

IMPACT OF DIGITALIZATION ON THE CHANGES IN MANAGEMENT ACCOUNTING IN SMEs: THEORETICAL ASSUMPTIONS

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Summary

Traditional management accounting is no longer in line with the changing business environment, and the need for managers to react quickly and make decisions as quickly as possible in terms of digitalization. Management accounting is applied for efficient and purposeful decision-making at different levels of management. Meanwhile, digitalization in companies is accelerating and simplifying the generation of this information. Thus, an attempt to reconcile these two research areas - management accounting and digitalization - can lead to results that facilitate business operations in a chaotic environment. A systematic literature review approach was used to disclose the impact level of digitalization on the changes in management accounting in SMEs. Results revealed possible theoretical assumptions of the impact of digitalization on management accounting changes in SMEs.

Keywords: management accounting, digitalization, SMEs.

Introduction

In today's ever-changing environment, it is necessary to keep up with the prevailing trends to remain competitive. In order to function purposefully and successfully, business leaders must respond as effectively as possible to various changes, both in the market and within the company. For this reason, management accounting solutions were integrated into the companies, which enable companies to more accurately measure the costs they incur, objectively assess their necessity, and make appropriate decisions to improve the company's performance. However, in the current environment, information flows are quite large or the data is too aggregated. Digitization can affect the ability to properly prepare the information needed by management accountants to support their decisions.

Considering that several literature reviews have been separately analyzing digitalization (Kaya, Turkyilmaz & Birol (2019), Rikhardsson & Yigitbasioglu (2018), Seasongood (2016)) and management accounting (Maas, Schaltegger, Crutzen, 2016), this paper differs from previous literature research as it focuses on the impact of digitalization to the changes of management accounting in SMEs. What is more, most often, digitalization is analyzed taking into account the large companies, as it is easier for them to implement digitalization. However, SMEs (especially in the European Union) are essential to fostering economic growth. On the other hand, traditional management accounting is no longer in line with the changing business environment, and the need for managers to react quickly and make decisions as quickly as possible. Information technology is increasingly developing in the world, resulting in more and more innovative programs that facilitate various processes. Therefore, there is a lack of managerial solutions in the scientific literature that would allow determining the impact level of digitalization on the changes of management accounting in SMEs. Hence, the **research problem** is formulated as a question: what could be the theoretical assumptions to determine the impact of digitalization on the changes in management accounting in SMEs. Due to this, the **aim of the paper** is to determine the theoretical assumptions for disclosing the impact of digitalization on the changes in management accounting in SMEs by using a systematic literature review analysis. To achieve this goal, the **main tasks** are:

1. To disclose the digitalization and its value for the organization;
2. To reveal the management accounting and its value for the organization;
3. To prepare the theoretical assumptions of the impact of digitalization on the changes in management accounting.

To accomplish all three research tasks while achieving the research aim will be used the systematic literature review method. The **research object** is the impact of digitalization on the changes in management accounting.

Research methods

This research aims to determine the theoretical assumptions for disclosing the impact of digitalization on the changes in management accounting in SMEs. Therefore, the nature of this research is explanatory. Our research strategy is focused on the application of the **systematic literature review method** by analyzing scientific publications in the

research fields of management accounting and digitalization. The period of the analysis is between 2012 and 2021. Searching for scientific publications has been done in online scientific databases such as ScienceDirect, Scopus, Web of Science. Their suitability for analysis was assessed by reviewing the titles, abstracts, and all texts of the publications enabling content analysis and focusing on main keywords, such as management accounting and digitalization. Publications that present empirical quantitative research and present results revealing the impact of digitization on changes in management accounting are considered suitable for systematic analysis.

Research results

Over the years, management accounting has significantly changed, and due to this, the role of management accountants also has changed. According to a 2015 study by PwC, accounting clerks and bookkeepers comprised the first profession most likely to be affected by digitalization in the next 20 years. The increasing use of digital technologies has a major impact on companies' productivity. European Commission (2015) highlighted that the "smart use of ICT is an important success factor for the competitiveness of European companies, for small and medium enterprises (SME)". The use of digital technologies in companies leads them to digitalization, which focuses on the optimization of organizational processes through the use of technologies to improve performance. Reflecting on the argumentation that companies are confronted with various challenges in the implementation of digitalization, it is noticed that digitalization issues concerning management accounting in the context of SMEs are still significantly under-researched.

Digitalization and its value for the organization. Digitalization is now a critical initiative for almost all companies. Bloching et al (2015) interpreted digitalization as the "continuous interconnection of all business sectors and the actor-side adaptation to the requirements of the digital economy". Similar views are shared by Hänninen, Smedlund & Mitronen (2017) digitalization "causes retail to be more data-driven and competing against the global platform leaders requires managers to understand the new business models and their implications for the industry in detail". Digitalization for Gölzer & Fritzsche (2017) means the encoding of data in digital formats; data that has previously not been available for digital data processing thus becomes available, whilst Matzler et al (2016) define digitalization as the combination of different technologies, which opens unforeseen possibilities and offers the potential to create radically new products and services. It is noticed that digitalization is used to describe any changes in the organization due to the increasing use of digital technologies to improve both the performance and the scope of the business (Westerman et al, 2011). Digitalization first, was technical evolution, and now it is a phenomenon that can impact any kind of organization. This effect is often positive – by enhancing organizational performance (Gu & Jung, 2013) and improved process efficiency and quality, by accessing new market opportunities, gaining new knowledge regarding their customers, and improving new product development processes more effectively (Setia et al, 2013), by effective information use in enterprises and drive better business performance (Marchand et al, 2002), experiencing optimized resource utilization, reduced costs, increased employee productivity and work efficiency, optimized supply chains, increased customer loyalty and satisfaction, to name but a few (Loebbecke & Picot, 2015), increased staff productivity (European Commission, 2015), etc. Nevertheless, there are many challenges for companies to succeed in achieving these results and the total commitment of all companies (especially SMEs). Several key challenges can be mentioned as fast-changing customer needs, international competition, or technological change (Lederer et al, 2017); the need for big organizational change in all aspects i.e. organizational structures, culture, horizontal and vertical integration, organizational and personnel competencies, management styles, human resource practices and other, confirming the existence of internal challenges (Imran et al, 2019); the fear of spending money on new technology (Kerravala, 2017); the need for training and education to improve new professional skills and knowledge (Colombo, Mercurio & Mezzanzanica, 2019; European Commission, 2015). Of course, there are more challenges, but the main challenges reveal the need for change, which can take the form of a change in the digital infrastructure or a change in human competencies.

Each organization accepts the challenges differently, therefore, the level of development of digitalization varies. Research results show that digitalization has widely been analyzed in the context of business companies (World Economic Forum, 2016) and the most relevant issues in implementing, using, or adapting to digitalization (De Carolis, Macchi, Negri, & Terzi, 2017) with the main purpose to measure and indicate the progress towards digitalization. Based on the analysis of digitalization models, it is noted that a very large number of digitalization models are distinguished, and detailed analysis is necessary. For the sake of simplicity, the most common three stages of digitization are distinguished:

- Initiated digitalization. This stage shows the use of IT as a tool to support their business and reflects the lowest state of digitalization in which an organization defines itself as an initiator to become a digitally driven company in the future;
- Integrated digitalization. This stage shows that the organization tries to develop digital solutions and reflects the organization's aim to support the business activity with IT;
- Digitally driven digitalization. This stage shows that all the activities of the organization become data-driven. What is more, this stage reflects the IT use in each activity of the organization.

With the developments in digitalization that provide a lot of possibilities, especially such as access to more data and data types, larger data storage, and better computational power, it is noticed that not all areas of business activity make effective use of it. For example, one previous research showed that the nature and scope of managerial accounting have not developed to take advantage of digital technologies (Gartner, 2016).

