

CURRENT ASPECTS OF PROJECT MANAGEMENT IN A CORPORATION

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Abstract. *The purpose of this study is to conduct a comprehensive analysis of project management practices under conditions of limited resources, with a focus on optimizing time, cost, and quality. Special attention is given to the application of network diagrams as tools for effective scheduling and resource allocation. The research is based on a systems approach, comparative analysis methods, synthesis of practical experience, and examination of interdependencies between scheduling and critical project success factors. Empirical data and case studies are used to validate proposed solutions. The study identifies major challenges related to inefficient project management within traditional organizational structures, such as a lack of alignment between strategic goals and project execution. It proposes practical recommendations for improving resource distribution mechanisms, enhancing flexibility in scheduling, and ensuring stronger integration of project management with corporate strategy. The use of network diagrams allows for the identification of critical operations and optimization of project timelines through resource leveling and activity splitting techniques. This research highlights underexplored aspects of project management—specifically, the dynamic interplay between limited-resource scheduling and critical path flexibility. The novelty lies in the proposed framework that combines adaptive planning techniques with strategic alignment and real-time risk management. It also addresses organizational challenges related to authority distribution and cross-functional coordination in matrix structures. The findings are valuable for enterprises aiming to increase project efficiency in environments with constrained resources and high demand for timely and cost-effective results. The proposed approaches and tools, including network-based planning and resource optimization, can be applied across various industries to improve the success rate of both internal and external projects. Future research should focus on developing advanced decision-support systems that leverage real-time data analytics.*

Keywords: corporation, project management, network diagram, scheduling, limited resources, critical path.

АКТУАЛЬНІ АСПЕКТИ УПРАВЛІННЯ ПРОЄКТАМИ У КОРПОРАЦІЇ

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Анотація. *В сучасних умовах підвищеної конкуренції та швидких змін на ринку ефективне планування і реалізація проєктів набувають особливого значення для забезпечення сталого розвитку підприємств. Метою дослідження є всебічний аналіз ефективних підходів до планування та управління проєктами з особливим акцентом на застосування сіткових графіків як інструменту оптимізації строків виконання, витрат і використання ресурсів. Методика дослідження базується на системному підході, що дозволяє врахувати взаємозв'язки між різними складовими процесу управління проєктом. Використано методи порівняльного аналізу для визначення переваг і недоліків різних способів календарного планування, а також здійснено узагальнення практичного досвіду провідних підприємств. Особливу увагу приділено аналізу взаємозв'язку між календарним плануванням і критичними чинниками успішності проєкту, що допомогло виявити основні проблеми і ризики, притаманні традиційним організаційним структурам управління. Результати дослідження дозволили визначити ключові проблеми, зокрема недостатню гнучкість планування, неефективний розподіл обмежених ресурсів, а також слабку інтеграцію проєктів зі стратегічними цілями підприємств. На основі цих висновків запропоновано конкретні рекомендації щодо вдосконалення механізмів розподілу ресурсів, підвищення адаптивності календарного планування та кращої узгодженості управління проєктами з загальною стратегією розвитку організації. Практична значимість дослідження полягає у можливості застосування його результатів для підвищення ефективності управління проєктами в різних галузях економіки, особливо в умовах обмеженості ресурсів та підвищених вимог до якості, строків і вартості виконання проєктів. Запропоновані підходи сприятимуть оптимізації процесів планування і реалізації, що в кінцевому підсумку підвищить конкурентоспроможність підприємств, для подальшого вдосконалення адаптивного планування проєктів та зниження ризиків за умов обмежених ресурсів.*

Ключові слова: корпорація, управління проєктами, сітковий графік, календарне планування, обмежені ресурси, критичний шлях.

JEL Classification: A100; O220

Introduction. In the current conditions of rapid economic development, technological changes, and increasing competition, more and more organizations face the need to implement effective project management. Unlike ongoing operations, projects are unique, time- and resource-limited, and require coordinated efforts across various functional units. This creates new challenges

for management related to organizational structure, delegation of authority, risk management, resources, deadlines, and quality. In particular, the issue of effective scheduling and the use of network diagrams combined with limited resources requires significant attention. However, in practice, organizations often lack an integrated approach to project management, leading to a gap between strategic goals and actual implementation.

Literature review. Ahmadu, J and others understand that Corporate Social Responsibility guides project management by embedding sustainable practices, encouraging community involvement, and managing social and environmental risks to ensure projects deliver positive impacts beyond just financial results [1].

Alshehadeha, A. R. and others focus that integrating project management with sustainable development is essential for smart cities to achieve sustainable growth, improve quality of life, and promote environmental and social sustainability through effective processes and technologies [2].

Chen, H., Xu, B., Wong, L. Z. R., Zhong, K. investigate how to improve software project effort estimation by applying a novel approach that combines the data element market, feature selection, and reinforcement learning algorithms to overcome the limitations of traditional estimation methods [3].

Elhamahmy, A., Gohar, H. T. H., Galal, A. presents a balanced analysis of barriers and enablers of Sustainable Project Management in the renewable and infrastructure sectors, offering both theoretical insights and practical guidance [4].

Jugdev, K., Müller, R., Hutchinson, M. examine future trends in project management and expect that project management organizations will keep growing and continue offering their specialized knowledge frameworks to the public [5].

Kerzner, H. explains how to effectively plan, schedule, and control projects by integrating various processes and tools to achieve project goals on time and within budget. It emphasizes the importance of strategic alignment, risk management, and performance measurement, making it a key resource for both students and professionals aiming to manage complex projects successfully [6].

Sankaran, S., Drouin, N., Locatelli, G. examine the evolution of project governance, critically reflect on past practices, and offer suggestions for improving governance frameworks and approaches in future project management [7].

Setyopurnomo, R. and others present an innovative approach that integrates earned value management with financial metrics like the income statement and earnings before interest, tax, depreciation, and amortization alongside the work breakdown structure to improve project profitability, enhance information sharing among stakeholders. [8].

The authors Rodriguês, I., Alves, W. emphasize that applying lean thinking principles to information technology project management can effectively reduce waste and improve project efficiency through a customizable conceptual model [9].

Ye, Z., Antwi-Afari, M. F., Tezel, A., Manu, P. conducted a bibliometric and science mapping review on building information modeling in project management to identify mainstream research topics, existing gaps, and future research directions [10].

Identification of unresolved parts of the overall research. Despite active research on project management, several aspects remain insufficiently explored. Specifically, the interrelation between scheduling and resource constraints requires further study, since real conditions often do not consider specific factors affecting schedule flexibility and project delay risks. The use of network diagrams not only as a planning tool but also for dynamic risk management, handling critical operations, and changing priorities is also an underdeveloped area. Additionally, the integration of project management with corporate strategy remains problematic: in practice, there is often no coordinated mechanism for selecting projects aligned with the organization's strategic goals.

Research Objective. The purpose of this study is a comprehensive analysis of the features of project management under limited resources, considering requirements for deadlines, costs, and quality. Special attention is paid to the application of network diagrams as a scheduling tool that enables optimal resource allocation, identification of critical points, and risk reduction. The study also aims to identify organizational, managerial, and structural factors influencing project implementation effectiveness and to propose practical recommendations for aligning project activities with the enterprise's strategic objectives.

Results. In the current environment of dynamic economic development and intense market competition, effective project management gains increasing importance. Organizations must respond flexibly to changes, quickly implement new ideas, and maximally satisfy customer needs. The project approach to management makes it possible to achieve these goals by focusing on the

uniqueness of each task, limited resources, and time frames.

Projects differ from routine organizational activities by having a clearly defined goal, limited duration, and requiring cross-functional teams. Each project is an attempt to implement something new under uncertainty, inevitably accompanied by risks. This makes project management especially relevant in the context of increasing business process complexity, the need for innovation, and continuous improvement.

Moreover, more companies today focus on strategic management, where projects become a tool for achieving long- and short-term goals. Priority management, rational resource allocation, minimizing time and cost expenditures, and ensuring quality are all components of modern project management, which requires solid theoretical grounding and practical refinement.

Special attention should be paid to the use of network diagrams, which provide precise planning and monitoring of project progress, allow timely identification of critical points, optimize costs, and manage risks. Thus, analyzing project management features and planning tools is crucial for successfully implementing both internal and external company initiatives.

Given the above, research on project management is relevant and important both theoretically and practically. It helps better understand mechanisms underlying effective project implementation and contributes to improving management practices across various activity areas.

The primary goal of any project is to satisfy customer needs. This is a key benchmark that distinguishes projects from other organizational activities. Projects have a number of characteristic features ensuring their uniqueness: they are always aimed at achieving a specific objective, have clearly defined start and end points, involve multiple departments and specialists from different fields. Projects typically involve something new, not previously performed, and are characterized by special requirements for timelines, costs, and quality.

Projects differ from routine organizational work in that they have a specific goal and limited execution time. Unlike employees' ongoing duties, a project has a completion point. This means that after achieving the goal, the team either disbands or moves on to a new task. This approach provides flexibility and dynamism in labor organization. Additionally, projects bring together specialists from different fields who may not have shared supervision within the formal structure but effectively collaborate under the project manager's leadership. This format demands high levels of communication, coordination, and adaptability.

Projects always contain unique elements. The degree of uniqueness varies from developing completely new technologies to adapting standard solutions to specific customer conditions. Even the simplest projects cannot be entirely identical due to changing requirements, circumstances, and customer expectations. At the same time, project implementation always involves the triple constraint — time, cost, and quality — which requires continuous balancing. This balance is one of the project manager's most important tasks.

The project manager plays a unique role. They manage temporary, irregular activities that often do not fit traditional organizational structures. The manager's task is to ensure timely project completion within the approved budget, meeting technical and quality parameters. They serve as the main link between the organization and the customer, and the realization of client expectations depends largely on them. The manager must coordinate the entire team's work, often without direct administrative authority over members but possessing necessary organizational powers to achieve results.

Successful project management must be closely connected to the organization's strategic planning. However, in practice, cases occur where strategic goals are formulated by one group of managers, project selection is performed by another, and implementation is assigned to a third. Such disconnection leads to inconsistent decisions and resources wasted on projects that do not bring benefit or profit. In contrast, an integrated project management system envisages close interconnection among all components — goals, strategy, implementation, and evaluation. Changes in one area inevitably affect the whole system. The customer shapes the organization's activity content, and all long- and short-term goals must focus on meeting their needs.

The development of organizational goals and strategy depends on both external and internal factors. External factors include political, social, economic, and technological conditions that outline opportunities and threats. Internal factors comprise managerial capabilities, financial resources, technical support, and staff competencies. Analyzing all these elements allows forming an effective strategy; however, an even greater challenge is implementing it in practice, most often through a system of projects. The number of ideas always exceeds implementation capabilities, making project selection that best aligns with organizational strategy and customer interests a key task. Prioritizing projects enables efficient allocation of limited resources.

Once a project is chosen, the main focus shifts to managing its implementation process. One of the project manager's primary tasks is balancing time, cost, and performance. This requires clear priority-setting, discussed with the customer and management. Whether deadlines, budget, or quality is the highest priority determines subsequent decisions. During project execution, priorities may change, so the manager must be flexible and responsive to new conditions.

Among key project management tools, the network diagram holds an important place. It is a graphical representation showing all project operations, their sequence, interrelations, and time limits. The network diagram visually presents the work plan, identifies the critical path—the longest chain of operations determining overall project duration. It serves as a basis for scheduling, resource allocation, and progress control. It can be easily modified, updated, and communicated to all project participants. