The Role of Information Technology Tools in Project Planning and Monitoring

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DOI: 10.24427/az-2026-0007

Abstract

Effective project planning and monitoring are key factors determining the successful achievement of project objectives in modern organizations. Along with the development of information technologies, the importance of information technology tools supporting project managers in scheduling activities, allocating resources, controlling costs and reporting project progress has significantly increased. The aim of this article is to analyze the role of information technology tools in project planning and monitoring processes and to identify the areas in which information technologies contribute most strongly to improving project management effectiveness. The study is based on a review of the relevant literature and a descriptive-analytical approach, enabling a structured presentation of the functions and applications of selected information technology tools used in project management. Particular attention is given to digital tools supporting key project management processes, particularly in the areas of planning, resource coordination, cost control, risk management and performance monitoring. The article also addresses the challenges and limitations associated with the use of information technology tools in project practice, emphasising the importance of user competencies for their effective implementation. The conclusions presented may provide a basis for further research as well as practical implications for project management practice.

Key words

project management, information technology tools, project planning, project monitoring, scheduling and control, project performance

Introduction

Projects have become one of the dominant forms of organizing work in contemporary organizations, enabling the implementation of complex and time-bound initiatives across various sectors of the economy. The growing importance of projects results from increasing market competition, rapid technological change and the need for flexibility in responding to dynamic environmental conditions. In this context, effective project management is increasingly recognised as a critical factor contributing to organizational performance and long-term competitiveness. Among the key processes of project management, project planning and monitoring play a central role, as they directly influence the achievement of project objectives in terms of time, cost, scope, and quality.

Project planning involves defining project goals, developing schedules, allocating resources, estimating costs and identifying potential risks. Monitoring, in turn, enables continuous tracking of project progress, comparison of actual results with planned values and the identification of deviations that may require corrective actions. These processes are closely interrelated and form the foundation for informed decision-making throughout the project life cycle. Ineffective planning or insufficient monitoring often leads to delays, cost overruns and reduced project performance, highlighting the need for appropriate tools and methods supporting these activities.

The development of information technologies has significantly transformed the way projects are planned and monitored. Information technology tools provide project managers with advanced functionalities for scheduling activities, managing resources, controlling budgets and reporting project progress. Spreadsheet software, project management applications, communication platforms and data visualization tools enable more accurate planning, faster access to information and improved transparency of project processes. As a result, information technology tools have become an integral component of project management practice, supporting both operational and strategic project-related decisions.

Recent studies addressing current and future labour market competency requirements indicate that expectations toward both candidates and early-career employees increasingly include, among others, digitalisation and automation skills, proficiency in advanced software and competencies related to project and process management (Ejdys et al., 2024, p. 151). These findings suggest that project managers must possess not only methodological knowledge but also strong technological competencies that enable them to effectively utilise digital tools in planning, coordination and monitoring activities. The need to develop such competencies is also reflected in

higher education, which is increasingly expected to prepare individuals for functioning in conditions of constant change and to support the development of adaptive and decision-making capabilities (Gudanowska et al., 2025).

At the same time, the growing availability of information technology tools presents new challenges for project managers. The diversity of available solutions, differences in their functionalities and the need for integration between various systems may complicate their effective use. Moreover, the benefits resulting from the application of information technology tools largely depend on the competencies of users and their ability to select appropriate tools for specific project management tasks. Therefore, understanding the role of information technology tools in project planning and monitoring requires not only an analysis of technological solutions but also an examination of their practical application within project management processes.

In response to these challenges, there is a need for a structured analysis of how information technology tools support project planning and monitoring activities. This article aims to examine the role of selected information technology tools in these processes and to identify the areas in which they contribute most significantly to improving project management effectiveness. The study is based on a review of the relevant literature and a descriptive-analytical approach, focusing on the functions of information technology tools used for scheduling, monitoring task execution, analyzing time and cost variances and supporting project communication. Additionally, the article shortly discusses the limitations and challenges associated with the use of information technology tools in project practice.

1. Definition of project and project management

In recent decades, there has been a marked increase in the use of the project approach, which has become firmly established in management practice. Projects are now found in almost every field – from business, through science and administration, to the social sector – forming the basis for the implementation of development activities. Due to the wide range of applications of projects, many definitions describing their nature and specificity have been developed in the literature on the subject. It is therefore worth referring to the most frequently cited definitions in order to grasp the essence of this concept.

