

The Impact of Digital Technologies on the Transformation of Controller Roles

Abstract: *Digital technologies are significantly changing the way business information is collected, processed and interpreted, thereby also affecting the development of the controlling profession. Using a narrative literature review, the paper examines how digitalization, business intelligence, data analytics, automation and artificial intelligence are changing the traditional activities of controllers, their competencies and their role in the business decision-making process. The paper proceeds from the view that digital technologies do not diminish the importance of controlling, but rather contribute to its transformation from a predominantly reporting and supervisory function towards an analytical, advisory and business-partnering role. Particular emphasis is placed on the potential of digital technologies to improve information quality, reporting speed, planning, forecasting and management support. At the same time, the challenges of digital transformation are considered, such as the need to develop digital competencies, data quality, organizational readiness and the preservation of controllers' ability to exercise professional judgement. The paper concludes that the contribution of digital technologies depends on controllers' ability to connect technological solutions with financial expertise, an understanding of the business model and communication with management.*

Keywords: *controlling, digital technologies, business decision-making, business partnering*

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INTRODUCTION

The contemporary business environment is characterized by accelerated technological changes, a large amount of available data and an increasingly pronounced need of management for timely and reliable information. In such circumstances, digital technologies are becoming an important factor in changing the way information is collected, processed, analyzed and used in the business decision-making process. Their significance is reflected not only in the technical improvement of information systems, but also in changes in the way business functions that rely on data and information operate. One of the most important competitive advantages for all business functions will be precisely the extent to which they use contemporary digital technologies to improve their efficiency. Given the nature of the operations and activities of the controlling business function, whose basic tasks are to analyze business performance and present it adequately to the organization's management, it is necessary to examine how new digital technologies affect the work of controllers. In order to successfully support managers in the business decision-making process, controllers' practice in earlier periods was focused on the analysis of historical, aggregated and accounting data (Szukits, 2022). Traditionally, controlling was focused on the preparation of reports, variance analysis, budgeting, cost monitoring and the provision of information based predominantly on historical accounting data. All the above-mentioned tasks of controllers remain very important; however, by themselves they are no longer sufficient to respond adequately to the needs of contemporary management. Business decisions are increasingly made under conditions of rapid change, uncertainty and a large amount of available information, which is why a higher level of analytical and advisory support is expected from controlling.

At a time of rapid growth in the volume of data, it is considered insufficient to rely exclusively on historical data for decision-making; instead, it is necessary to use forward-looking business analytics in order to identify and understand market trends and consumer behavior, develop new products and improve strategic decisions (Bhimani & Willcocks, 2014). Strategic decisions have a significant and long-term impact on organizational success, such as investments, acquisitions and divestments of business units. The most important characteristics of these decisions are uncertainty, and they require the connection and interpretation of information within the interaction between controllers and managers (Fourné et al., 2023). The importance of strategic decisions on which controllers may have an influence further highlights the importance of their professional role in organizations, since by providing information support to management they indirectly affect the overall future position of the organization. Digital technologies enable large volumes of data to be processed faster, in greater detail and with a lower degree of manual work. Business intelligence, data analytics, automation, machine learning and artificial intelligence make it possible for business information to be used not only to explain past events, but also to identify trends, assess future developments and consider the possible consequences of business decisions. In this way, controlling is increasingly shifting from

retrospective reporting towards more active participation in the management process. However, greater data availability does not automatically imply better decision-making. Data acquire value only when they are accurate, relevant, understandable and connected with the specific business context. This is precisely where the importance of the contemporary controller is reflected. The controller's role is not only to provide data, but also to interpret them, identify what is relevant, point out possible risks and help management use information in an appropriate manner.

The aim of this paper is to examine how digital technologies affect the transformation of the controlling profession. Particular attention is directed towards changes in controllers' traditional activities, the development of new competencies and the strengthening of controllers' business-partnering role in the business decision-making process.

