experts in the field of accounting.

Respondents gave answers to 40 questions in the questionnaire. The first part of the questionnaire referred to questions about the location, type of healthcare institution, number of employees and number of hospital beds in general hospitals, while for primary health centers the number of insured persons was taken. Then questions on socio-demographic characteristics of the respondents followed (gender, age, education, workplace, length of service in the same or similar position). Furthermore, there were questions on the application, accuracy and satisfaction with the information portfolio of the cost accounting system, the analysis of the cost structure, as

well as the impact of digital information technologies on the usefulness of the cost accounting application for making strategic and operational decisions. A Likert scale with items from 1 (which expresses the least agreement with the item) to 5 (which expresses the greatest agreement with the item) was used to evaluate the respondents' answers. Some characteristics of the given sample are presented in Table 1.

**Table 1.** Some characteristics of the sample

Variables	F	Valid %	Cumulative %
<b>Region</b>			
Belgrade region	2	3.33	3.33
Vojvodina region	23	38.33	41.67
Šumadija and Western Serbia region	22	36.67	78.33
Southern and Eastern Serbia region	13	21.67	100.00
<b>Type of institution</b>			
Primary Health Center	48	80.00	80.00
General Hospital	12	20.00	100.00
<b>Employees in primary health centers</b>			
56-128	25	52.08	52.08
129-200	10	20.83	72.92
201-272	5	10.42	83.33
273-344	1	2.08	85.42
345-416	1	2.08	87.50
417-488	2	4.17	91.67
489 and more	4	8.33	100.00
<b>Employees in general hospitals</b>			
353-682	7	58.33	58.33
683-1011	2	16.67	75.00
1012-1340	2	16.67	91.67
1341 and more	1	8.33	100.00
<b>Number of person insured in primary health centers</b>			
6.532-23.594	28	58.33	58.33
23.595-40.656	9	18.75	77.08
40.657-57.718	1	2.08	79.17
57.719-74.780	6	12.50	91.67
74.781-91.842	-	-	91.67
91.843-108.904	2	4.17	95.83
108.905 and more	2	4.17	100.00
<b>Number of hospital beds in general hospitals</b>			
150-520	8	66.67	66.67
521-890	3	25.00	91.67
891-1.260	-	-	-
1.261-1.630	-	-	-
1.631 and more	1	8.33	8.33

Source: Author's calculation based on SPSS 20.0

Table 1 shows a dominant share of healthcare institutions from the Region of Vojvodina (38.33%) and the Region of Šumadija and Western Serbia (36.67%), while the share of the Belgrade Region is the smallest and amounts to 3.33%. Among the observed healthcare institutions, the majority are primary health centers (80.00%), while the share of general hospitals is significantly lower (20.00%). Around 73% of surveyed primary health centers have less than 200 employees, while 75% of general hospitals have less than 1011 employees. The largest number of primary health centers has up to 23,594 insured persons, while the largest number of hospitals (66.67%) has less than 520 hospital beds. An overview of the socio-demographic characteristics of the respondents is given in Table 2.

**Table 2.** Socio-demographic profile of respondents

Variables	F	Valid %	Cumulative %
Gender			
Male	11	18.30	18.30
Female	49	81.70	100.00
Age			
30-35	3	5.00	5.00
36-40	10	16.70	21.70
41-45	11	18.30	40.00
46-50	12	20.00	60.00
51-55	10	16.70	76.70
56-60	6	10.00	86.70
61-65	8	13.30	100.00
Education			
Secondary school	1	1.70	1.70
College	9	15.00	16.70
Faculty – basic academic studies	27	45.00	61.70
Faculty – master academic studies	21	35.00	96.70
PhD	2	3.30	100.00
Occupation			
Head of the economic and finance unit	8	13.33	13.33
Auditor	1	1.67	15.00
Financial analyst	21	35.00	50.00
Accountant	23	38.33	88.33
Head of finance and accounting department	5	8.33	96.66
Head of accounting	2	3.34	100.00
Work experience			
2-7	10	16.70	16.70
7.1-12	11	18.30	35.00
12.1-17	7	11.70	46.70
17.1-22	10	16.70	63.30
22.1-27	10	16.70	80.00
27.1-32	5	8.30	88.30
32.1 and more	7	11.70	100.00