In the literature on the subject, there are many different definitions of the concept of a project. The definition created by the Project Management Institute (PMI), formulated in the second half of the 20th century (1998), is considered to be the foundation of the modern understanding of a project, defining it as a finite undertaking focused on creating a unique product, service, or outcome, consisting of a series of

planned tasks and deliverables executed in a systematic manner to achieve the intended objectives [Project Management Institute, https://www.pmi.org/about/what-is-a-project, 20.11.2025]. An interesting approach to analysis the definition of a project was presented by Trocki (Trocki, 2012, p. 19), referring to research conducted by B. J. Madaus (Madauss, 2000, pp. 516-529), which aimed to analyse 16 definitions of project management (which came from the most competent specialists and organisations) and identify the most important characteristics of a project. The most important features of the projects listed by Trocki are presented in the table 1.

Tab. 1. The most important features of the projects

No.	Feature
The most important	
1.	time constraints
2.	clearly defined beginning and end of the project
3.	clear identification of the purpose, tasks, and responsibilities
4.	one-off nature
5.	uniqueness
6.	financial and resource constraints
7.	complexity
Less important	
8.	interdisciplinary nature
9.	novelty
10.	specific project organization
11.	involvement of multiple people, teams, and organizations
12.	size
13.	uncertainty and risk
14.	dynamics and boundaries from other projects

Source: own elaboration based on [Trocki, 2012, p. 19].

According to Kerzner et al. (Kerzner et al., 2005, p. 17), a project is „an undertaking for which objectives, required resources, deadlines, costs, and quality levels are specified". An interesting and influential perspective on the nature of projects was introduced by John Dewey. As presented in the *Project Management: T-Kit 3* developed by the Council of Europe and the European Commission (2000), J. Dewey (1859-1952), known for the *learning by doing* approach, emphasised that a project

should involve collective reflection, consideration of contextual conditions, reference to past experiences and the ability to synthesise historical knowledge with present circumstances to derive meaning and direction for action.

Having discussed the concept of a project, it is now necessary to address how such endeavours are organised and implemented in practice. This naturally leads to the notion of project management, which provides a structured approach to planning, coordinating and controlling project activities. Against this background, it is important to refer to the definitions of project management formulated in the literature. Project management refers to the systematic application of knowledge, skills, tools and techniques to project activities in order to meet defined requirements and objectives. The subject literature does not provide one unified definition of project management, but rather presents multiple, non-contradictory interpretations that attempt to organise and explain this notion. As Trocki notes, „project management can be considered both as a field of theoretical and practical knowledge (which is applied in project management) and as a set of managerial skills necessary for the effective and efficient implementation of a project" (Trocki, 2012, p. 49). In turn, Wyrozębski believes that „due to its dynamics, particular practical dimension and broad spectrum of issues, this field is characterised by rich knowledge resources and a continuing deficit of scientific systematics of solutions and management methods" (Wyrozębski, 2014, p. 132). Particularly noteworthy is the definition proposed by the Project Management Institute (PMI), which describes project management as the application of specialised knowledge, skills, tools and methodologies to project activities in order to fulfil established objectives [Project Management Institute, https://www.pmi.org/about/what-is-project-management, 20.11.2025]. In this view, project management involves the structured planning, coordination and execution of tasks that transform an initial concept into a concrete product, service or outcome. It also encompasses key activities such as defining scope, identifying deliverables, assessing risks and ensuring effective communication among project stakeholders. According to Fewings, project management involves the systematic planning, supervision and regulation of project activities, accompanied by the effective engagement of all participants, so that the project goals are met within the assumed timeframe, budget, quality requirements and performance standards (Fewings, 2005, pp. 11-12). In summary, the diversity of definitions indicates that project management is interpreted through various perspectives, yet they all emphasise purposeful action aimed at achieving project objectives.