Management accounting and its value for the organization. International Federation of Accountants (1998) defines management accounting as “a specialized field of accounting which focuses on information for managerial planning, evaluating, and controlling in organizations“. Management accounting as a field is very wide with a huge variety of models. The choice and application of management accounting models are influenced by the nature of the organization’s operations, which results in the creation and application of the most effective management accounting system. Rikhardsson & Yigitbasoglu (2018) noted that in conceptualizing management accounting, four main elements are defined:

- the overall tasks of the management accounting function, which comprise planning, control, performance measurement, transaction processing, reporting, and decision support.
- the specific management accounting techniques that are used in carrying out management accounting tasks, such as activity-based costing, balanced scorecard frameworks, volume-based allocation of costs, strategy maps, zero-based budgeting, and forecasting.
- the organization of management accounting, which includes the roles of the management accountants in organizations and how management accounting functions are organized across industries, cultures, and organizational types.
- the impact management accounting has on organizational behavior and management’s perception of management accounting issues.

But traditionally, management accounting is the primary support for decision-making and control in an organization.

According to Appelbaum et al (2017), and Ittner & Larcker (2001) the role of managerial accounting is changing by “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“. This also is stressed by Kocsis (2019), who noted that the design and implementation of systems in accounting research have had a tremendous impact on both research and practice. Kocsis (2019) argued that effective design, implementation, and use affect many stakeholders including governments, system users, and developers.

In general, the goal of management accounting is to provide managers with accounting information. However, it is obvious, that large companies with the resources at their disposal are better able to overcome the decisive challenges of digitization and achieve the main goal of management accounting. SMEs as a sector play a crucial role in the economic growth in both developing and developed countries (Mitchell & Reid, 2000), Therefore, often SMEs are considered the driving force in most economies, responsible for employment, innovation, and growth, as often argued by the Organization for Economic Co-Operation and Development (OECD), the European Union, and national governments (Messner, 2016; Nandan, 2010). Similar to large organizations, SMEs also face issues related to effective use of management accounting to ensure business success in these very changing times, due to this management accounting can be regarded as value-added accounting knowledge for SMEs to assist them in improving their managerial functions since management accounting incorporates and emphasizes both financial and non-financial information, needed for the decision-making. Thus, management accounting is indeed important to support business functions (Lavia Lopes & Hiebl, 2015).

Taking into account SMEs, it was noticed that management accounting is still more widely discussed at the scientific level and it is (in some cases) complicated to apply it in practice because of the abundance of literature available on management accounting, which makes it difficult to find truly qualitative work that can understand the nature of management accounting and its opportunities and threats from the point of view of SMEs. Therefore, it becomes relevant to analyze the impact of digitalization on the changes in management accounting in SMEs.

Impact of digitalization on the changes of management accounting. Management accounting is applied for efficient and purposeful decision-making at different levels of management. The main purpose of management accounting is to provide information that is useful to them at all levels of management. Meanwhile, digitization in companies is accelerating and simplifying the generation of this information. Thus, an attempt to reconcile these two areas - management accounting and digitalization - can lead to results that facilitate business operations in a chaotic environment.

The growing amount of information and the importance of interpreting it is creating a trend in the use of digital technologies to gain a clear understanding of business processes and markets and to make timely strategic management decisions (Chen, Chiang & Storey, 2012). By investing in digital technologies involving the accumulation of large amounts of new information, the pooling of existing internal and external information, companies are generating so-called “big data” whose analytics allow companies to gain a competitive advantage (Marshall, Mueck, & Shockley, 2015). This shows that management accounting changes due to the application of digital technologies, which also has an impact on the management accountant’s nature of the job, skills, and so on. In the context of these changes, management accounting professionals should play an important role, in moving from traditional, transactional accounting to big data and business intelligence. According to Appelbaum et al (2017) and Brands (2015) serving the purpose of assisting and participating in decision making with management, modern management accountants work from these aspects: to participate in strategic cost management for achieving long-term goals; to implement management and operational control for corporate performance measure; to plan for internal cost activity. Management accounting professionals must be able to apply fast-changing information to management, strategic decision-making, and strategy implementation (Brands, 2015). Rezaee & Wang (2017) point out that the responsibilities of accounting professionals should change from the role of contributors and auxiliary decision-makers to business decision-makers, who can create value for the company by providing data analytics and computational business development solutions. By using digital technologies tools to analyze big data internally, management accountants or business analysts can provide targeted forecasts based on extracted quality information (Appelbaum et al., 2017). With new business

management systems, big data, and analytics, management accountants can not only simply track and track key historical company figures, but also provide real-time insights or future forecasts that improve management decision-making.

Organizations, especially SMEs, must take into account the digital technologies they use and the management accounting functions they try to fulfill, to assess the impact of digitalization on the changes in management accounting, maximize the benefits of digital technologies, achieve a competitive advantage, and most importantly, to ensure successful performance through management accounting information for decision making.

The analysis of theoretical aspects of digitalization impact on the changes of management accounting results revealed that each organization accepts the digital challenges differently, therefore, the level of development of digitalization varies (initiated digitalization - reflects the lowest state of digitalization in which an organization defines themselves as initiators to become a digitally driven company in the future; uses IT as a tool to support their business; integrated digitalization - organizations aim to support the business strategy and activity with IT; organizations in these stages try to develop digital solutions; digitally-driven - reflects the IT use in each activity of the organization; all the activities of the organization become data-driven). What is more, this analysis also revealed that the application of management accounting also can be at different levels (narrow – only one (cost accounting) management function is implemented; intermediate – two (cost accounting and performance measurement) management accounting functions are implemented; wide – three (cost accounting, performance measurement, and planning & decision making) management accounting functions are implementing).



Fig 1. The logic of determining the impact of digitalization on the management accounting changes in SMEs

Source: Prepared by the authors

1 pav. Skaitmeninio poveikio valdymo apskaitos pokyčiams mažose ir vidutinėse įmonėse lygio nustatymo logika
Šaltinis: parengė autoriai

This means that the impact of digitalization on the changes in management accounting can be expressed at three stages: 1) insignificant integration: technologies and tools provide additional information, which will remain fully separate from management accounting in management and decision making; 2) information combination: technologies and tools provide information, which is additional to and separated from management accounting, but which is combined for example in the reporting phase for management and decision making; and 3) technology integration: technologies and tools are tightly integrated with management accounting, which provides integrated information for management decision making (Fig. 1). Thus the main result of this research prepared by using a systematic literature review is the determined theoretical assumptions for the impact of digitalization on the changes in management accounting, which are:

- as the level of development of digitalization varies and the application of management accounting also can be at a different level, the organization needs to determine the stage of the impact of digitalization on management accounting changes (such as insignificant integration, information combination, and technology integration).
- those SMEs that are digitally advanced are more likely to use more management accounting features to justify their business decisions.
- SME's investment in digital solutions may have an impact on the management accounting of that company.

Often management accounting in SMEs is very narrow or chaotic, and digital solutions are only useful when a company's management accounting is systematic. Therefore, in this case, these assumptions need to be verified empirically by testing them. Therefore, in future research more attention should be dedicated to the development of validated instruments to test the theoretical assumptions of the impact of digitalization on the changes in management accounting, which could be used to evaluate the current level of management accounting due to digitalization in SMEs. What is more, determining the level of integrity of digitization in management in accounting could be one of the directions for future research.

Conclusions

The findings of this research have contributed to the literature on digitalization and management accounting:

1. By revealing the management accounting and its value for the organization, it could be stated that management accounting is the primary support for decision-making in the organization in order to ensure the process of planning, control, performance measurement, transaction processing, reporting.

2. By disclosing the digitalization and its value for the organization, it could be stated that digitalization as a combination of different technologies is used to describe any changes in the organization, which could lead to the improvement of the performance of the organization.

3. Finally, it was prepared possible assumptions for the determination of the impact of digitalization on the changes in management accounting. The first assumption emphasized that it is important for the organization to determine the stage of the impact of digitalization on management accounting changes, as it is influenced by different levels of development of digitalization and application of management accounting. The second assumption let us assume that those SMEs that are digitally advanced are more likely to use more management accounting features to justify their business decisions. And the third assumption leads to the idea, that SMEs' investments in digital solutions may have an impact on the changes in management accounting applications.

Literature

1. Appelbaum, D., Kogan, A., Vasarhelyi, M., Yan, Z. 2017. Impact of business analytics and enterprise systems on managerial accounting. *International Journal of Accounting Information Systems*, Vol. 25, p. 29–44.
2. Bloching, B., Leutiger, P., Oltmanns, T., Rossbach, C., Schlick, T., Remane, G., Quick, P. and Shafranyuk, O. 2015. "Die digitale Transformation der Industrie. Was sie bedeutet. Wer gewinnt. Was jetzt zu tun ist", Roland Berger Strategy Consultants and BDI, Munich, Berlin, February.
3. Brands, K. 2015. Business Analytics: Transforming the Role of Management Accountants
4. Chen, H., Chiang, R. H. L. & Storey, V. C. 2012. Business Intelligence and Analytics: From Big Data to Big Impact. *MIS Quarterly*, Vol. 36, Iss. 4, p. 1165–1188.
5. Colombo, E., Mercurio, F., Mezzanzanica, M. 2019. AI meets labor market: Exploring the link between automation and skills. *Information Economics and Policy*, Vol. 47, p. 27–37.
6. De Carolis, A., Macchi, M., Negri, E., & Terzi, S. 2017. A maturity model for assessing the digital readiness of manufacturing companies. In *IFIP Advances in Information and Communication Technology*.
7. European Commission, 2015. Fostering SMEs' growth through digital transformation. European Commission, Retrieved from <http://s3platform.jrc.ec.europa.eu/-/fostering-smes-growth-through-digital-transformation> (viewed 13 December 2021).
8. Gartner, ? .2016. Gartner Survey Reveals Investment in Big Data is Up but Fewer Organizations Plan to Invest. Gartner Newsroom Press Release, Stamford, Conn October 4, 2016. <http://www.gartner.com/newsroom/id/3466117> (viewed 10 November 2021).
9. Gölzer, P., & Fritzsche, A. 2017. Data-driven operations management: Organisational implications of the digital transformation in industrial practice. *Production Planning & Control*, Vol. 28, Iss. 16, p. 1332–1343.
10. Gu, J.W. & Jung, H.W. 2013. The effects of IS resources, capabilities, and qualities on organizational performance: an integrated approach. *Information & Management*, Vol. 50, Iss. 2, p. 87–97, <https://doi.org/10.1016/j.im.2013.02.001>
11. Imran, F., & Kantola, J. 2019. Review of industry 4.0 in the light of sociotechnical system theory and competence-based view: A future research agenda for the evolve approach. In *Advances in Intelligent Systems and Computing*. https://doi.org/10.1007/978-3-319-94709-9_12
12. International Federation of Accountants. 1998. International management accounting practice statement. New York: Management Accounting Concepts.
13. Ittner, C. D., Larcker, D. F. 2001. Assessing empirical research in managerial accounting: a value-based management perspective. *Journal Accounting and Economics*, Vol. 32, Iss. 1, p. 349–410.
14. Kaya, C. T., Turkyilmaz, M., Birol B. 2019. Impact of RPA technologies on accounting systems. *Journal of accounting & finance*, Vol. 82, p. 235–250
15. Kerravala, Z. 2017. Digital transformation services are critical to business success. ZK Research. Retrieved from https://www.cisco.com/c/dam/en_us/services/downloads/digital-transformation-services-wp.pdf (viewed 13 June 2021).
16. Kocsis, D. 2019. The conceptual foundation of design and implementation research in accounting information systems. *International Journal of Accounting Information Systems* (in press).
17. Lavia Lopez, O., & Hiebl, M. R. W. 2015. Management accounting in small and medium-sized enterprises e current knowledge and avenues for further research. *Journal of Management Accounting Research*, Vol. 27, Iss. 1, p. 81–119.
18. Lederer, M., Knapp, J. & Schott, P. 2017. The digital future has many names—How business process management drives digital transformation. In 2017 6th International Conference on Industrial Technology and Management (ICITM) (pp. 22-26), IEEE, Cambridge, UK, March 7–10, [10.1109/ICITM.2017.7917889](https://doi.org/10.1109/ICITM.2017.7917889)
19. Loebbecke, C. and Picot, A. 2015. Reflections on societal and business model transformation arising from digitization and big data analytics: a research agenda. *Journal of Strategic Information Systems*, Vol. 24, Iss. 3, p. 149–157.

20. Maas, K., Schaltegger, S., Crutzen, N. 2016. Integrating corporate sustainability assessment, management accounting, control, and reporting. *Journal of Cleaner Production*, Vol. 136, p. 237–248
21. Marchand, D. A., Kettinger, W. J. & Rollins, J. D. 2002. Information Orientation: The Link to Business Performance. New York, NY, Oxford University Press Inc.
22. Marshall, A., Mueck, S. and Shockley, R. 2015. How leading organizations use big data and analytics to innovate. *Strategy & Leadership*, Vol. 43, Iss. 5, p. 32–39. <https://doi.org/10.1108/SL-06-2015-0054>
23. Matzler, K., Bailom, F., von den Eichen, S. F. & Anschober, M. 2016, Digital Disruption. Wie Sie Ihr Unternehmen auf das digitale Zeitalter vorbereiten, Vahlen, München.
24. Messner, M. 2016. Does industry matter? How industry context shapes management accounting practice. *Management Accounting Research* (June), 103–111.
25. Mitchell, F., & Reid, G. C. 2000. Problems, challenges, and opportunities: The small business as a setting for management accounting research. editorial. *Management Accounting Research*, Vol. 11, Iss. 4, p. 385–390.
26. Nandan, R. 2010. Management accounting needs of SMEs and the role of professional accountants: A renewed Research agenda. *Journal of Applied Management Accounting Research*, Vol. 8, Iss. 1, p. 65–78.
27. Rezaee, Z. and Wang, J. 2019. Relevance of big data to forensic accounting practice and education. *Managerial Auditing Journal*, Vol. 34, Iss. 3, p. 268–288. <https://doi.org/10.1108/MAJ-08-2017-1633>
28. Rikhardsson, P., Yigitbasioglu, O. 2018. Business intelligence & analytics in management accounting research: Status and future focus. *International Journal of Accounting Information Systems*, Vol. 29, p. 37–58.
29. Seasongood, S. 2016. Not just for the assembly line: A Case for Robotics in Accounting and Finance. *Financial Executive*, Vol. 32, p. 31–36.
30. Setia, P., Venkatesh, V. & Joglekar, S. 2013. Leveraging digital technologies: how information quality leads to localized capabilities and customer service performance. *MIS Quarterly*, Vol. 37, Iss. 2, p. 565–590.
31. Westerman, G., Calm ejane, C., Bonnet, D., Ferraris, P. and McAfee, A. 2011. Digital transformation: a roadmap for billion-dollar organizations. MIT Center for Digital Business and Capgemini Consulting, Cambridge, MA, and Paris.
32. World Economic Forum 2016. Digital Transformation of Industries: In collaboration with Accenture.

SKAITMENIZACIJOS ĮTAKA VALDYMO APSKAITOS POKYČIAMS MAŽŲ IR VIDUTINIŲ ĮMONIŲ ATVEJU

Santrauka

Tradicinė valdymo apskaita nebeatitinka besikeičiančios verslo aplinkos, vadovų poreikio greitai reaguoti ir kuo greičiau priimti sprendimus, kai vis daugiau technologinių sprendimų yra naudojama verslo aplinkoje. Valdymo apskaita dažniausiai taikoma siekiant priimti efektyvius ir kryptingus sprendimus skirtinguose valdymo lygiuose. Tuo tarpu įmonėse vykstantis skaitmeninimas šios informacijos generavimą spartina ir supaprastina. Taigi, bandymas derinti šias dvi sritis – valdymo apskaitą ir skaitmenizaciją – gali duoti teigiamų rezultatų, palengvinančių verslo veiklą chaotiškoje aplinkoje. Siekiant atskleisti skaitmenizacijos poveikį valdymo apskaitos pokyčiams mažų ir vidutinių įmonių atveju, buvo naudojamas sisteminis literatūros apžvalgos metodas. Rezultatai atskleidė galimas skaitmenizacijos poveikio valdymo apskaitos pokyčiams mažų ir vidutinių įmonių atveju nustatymo prielaidas.

Reikšminiai žodžiai: valdymo apskaita, skaitmenizacija, mažos ir vidutinės įmonės.