Source: Author's calculation based on SPSS 20.0

Out of the total number of respondents, 81.70% of respondents are female. The largest number of respondents are from 46 to 50 years old, while one half of respondents are younger and the other half are older. Out of the total number of respondents, 80% have completed university, where the share of those who have completed basic academic studies is higher and is 45%, while 35% of respondents have completed master academic studies. Only 1.70% of the respondents have completed secondary school, and twice as many have a doctorate. If we look at the occupation, the largest number of respondents work as accountants (38.33%) and financial analysts (35.00%). Also, the largest number of respondents has a working experience between 7 and 12 years (18,30%).

The collected data from the questionnaire was analyzed using the statistical package for social sciences IBM SPSS Statistics 20.0 (Statistical Package for Social Sciences - SPSS, Version 20.0). Reliability and internal consistency of variables were measured using Cronbach's Alpha coefficient. Descriptive statistics was used to measure central tendency (arithmetic mean, median, mode) and variability (standard deviation). Before the actual statistical analysis of the data, it was necessary to check whether the observed variables have a normal distribution. Checking the normality of distribution of variables was performed with the help of computational (Kolmogorov-Smirnov test and Shapiro-Wilk test). As it was not possible to apply the Pearson's correlation coefficient analysis, we used non-parametric test, the Spearman Rank Order Correlation Coefficient.

**2.2. Research results and discussion**

We calculated the value of the Cronbach's Alpha coefficient for each question to which the respondent had to answer by circling the number on the Likert scale. With this coefficient, we examine the internal agreement of the scale, i.e., its reliability (Pallant, 2011). Ideally, the value of this coefficient should be greater than 0.7 (DeVellis, 2003). All obtained results in our case are greater than 0.7, so we can conclude that the internal consistency of the analyzed scales is considered acceptable.

After the reliability check, we test the normality of distribution of the used variables. To test the normality of distribution of variables, we used skewness and kurtosis, as well as the Kolmogorov-Smirnov and the Shapiro-Wilk tests. The criterion for confirming the assumption of normality of distribution in the Kolmogorov-Smirnov test and the Shapiro-Wilk test is a significance level (Sig.) greater than 0.05 (Manasijević, 2011). Based on the results of the computational methods, we concluded that the data do not have a normal distribution, so for the purposes of further research, we decided to use a non-parametric alternative for the Pearson's correlation coefficient analysis, the Spearman Rank Order Correlation Coefficient.

Table 3 shows the respondents' opinion on the application of digital technologies in cost accounting in healthcare institutions. Respondents used Likert scale to score the extent to which the application of digital technologies affects: higher trust in CAS, higher cost accounting security, shorter cost accounting time and easier implementation and accessibility of the applied cost accounting system.

**Table 3.** Descriptive Statistics – To what extent the application of digital technologies affects CAS

Cronbach's Alpha = 0,921							
Does the application of digital technologies affect:	N	Min	Max	M	SD	Med.	Mod.
Higher trust in CAS	60	1	5	3.80	0.819	4	4
Higher cost accounting security	60	1	5	3.83	0.977	4	4
Shorter cost accounting time	60	1	5	4.25	0.836	4	4
Easier implementation of CAS	60	1	5	4.00	0.803	4	4
Easier accessibility of CAS	60	1	5	4.20	0.777	4	4

Source: Author's calculation based on SPSS 20.0

The analysis of the possibility of business improvement using digital technologies shows that, for respondents, the biggest contribution of digitization lies in shorter time of cost accounting (M=4.25). That is, viewed on the Likert scale, the most common rating given by the respondents is 4 (Mo=4). Respondents also believe that the application of digital technologies will make CAS accessibility (M=4.20) and implementation (M=4.00) easier. According to respondents, the application of digital technologies will have the least impact on trust in the cost accounting system (M=3.80). Table 3 shows that employees working in healthcare organizations' finance sectors in lost cases gave a rating 4 to questions (Mo=4), which shows that the respondents largely agree that business digitization can significantly improve the process

and the accounting system itself. Also, in all the items, the standard deviation values are below 1 ( $\sigma < 1$ ), so we conclude that the respondents largely agree with the ratings of the observed variables. Based on the obtained results, we can conclude that hypothesis 1 has been proven, and the obtained results are in accordance with the results of another research conducted worldwide. (Varzaru, 2022)

In Table 4, the authors wanted to show the influence of digital information technologies on the usefulness of certain cost accounting systems in healthcare institutions in the Republic of Serbia. The results of the descriptive statistical analysis are as follows.

**Table 4.** Descriptive Statistics - The impact of digital information technologies on the usefulness of CAS

Cronbach's Alpha = 0,929							
Does the application of digital technologies increase:	N	Min	Max	M	SD	Med.	Mod.
Usefulness of CAS – actual costing	60	1	5	3.78	0.904	4	4
Usefulness of CAS – standard costing	60	1	5	3.47	0.965	4	4
Usefulness of CAS - standard variable costing	60	1	5	3.45	0.928	3.50	¾
Usefulness of CAS activity-based costing	60	1	5	3.55	0.872	4	4
Usefulness of CAS – target cost	60	1	5	3.48	0.965	4	4
Usefulness of CAS – Kaizen costing	60	1	5	3.35	1.039	3.35	4
Usefulness of CAS - product lifecycle costing	60	1	5	3.35	1.039	4	4

Source: Author's calculation based on SPSS 20.0

Observing all cost accounting systems, the respondents rated the impact of digital information technologies on the usefulness of the actual costing system as the best (M=3.78; Me=4; Mo=4). Of the new cost accounting systems, the impact of digital technologies on the usefulness of activity-based costing was rated best (M=3.55; Me=4; Mo=4). Of the traditional accounting systems, the impact on the usefulness of digital technologies on standard variable costing got the lowest rating (M=3.45; Me=3.50; Mo=¾;  $\sigma=0.928$ ), while of the new cost accounting systems, the impact on the usefulness of kaizen costing got the lowest rating (M=3.35; Me=3.35; Mo=4;  $\sigma=1.039$ ), followed by product lifecycle costing. The value of the standard deviation points to the conclusion that the respondents largely agree with the given ratings ( $\sigma \approx 1$ ). Based on the

median value and the mode of the mentioned cost accounting systems, we conclude that half of the respondents believe that digital information technologies have a very large impact, while the majority of respondents believe that they have a large impact on the usefulness of individual cost accounting systems, thus proving hypothesis 2.

Since organizational efficiency and effectiveness are two key indicators of the organization's success, we proceed to examine whether the application of digital technologies in individual cost accounting systems can improve organizational efficiency. We viewed efficiency as a way of carrying out business processes in an organization or an effort to get things done in the best possible way with the lowest possible costs.

**Table 5.** Descriptive Statistics – The impact of the digital transformation of CAS on organizational efficiency

Cronbach's Alpha = 0,966							
Is organizational efficiency affected by the application of digital technologies in CAS:	N	Min	Max	M	SD	Med.	Mod.
Organizational efficiency - CAS - actual costing	60	1	5	3.73	0.821	4	4
Organizational efficiency - CAS - standard costing	60	1	5	3.50	0.930	4	¾
Organizational efficiency - CAS - standard variable costing	60	1	5	3.47	0.965	4	3
Organizational efficiency – CAS - activity-based costing	60	1	5	3.50	0.930	3.50	3
Organizational efficiency - CAS - target costing	60	1	5	3.43	1.047	3.50	3
Organizational efficiency - CAS - Kaizen costing	60	1	5	3.33	1.020	3	3
Organizational efficiency - CAS - product lifecycle costing	60	1	5	3.38	1.010	3	3

Source: Author's calculation based on SPSS 20.0

Respondents had divided opinions on whether digitization of individual cost accounting systems can improve organizational efficiency. Employees working in healthcare organizations' finance departments gave the highest average rating to the actual costing system (M=3.73; Me=4; Mo=4;  $\sigma < 1$ ). This is understandable

because all the healthcare organizations in the research apply this accounting system and know it best, so they are competent to judge its improvement.

Then, the respondents gave good ratings to activity-based costing (M=3.50; Me=3.50; Mo=3;  $\sigma < 1$ ) and standard

costing (M=3.50; Me=4; Mo =3/4;  $\sigma < 1$ ). As for other cost accounting systems, the respondents said that they do not have an opinion on whether the digital improvement of that accounting system will improve organizational efficiency (Me=3; Mo=3). The results of this analysis show that hypothesis 3 is partially accepted, and that the results of our research are in accordance with the results

of research conducted worldwide (Varzaru, 2022; Betto at al. 2022; Bohm at al. 2021).

Effectiveness means achieving the desired outcomes that are defined in advance, so we proceed to examine the attitudes of accountants on whether the application of digital technologies in cost accounting can improve organizational effectiveness.

**Table 6.** Descriptive Statistics - The impact of the digital transformation of CAS on organizational effectiveness

Cronbach's Alpha = 0,966							
Is organizational effectiveness affected by the application of digital technologies in CAS:	N	Min	Max	M	SD	Med.	Mod.
Organizational effectiveness – CAS – actual costing	60	1	5	3.83	0.806	4	4
Organizational effectiveness - CAS - standard costing	60	1	5	3.52	0.911	3.50	3
Organizational effectiveness - CAS - standard variable costing	60	1	5	3.52	0.892	3	3
Organizational effectiveness - CAS - activity-based costing	60	1	5	3.60	0.867	4	3
Organizational effectiveness - CAS - target costing	60	1	5	3.37	1.073	3	3
Organizational effectiveness - CAS - Kaizen costing	60	1	5	3.37	1.057	3	3
Organizational effectiveness - CAS - product lifecycle costing	60	1	5	3.35	1.055	3	3

Source: Author's calculation based on SPSS 20.0

Also, when it comes to organizational effectiveness, respondents rated actual costing as best (M=3.83; Me=4; Mo=4;  $\sigma < 1$ ), followed by activity-based costing (M=3.60; Me=4; Mo=3;  $\sigma < 1$ ), while they gave the lowest rating to product lifecycle costing (M=3.35; Mo=3;  $\sigma \approx 1$ ). The extent to which respondents favor actual costing compared to other systems is shown by the range of ratings from 2-5. The respondents gave a rating 1 to all other cost accounting systems. As for the remaining cost accounting systems, the highest number of respondents stated that they do not have an opinion on the impact of improved cost accounting systems on organizational effectiveness (Me=3; Mo=3). The value of the standard deviation points to the conclusion that the respondents largely agree with the given ratings ( $\sigma \approx 1$ ). Based on the results of this analysis, we can say that hypothesis 4 is partially accepted. The results of our research are in

accordance with the results of research conducted worldwide (Varzaru, 2022; Betto at al. 2022; Bohm at al. 2021).

In order to examine in more detail, the impact of the application of digital technologies in individual cost accounting systems on organizational efficiency and effectiveness, we applied correlation analysis. With this we wanted to examine the relationship, as well as the strength and direction of that relationship between the variables. For our analysis, we used Spearman's rank coefficient, because, as we mentioned, there is no normality of distribution of the observed variables. The results of the correlation analysis of the impact of digitally improved cost accounting systems on organizational efficiency and effectiveness are given in Table 7.

**Table 7.** The influence of digital information technologies

Correlation coefficient	
N=60	Organizational effectiveness - CAS – actual costing
Organizational efficiency - CAS actual costing	Spearman's rho 0.902
	Sig. (2-tailed) 0.01
N=60	Organizational effectiveness - CAS - standard costing
Organizational efficiency - CAS - standard costing	Spearman's rho 0.927
	Sig. (2-tailed) 0.01
N=60	Organizational effectiveness - CAS - standard variable costing
Organizational efficiency - CAS - standard variable costing	Spearman's rho 0.904
	Sig. (2-tailed) 0.01
N=60	Organizational efficiency - CAS - activity-based costing
Organizational effectiveness – CAS - activity-based costing	Spearman's rho 0.841
	Sig. (2-tailed) 0.01
N=60	Organizational effectiveness - CAS - target costing
Organizational efficiency – CAS - target costing	Spearman's rho 0.828
	Sig. (2-tailed) 0.01
N=60	Organizational effectiveness - CAS - Kaizen costing
Organizational efficiency - CAS - Kaizen costing	Spearman's rho 0.820
	Sig. (2-tailed) 0.01
N=60	Organizational effectiveness - CAS - product lifecycle costing
Organizational efficiency - CAS - product lifecycle costing	Spearman's rho 0.784
	Sig. (2-tailed) 0.01

Source: Author's calculation based on SPSS 20.0

Table 7 shows that Spearman's rank correlation coefficient ( $r_o$ ) is greater than 0.7 for all variables, so we conclude that there is a strong and positive relationship between our variables. Given that the respondents rated highly the item saying that the digitization in individual cost accounting systems affects organizational efficiency, it is expected that they will also rate highly its impact on improving organizational effectiveness. The strongest relationship was observed with the standard costing system ( $r_o=0.927$ ), while the weakest relationship was observed with product lifecycle costing ( $r_o=0,784$ ).

### 3. Conclusion

Only in the last couple of years have Serbian authorities taken an active part in the digitization process. The more active involvement of the state and the COVID-19 virus pandemic had a positive effect and accelerated the digitization process, primarily in the healthcare sector. Although a lot is under way in the healthcare digitization, digitization of finance started in 2020 and is mainly related to issues of financial reporting and inventory and material accounting, neglecting the segment of management accounting. Given that the application of management accounting in the healthcare sector is not mandatory, it gives more freedom when designing it. 81.67% of respondents use actual costing, while the remaining respondents stated that they do not apply any cost accounting system, nor management accounting. They believe that existing accounting systems provide relevant information, as well as that information coming from management accounting and cost accounting is used when making strategic and operational decisions.

Some healthcare institutions in our country still apply traditional actual costing due to insufficient professional knowledge and skills of employees, lower costs of system implementation and maintenance, time consumption and lack of adequate digital prerequisites for the application of innovative cost accounting systems. Employees in healthcare institutions' finance and accounting sectors believe that digital technologies affect most the speed and accessibility of information, as well as the adjustment of the cost accounting system. Also, they point out that digital technologies have a great impact on the usefulness of the cost accounting system, while the majority of respondents positively assessed the contribution of IT improved cost accounting systems to higher organizational performance.

When conducting the survey, a large number of respondents drew our attention to the fact that the survey contained two same questions. but in fact, they were different because one question related to the impact of the application of IT improved cost accounting systems on organizational efficiency, and the other on organizational effectiveness. After clarification of the questions and given concepts, the respondents gave their answers. Based on that, we assumed that they basically do not understand the given concepts and do not differentiate between them. Therefore, we could expect them to give fairly uniform answers to these questions. The results of the correlation

analysis showed that our assumption was correct. About 2/5 of respondents did not have an opinion on the impact of IT improved cost accounting systems on organizational efficiency and effectiveness, while 47-50% of respondents estimated that their impact is great.

The paper represents a contribution to the literature on examining the potential for the application of digitally improved cost accounting systems in the field of healthcare. However, the research has certain limitations. One limitation of this study is related to the sample size. Given that the respondents expressed their views on the questions in the survey, there was subjectivity present, making it the second limitation of the research. Another limitation relates to the number of questions and the scope of the survey. Also, the very wording of the question with the answers offered does not give the respondents much space to explain their answers in more detail. In order to eliminate these limitations, it is recommended to expand the list of questions and to allow respondents to formulate their own answers, as well as to try to conduct the survey through interviews in order to examine in more detail respondents' views regarding this topic.

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