The conceptual understanding of project management forms only the starting point; equally important is the identification of its essential components, which serve

as the basis for effective project execution. Several key elements can be distinguished that structure the management process and determine the effectiveness of project delivery. In addition to traditional process-oriented frameworks, contemporary standards increasingly emphasise guiding principles that underpin successful project realisation. The Project Management Institute (PMI) defines a set of twelve project management principles that serve as fundamental tenets for planning, executing and leading projects in diverse environments and methodologies. These principles encompass aspects such as stewardship of resources, holistic systems thinking, focus on value, quality, adaptability and effective stakeholder engagement, providing a behavioural and strategic foundation for project management practice. 12 principles of project management are presented in figure 1.

Fig. 1. Principles of project management proposed by Project Management Institute (PMI)

Source: Project Management Institute, 12 Principles of Project Management, https://www.pmi.org/-/media/pmi/documents/public/pdf/pmbok-standards/12-project-management-principles.pdf, 20.11.2025.

Presented principles reflect the gradual transformation of project management from a discipline centred mainly on procedures and control mechanisms toward one that emphasises value creation, human dynamics and adaptability. Rather than prescribing specific techniques, they promote a mindset that encourages reflective decision-making, proactive stakeholder engagement and the ability to navigate complexity and change. This shift suggests that project success is increasingly determined not only by adherence to schedules and budgets, but also by the capacity of project teams to collaborate, learn and respond to emerging challenges in a flexible

and value-driven manner. Building upon these principles it is also important to examine the knowledge areas that define the technical and managerial domains of project work, providing a more structured perspective on the processes involved in project planning and execution.

2. Stages of the project lifecycle

The project lifecycle represents an organised framework that divides a project into successive stages, providing structure for planning, decision-making and evaluation. Despite differences across standards and methodologies, core phases such as initiation, planning, execution, monitoring, control and closure remain widely recognised in the literature (Bajare et al., 2025, p. 649) (fig. 2). The significance of these stages lies in their ability to support control of scope, time, cost and quality, with planning and monitoring forming the foundation of efficient project management.

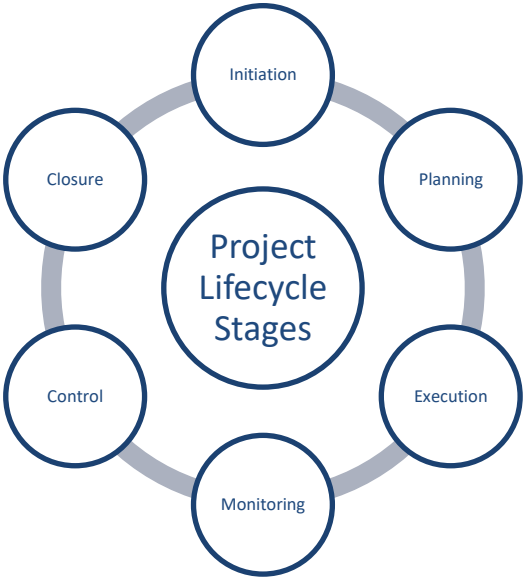

Fig. 2. Project lifecycle stages

Source: own elaboration based on [Bajare et al., 2025, p. 649].

The initiation phase is a crucial part of the project lifecycle and defines the moment when the project formally begins. At this stage, the essential activities include clarifying the core objectives, assigning responsibility for project oversight and

providing suitable resources (Kapusta, 2022, p. 16). The outcome is typically a project charter that authorises further work and sets the initial scope and boundaries of the project.

The planning phase focuses on translating the project concept into a structured plan of action. It includes defining the project scope, formulating objectives, estimating resources and costs, developing schedules and preparing risk management strategies. It is worth mentioning here that detailed planning often reveals gaps or incorrect assumptions made earlier during the initiation stage or while preparing the project proposal [PM4DEV, 2020, 20.11.2025].

The execution phase is centred on implementing the plans developed earlier and delivering project outputs. Tasks are assigned and performed, resources are mobilised and teams collaborate to produce deliverables. This stage involves carrying out the necessary actions and coordinating efforts to ensure that planned activities are completed effectively.

The monitoring and control stage runs parallel to execution and involves tracking project performance against established plans. It is a continuous process of measuring progress, analysing deviations and implementing corrective or preventive actions to ensure that project activities remain aligned with defined objectives and performance standards (Jeremiah Barasa Kabeyi, 2019, p. 70).

The closure phase signifies the formal completion of the project. It involves final deliverable acceptance, release of resources, evaluation of project outcomes and documentation of lessons learned. Administrative activities such as reporting, archiving and contract closure are also performed. This phase provides an opportunity to assess project success and transfer knowledge for future initiatives.

Among these phases, planning and monitoring play a crucial role, as they determine the direction of the project and ensure that progress remains aligned with expectations. Their quality directly influences the control level during execution and the overall project outcome. Although presented sequentially, project stages often interact dynamically and may partially overlap, especially in complex or evolving environments(Kapusta, 2022, p. 19). This iterative nature highlights the importance of continuous communication and decision-making throughout the lifecycle.

Together, these phases illustrate the dynamic and iterative character of project work, emphasising the role of planning, monitoring and informed decision-making in achieving project goals. It is worth emphasizing that the ways in which they are operationalised can differ, depending on the management approach adopted.

3. Overview of selected project management methodologies

Building on the discussion of project definitions, management concepts and the stages of the project lifecycle, it becomes necessary to consider the methodological frameworks that guide project management practice. Project management methodologies provide structured sets of principles, processes and tools that support planning, execution and control across different project contexts.

One of the most widely recognised approaches to project management is the Project Management Body of Knowledge (PMBOK®), developed by the earlier mentioned Project Management Institute (PMI) [PMBOK® Guide, https://www.pmi.org/standards/pmbok, 17.12.2025]. PMBOK represents not a rigid methodology, but a comprehensive framework that consolidates best practices, guidelines and terminology commonly applied in managing projects across various industries and organisational contexts. PMI first published PMBOK® in 1983 and over the course of more than 40 years, the guide has seen eight editions, the latest of which was released in November 2025 [PMBOK® Guide, https://www.pmi.org/standards/pmbok, 17.12.2025]. The main objective of the creators was to collect best practices in project management and to develop a common vocabulary for those involved in project management (Kapusta, 2022, p. 25). Traditionally, the PMBOK framework has been structured around process groups and knowledge areas, offering a systematic and process-oriented view of project management. The process groups reflect the stages of project work, initiation, planning, execution, monitoring and control, and closure, while the knowledge areas define the key domains of managerial responsibility, such as scope, schedule, cost, quality, resources, communication, risk, procurement and stakeholder management. This structure enables project managers to organise activities, allocate resources and maintain control over project objectives throughout the project lifecycle.

Another widely recognised project management approach is PRINCE2® (Projects in Controlled Environments) originally developed for the UK public sector and currently maintained by Axelos [Axelos, PRINCE2®, https://www.axelos.com/, 12.12.2025]. When developing this methodology, the creators sought to establish a procedure that would facilitate the achievement of objectives to the highest possible degree in line with the predefined performance indicators [Rynkiewicz, 2015, p. 136]. This approach is built upon seven principles, seven themes and seven processes, which together create a structured framework supporting effective project governance and decision-making. A distinguishing feature of PRINCE2® is its strong emphasis on governance, particularly through clearly defined roles and responsibilities that support accountability and structured-decision making. One of the

core principles of PRINCE2 is continued business justification, meaning that the project must remain viable and aligned with organisational objectives throughout its lifecycle [Łabuda, 2010, p. 71]. Importantly, PRINCE2® is designed to be tailored, allowing organisations to adapt the method to the size, complexity and risk profile of a given project. While PMBOK® functions primarily as a flexible body of knowledge, PRINCE2® offers a more prescriptive and process-oriented approach, placing greater emphasis on control mechanisms, documentation and formal governance structures.

In contrast to traditional plan-driven approaches such as PMBOK® and PRINCE2®, Agile represents a more flexible and adaptive paradigm of project management, emphasising iterative development, customer collaboration and responsiveness to change. In traditional project management approaches, requirements are typically defined during the early stages of the project and are expected to remain relatively stable throughout its execution (Kisielnicki & Misiak, 2017, p. 29). In contrast, Agile embraces evolving requirements, allowing teams to adapt to changing stakeholder needs and environmental conditions. The Agile philosophy is grounded in a set of core values that prioritise individuals and interactions over processes and tools, working solutions over extensive documentation, customer collaboration over contract negotiation and responsiveness to change over strict adherence to plans [Hołub, 2009, p. 220]. These values reflect a fundamental shift from procedural control toward adaptability, collaboration and value delivery in project environments.

The reviewed methodologies illustrate the evolution of project management from structured plan-driven models toward more adaptive approaches capable of addressing the challenges of dynamic project environments. While traditional frameworks provide stability and control, agile approaches prioritise flexibility and responsiveness. The selection of an appropriate methodology increasingly depends on factors such as project complexity, organisational context and technological maturity.

4. IT tools supporting project planning and monitoring

Effective project planning is widely recognised as one of the primary determinants of project success, as it establishes the foundation for resource, allocation, scheduling, risk anticipation and coordination of project activities. In increasingly complex organisational environments, traditional planning practices are being progressively enhanced by information technology tools that enable more accurate forecasting, improved data integration and greater transparency of project processes. By

supporting analytical capabilities and facilitating real-time access to information, digital solutions allow project managers to make more informed decisions and respond more effectively to emerging challenges. Consequently, the integration of IT tools into the planning phase has become a critical factor in strengthening the overall effectiveness of project management. Giegiel and Szpilko [2025, p. 288] emphasise that information technology has evolved into a strategic factor for ensuring sustainable competitive advantage in modern enterprises, driven by globalisation, intense competition and the growing demand for high-quality decision-making.

The increasing scale and complexity of modern projects have significantly expanded the informational demands placed on project managers, making technological support no longer optional, but essential for effective planning. From a functional perspective, information technology tools support project planning across several interrelated managerial activities that collectively enhance the structure, coherence and feasibility of project plans. A closer examination reveals several functional areas in which technological support plays a particularly significant role in strengthening project planning processes. One such critical area in which information technology supports project planning is schedule development, as the creation of realistic timelines directly influences the feasibility and coordination of project activities. The project management literature emphasises that digital scheduling tools enhance the accuracy of planning processes by enabling managers to identify task dependencies, estimate durations and optimise activity sequences [Pondel and Pondel, 2011, p. 174]. Beyond their operational functionality, these tools strengthen the analytical dimension of project planning by improving forecasting effectiveness and supporting more proactive managerial decision-making. As a result, technological support in scheduling contributes not only to greater temporal control, but also to increased predictability of overall project outcomes.

Currently, a wide range of information technology tools is available to support effective project planning. These kind of solutions are not limited to traditional desktop applications; increasingly, web-based platforms and cloud-enabled systems are being adopted by project managers to enhance accessibility, flexibility and collaborative planning processes. Moreover, the growing integration of artificial intelligence into project management tools reflects a shift toward more data-driven planning, supporting managerial decision-making, enabling earlier risk identification and providing real-time insights that strengthen project adaptability. [Łukasik-Stachowiak, 2025, p. 296].

Given the wide range of tools currently available, the selection of an appropriate solutions plays a significant role in shaping the effectiveness of project planning. To support the selection of appropriate technological solutions, various rankings and

comparative reports are developed to evaluate tools and software widely recognised among users. One of the most popular and noteworthy studies is the regularly published report by Gartner Inc., called *Gartner Magic Quadrant for IT Project and Portfolio Management* (fig. 3).

Fig. 3. Magic Quadrant for Project and Portfolio Management

Source: own elaboration based on Gartner Inc., USA, May, 2019, www.gartner.com.

As illustrated in Fig. 3, the *Gartner Magic Quadrant* categorises technology providers into four groups: Leaders, Challengers, Visionaries and Niche Players, based on their ability to execute and completeness of vision. This classification suggests that effective project management solutions should combine operational reliability with strategic development, reflecting the evolving expectations placed on contemporary digital tools. In addition to the *Gartner Magic Quadrant*, reports such as the Forrester Wave™ [Forrester, https://www.forrester.com/policies/forrester-wave-

methodology/, 05.02.2026] offer a structured evaluation of technology providers, enabling a multidimensional comparison of solutions available on the project management software market.

While market reports provide valuable insight into the positioning of technology providers, it is equally important to examine the specific planning functions supported by these tools and their implications for project effectiveness. One particularly critical domain is resource planning, as the effective allocation of human and material resources directly influences project continuity and performance. From a managerial perspective, resources are often conceptualised through the 7M framework – Manpower, Management (professionals and specialists), Materials, Merchandise, Machinery, Money and Movement [Keeling, 2000] – which collectively represent the key inputs required for succesful project execution. Information technology tools support the coordination and optimisation of these resource categories by enhancing visibility, facilitating allocation decisions and enabling more efficient utilisation throughout the project lifecycle. As a result, digitally supported resource planning, enhances organisational control and contributes to greater operational stability in project environments.

Closely related to resource allocation is cost planning, which plays a fundamental role in ensuring the financial feasibility of projects. The dynamic and often unpredictable nature of organisational environments necessitates a strategic approach to financial planning that extends beyond traditional cost management. Within project settings, effective cost planning supports the alignment of financial resources with both immediate operational needs and long-term organisational objectives, thereby enhancing overall project feasibility [Rybak, 2025, p. 450]. Accurate cost estimation enables organisations to anticipate financial requirements, allocate budgets more effectively and reduce the likelihood of cost overruns. Moreover, integrating cost considerations with scheduling and resource planning enhances overall project coherence and supports more informed managerial decision-making. Consequently, information technology tools strengthen cost planning by improving budgeting accuracy, enabling ongoing expense monitoring and supporting more reliable financial forecasting.

Given the inherent uncertainty of project environments, financial planning remains closely intertwined with risk management processes. Effective risk planning enables organisations to anticipate potential threats, reduce uncertainty and enhance the resilience of project plans. Referring to the definition proposed by the European Commission, project risk is „...the probability of a phenomenon or action occurring (...) that may have positive or negative consequences for the course of the entire

project and/or its individual parts" [European Commission, 2004, p. 145]. This perspective highlights that risk is an inherent attribute of projects and therefore requires systematic identification, assessment and response already at the planning stage. Effective risk management contributes not only to the timely and cost-efficient completion of projects but also safeguards organisational resources, protects reputation and supports long-term performance [Temitope, 2024, p. 372]. In this context, information technology tools increasingly support risk planning by enabling structured risk analysis, facilitating scenario modelling and enhancing the early identification of potential threats. Improved access to data and analytical functionalities allows project managers to respond more proactively to emerging uncertainties, thereby strengthening overall project stability. The increasing application of artificial intelligence in project environments further strengthens risk planning by enabling predictive analytics and supporting data-driven decision-making under conditions of uncertainty [Makovsky, 2024, p. 25].

The considerations presented above indicate that information technology tools increasingly support the key dimensions of project planning, including scheduling, resource allocation, cost estimation and risk management. Their application enhances organisational preparedness, improves analytical capabilities and enables more informed managerial decision-making. By facilitating access to real-time data and supporting predictive analyses, digital solutions contribute to greater transparency and stability in project environments. Accordingly, information technology is no longer perceived merely as an operational support mechanism but rather as a strategic enabler of effective project planning.

While effective planning establishes the structural foundation of a project, it is continuous monitoring that determines whether intended objectives are achieved in practice. In today's project environments characterised by increasing complexity and uncertainty, monitoring has evolved from a primarily administrative activity into a critical managerial function supporting informed and timely decision-making. Digital technologies play a central role in this transformation by enhancing data visibility, enabling real-time performance tracking and facilitating faster responses to emerging deviations. As a result, technology-supported monitoring strengthens organisational control while simultaneously improving a project's capacity to adapt to changing conditions. Monitoring, while undertaken at structured intervals, is inherently continuous and functions as a mechanism through which project managers can verify that implementation remains consistent with planned objectives [Pawlak, 2022, p. 85].

Taken together, the analysis of planning and monitoring processes highlights the growing significance of digital technologies in shaping project management

practices. Their integration supports a more structured, transparent and responsive approach to managing projects, enabling organisations to operate more effectively under conditions of increasing complexity and uncertainty. The expanding landscape of technological solutions further illustrates the transition toward digitally supported project environments, where access to timely and reliable information becomes a critical determinant of managerial effectiveness.

While the earlier part of this chapter introduced the *Gartner Magic Quadrant* as a structured overview of major technology providers, table 2 presents selected information technology tools together with their primary applications and core functionalities, offering a more detailed perspective on digital support for project planning and monitoring.

Tab. 2. Selected information technology tools supporting key project management processes

No.	Tool	Primary application	Key functionalities
1.	Microsoft Project	Advanced scheduling and resource planning	critical path analysis, budgeting, reporting, resource management
2.	Asana	Task and workflow coordination	task assignment, progress tracking, team communication
3.	Jira	Agile project management	sprint planning, backlog management, workflow tracking
4.	Trello	Visual workflow management	Kanban boards, task tracking, collaboration
5.	Google Workspace	Collaborative project support	shared files, real-time editing, communication, cloud storage
6.	Monday.com	Collaborative project management	workflow automation, dashboards, reporting
7.	Smartsheet	Project tracking and reporting	resource management, automated updates, performance monitoring

Source: own elaboration based on Bitrix24 (2026) and official software documentation.

Table 2 presents a selection of digital tools that support project planning and monitoring, illustrating the wide range of technological solutions available to modern project managers. However, the effective use of such tools depends not only on their functionalities, but also on the appropriate selection of a solution aligned with project needs and organisational context. It is important to recognise that some platforms require financial investment, while others may involve a learning curve that can temporarily affect implementation efficiency. Therefore, the decision to

adopt a particular tool should be preceded by a careful assessment of project requirements, team competencies and available resources.

Conclusion

The purpose of this article was to analyse the role of information technology tools in supporting project planning and monitoring processes and to identify the areas in which digital solutions contribute to enhancing project management effectiveness. The conducted literature review and subsequent analysis indicate that technological support has become an increasingly important component of contemporary project environments. As organisations operate under conditions of growing complexity and uncertainty, the integration of digital tools appears to strengthen managerial capacity, improve coordination and facilitate more informed decision-making.

The findings suggest that the expanding availability of digital tools reflects a broader transformation in project management practices, moving from predominantly procedural approaches toward more technology-enabled models. Solutions supporting scheduling, resource allocation, cost control and risk management increasingly function as integrated platforms that enhance transparency and support real-time access to project data. This shift indicates that effective project management is no longer determined solely by methodological frameworks, but also by the organisation's ability to leverage technological infrastructure.

Despite its contributions, this study has several limitations. The analysis was based primarily on a review of existing literature and industry reports, which may not fully capture the dynamic evolution of project management technologies. Future research could therefore focus on empirical investigations examining how organisations implement digital tools in practice and how such adoption influences project performance across different industries. Further studies may also explore the long-term impact of emerging technologies, including artificial intelligence, on project management processes.

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Rola narzędzi informatycznych w planowaniu i monitorowaniu projektów

Streszczenie

Skuteczne planowanie i monitorowanie projektów stanowią kluczowe czynniki determinujące pomyślne osiąganie celów projektowych we współczesnych organizacjach. Wraz z rozwojem technologii informacyjnych znacząco wzrosło znaczenie narzędzi informatycznych wspierających kierowników projektów w harmonogramowaniu działań, alokacji zasobów, kontroli kosztów oraz raportowaniu postępów realizacji projektów. Celem niniejszego artykułu jest analiza roli narzędzi technologii informacyjnych w procesach planowania i monitorowania projektów oraz identyfikacja obszarów, w których technologie informacyjne w największym stopniu przyczyniają się do poprawy efektywności zarządzania projektami. Badanie oparto na przeglądzie literatury przedmiotu oraz podejściu opisowo-analitycznym, umożliwiającym uporządkowaną prezentację funkcji i zastosowań wybranych narzędzi informatycznych wykorzystywanych w zarządzaniu projektami. Szczególną uwagę poświęcono narzędziom cyfrowym wspierającym kluczowe procesy zarządzania projektami, zwłaszcza w obszarach planowania, koordynacji zasobów, kontroli kosztów, zarządzania ryzykiem oraz monitorowania realizacji projektów. Artykuł porusza również zagadnienia związane z wyzwaniami i ograniczeniami stosowania narzędzi informatycznych w praktyce projektowej, podkreślając znaczenie kompetencji użytkowników dla ich skutecznego wdrażania. Przedstawione wnioski mogą stanowić podstawę do dalszych badań oraz dostarczać praktycznych implikacji dla praktyki zarządzania projektami.

Słowa kluczowe

zarządzanie projektem, narzędzia informatyczne, planowanie projektu, monitorowanie projektu, harmonogramowanie i kontrola, wydajność projektu