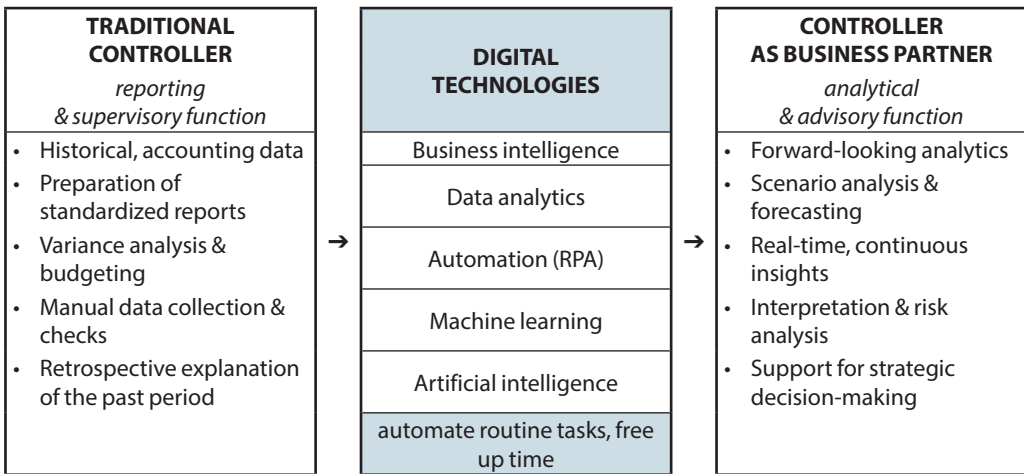
LITERATURE REVIEW

Digitalization has emerged as one of the primary strategic priorities in organizations, and technologies associated with digitalization have significant implications for how management accounting and control practices are carried out within the finance function (Bedford et al., 2025). The impact of digital technologies on controlling can first be observed through changes in the everyday activities performed by controllers. Tasks that previously required considerable time, manual work and multiple data checks are increasingly being automated. This applies to data collection, data processing, reconciliation, the preparation of standardized reports, variance analysis and the distribution of information to users. The analysis of large volumes of data enables decision-makers to make decisions more quickly, which may result in lower costs, faster product development and the proactive identification of market trends. Expectations are that the analysis of large volumes of data will lead to more fact-based and real-time decision-making, which consequently affects the quality of decision-making (Franke & Hiebl, 2023). The role and importance of controllers as moderators of accounting information is particularly emphasized in the era of digitalization, large volumes of data and the intensive use of business intelligence tools. The task of controllers is to identify, from the data provided by business intelligence systems, those data that are irrelevant, thereby directly acting as sense-makers of these data (Järvenpää et al., 2023).

An increased intensity of the use of digital technologies does not mean that traditional controlling activities disappear, but rather that the way in which they are performed changes. Reporting, budgeting, variance analysis and cost control remain important elements of controlling, but controllers are expected to spend less time on the technical preparation of data and more time on their interpretation and connection with business decisions. The value of controllers is therefore increasingly less based on the preparation of reports itself, and increasingly more on the ability to explain what information means for business operations. One of the most important changes relates to the speed of reporting. In the traditional working model, management often received information after the

end of the accounting period, when certain business consequences had already occurred. Digital systems enable information to be prepared more quickly, key indicators to be monitored more frequently and deviations to be identified earlier. In this way, controlling can contribute to more timely responses and better steering of business activities. The use of digital tools such as RPA and machine learning is becoming standard in data processing. More than ever before, controllers are expected to combine accounting knowledge with knowledge of automated systems and processes, as well as to understand complex process rules that enable robotic systems to function (Roozen et al., 2019).

Figure 1 Transformation of the controller's role
under the influence of digital technologies



Source: Authors' own work

In addition to speed, the breadth of the information base is also changing, with sales, market, logistics, production and other non-financial data becoming increasingly important. By connecting financial and non-financial data, a more comprehensive picture of business operations is obtained, because financial performance can be observed together with the causes that led to it. In this way, the controller can better explain not only what happened, but also which factors shaped current performance and what the expectations are for the future period. Digital technologies contribute particularly to the improvement of planning and forecasting. Instead of relying exclusively on results from previous periods, organizations can use a broader set of data to prepare projections, conduct scenario analysis and assess possible risks. Such an approach enables controlling to be more future-oriented and less limited to the subsequent explanation of past events. This increases its importance in strategic and operational decision-making.

In addition to business intelligence systems, machine learning and automated processes, tools based on artificial intelligence are gaining increasing importance in the everyday

activities of controllers. Artificial intelligence changes business operations in a way that simplifies and accelerates processes, leading to greater organizational efficiency and increased precision and agility required for decision-making and the generation of financial consequences (Aljohani, 2023). The use of artificial intelligence affects the optimization of manual tasks such as data entry and data analysis, which consequently increases efficiency. Tools based on artificial intelligence not only analyze data at high speed, but also succeed in detecting hidden patterns (Jeremić & Luka, 2024). The impact of digitalization on the key core processes of controlling clearly indicates the expansion and shift of controlling activities. IT systems will increasingly take over and perform traditional controlling tasks that primarily relate to data collection, processing and distribution. The intensive use of digital technologies will not lead to the replacement of controllers in companies that use these technologies, but rather to the expansion of their role and changes in their tasks (Hastenteufel et al., 2024).

In addition to the highlighted advantages of using tools based on digital technologies, it is also necessary to consider their disadvantages, such as increased complexity in accounting techniques including budgeting, pricing and performance measurement, data reliability and the quality of data sources, poor decision-making, job reductions and data ownership (Abbas, 2026). Therefore, based on the presented insights from the relevant professional literature, it can be observed that it is not sufficient merely to deliver, at high speed, the results generated by digital tools; rather, professional assessment of their validity is required. It is necessary to understand on the basis of which data the results were obtained, what the limitations of the models used are and whether the conclusions are meaningful in the specific business context. Research conducted by van Slooten et al. (2026) indicates that digitalization leads to increased role conflict and role ambiguity among controllers because it introduces new patterns into controllers' professional activities in the digital age. It is further established that increased role conflict and role ambiguity are more pronounced among controllers oriented towards traditional roles than among controllers who perform the role of business partner.

METHODOLOGY

This paper applies a narrative literature review to synthesize existing knowledge on the impact of digital technologies on controlling activities and controller roles. The review encompasses academic and professional publications addressing digitalization, business intelligence, data analytics, automation, machine learning and artificial intelligence in management accounting and controlling. The final body of literature comprises 17 publications published between 2011 and 2026. The sources were selected according to their relevance to three analytical themes: changes in traditional controlling activities, the development of controllers' digital and analytical competencies, and the strengthening of the controller's business-partnering role. The selected publications were analyzed comparatively and thematically, and their findings were integrated into a conceptual synthesis

showing how digital technologies automate routine activities, broaden the available information base and shift controllers' work towards interpretation, advisory support and participation in strategic decision-making. As a narrative review, the paper seeks to identify and discuss the dominant patterns in the literature rather than to provide a statistical meta-analysis or a fully systematic review.

RESULTS AND DISCUSSION

The reviewed literature indicates that digital technologies transform controller roles through three interconnected mechanisms: the automation of routine activities, the expansion of controllers' analytical and digital competencies, and their stronger participation in managerial decision-making. These changes provide the basis for the transition from a predominantly reporting and supervisory role towards a more pronounced analytical, advisory and business-partnering role.

According to Fourné et al. (2018), the role of controllers as business partners is characterized by a range of activities directed towards strategic decision-making, among which the following stand out:

- preparing scenario analyses as support for strategic planning;
- communicating with management about future business prospects;
- conducting sensitivity analyses of key performance drivers;
- proactively interpreting the impact of non-financial indicators on profitability;
- participating in discussions on strategic issues with senior management;
- and engaging in management boards in order to present the financial implications of strategic options.

It can be concluded that the role of controllers as business partners to management does not imply the preparation of reports and the retrospective analysis of accounting data, but rather active participation in the business decision-making process. Digital technologies have been one of the crucial factors that freed up controllers' time and enabled them to achieve a greater focus on the analysis of strategic options and the provision of concrete proposals for management's business decision-making. Changes in controlling activities affect changes in the competencies expected of controllers. In addition to specialized knowledge in the fields of finance and accounting, a comprehensive set of business-analytical and IT skills is expected to become a major part of controllers' skill profile in the near future (Oesterreich & Teuteberg, 2019). Knowledge in the areas of accounting, finance, budgeting and reporting continues to represent the foundation of the profession, but is no longer sufficient on its own. The contemporary controller must combine traditional financial expertise with digital, analytical, communication and business competencies. Digital competencies are becoming increasingly important because a large part of controllers' work takes place through information systems, databases,

business intelligence tools and automated processes. Analytical competencies are particularly evident in work with large volumes of data. In contemporary business, the problem is often not a lack of information, but rather an excessive amount of it. For this reason, the controller must be able to identify relevant data, recognize key indicators, detect interrelationships and present management with information that is truly important for decision-making. In this way, the controller's role shifts from the mere provision of data towards their meaningful structuring.

In addition to analytical skills, communication abilities are becoming increasingly important. The information prepared by the controller must be understandable to managers who often do not have the same financial or technical knowledge. The task of the controller is to present complex data clearly, explain the business consequences of certain indicators and point to possible courses of action. Compared with the mere provision of information, controllers are expected to know the individual characteristics of the managers they support and must be familiar with managers' level of ability to interpret data (Weber, 2011). In this sense, the quality of controlling does not depend only on the accuracy of data, but also on the controller's ability to transform those data into a useful message for management. Fourné et al. (2023) specifically emphasize that cognitive flexibility in interpersonal collaboration is a key mechanism through which controller roles can influence strategic decision-making, with particular emphasis on the positive relationship between the business partner role and the quality of strategic decisions, mediated by cognitive flexibility.

Despite the broad availability of large amounts of data, the data themselves cannot by themselves guarantee that the information contained in them is relevant to a company's specific business model and its performance drivers. Turning data into knowledge is a task that does not require algorithmic computing capacity, but primarily human business acumen (Mahlendorf & Weißenberger, 2021). For this reason, the contemporary controller is positioned as an intermediary between technology and management. The controller is no longer merely a person who prepares reports after business events have taken place, but a participant in the decision-making process. The controller should help management understand the financial consequences of different alternatives, assess risks and connect operational information with the organization's strategic goals. Such a role requires a broader understanding of the business model, the market environment and the factors that affect organizational performance. On the one hand, the controller must understand the capabilities of digital tools and the data they generate. On the other hand, the controller must understand management's needs and the business context in which decisions are made. It is precisely the ability to connect these two sides that represents the basis of the new value of controlling in the digital environment. Controllers can primarily improve their digital competencies by deepening their knowledge of each new digital technology relevant to their professional role; in this way, they can control important conditions for preserving the relevance of their own professional role (Steens et al., 2024).

CONCLUSION

Digital technologies are significantly changing the controlling profession, but not in a way that makes it less important. On the contrary, they create the conditions for controlling to develop from a predominantly reporting and supervisory function into a function with a more pronounced analytical, advisory and business-partnering role. Automation, business intelligence, data analytics, machine learning and artificial intelligence enable faster information processing, more detailed analysis and better support for management in the decision-making process. The greatest change is reflected in the shift of focus from the technical preparation of data to their interpretation. Routine activities are increasingly being automated, while controllers are expected to explain the causes of business developments, assess the consequences of decisions, identify risks and provide management with useful insights. In this way, the controller becomes an important participant in transforming data into knowledge that can have practical value for the organization.

At the same time, digitalization also brings new challenges. Data quality, reliability of sources, integration of information systems, development of digital competencies and a clearly defined controller role are becoming important prerequisites for successful transformation. The introduction of new technologies is not sufficient in itself if it is not accompanied by the development of knowledge, changes in processes and stronger cooperation between controllers and management. Controllers who possess and successfully integrate financial expertise, data analytics, an understanding of the business model and communication with management will have an increasingly important role in contemporary organizations. Digital technologies should therefore be viewed not as a threat to the controlling profession, but as an opportunity for its further development and for increasing its contribution to business decision-making.

Future research should examine the current role of controllers in companies. It should also explore how controllers use available digital technologies in their work. Particular attention should be paid to whether these technologies can truly be considered the main driver of the transformation of the controller's professional role. This role is increasingly oriented towards partnership with management, compared with traditional activities that were primarily focused on reporting on achieved financial performance.

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Uticaj digitalnih tehnologija na transformaciju uloga kontrolora

Apstrakt: Digitalne tehnologije značajno menjaju način prikupljanja, obrade i tumačenja poslovnih informacija, čime utiču i na razvoj kontroling profesije. Cilj rada je da se ispita kako digitalizacija, poslovna inteligencija, analitika podataka, automatizacija i veštačka inteligencija menjaju tradicionalne aktivnosti kontrolora, njihove nadležnosti i njihovu ulogu u procesu donošenja poslovnih odluka. U radu se polazi od stava da digitalne tehnologije ne umanjuju značaj kontrolinga, već doprinose njegovoj transformaciji iz pretežno izveštavanja i nadzorne funkcije u savetodavnu i poslovno-partnersku ulogu. Poseban naglasak je stavljen na potencijal digitalnih tehnologija za poboljšanje kvaliteta informacija, brzine izveštavanja, planiranja, predviđanja i podrške menadžmentu. Istovremeno, razmatraju se izazovi digitalne transformacije, kao što su potreba za razvojem digitalnih kompetencija, kvalitet podataka, organizaciona spremnost i očuvanje sposobnosti kontrolora da vrše profesionalnu prosudbu. U radu se zaključuje da doprinos digitalnih tehnologija zavisi od sposobnosti kontrolora da povežu tehnološka rešenja sa finansijskom ekspertizom, razumevanjem poslovnog modela i komunikacijom sa menadžmentom.

Ključne reči: kontroling, digitalne tehnologije, poslovno odlučivanje, poslovno partnerstvo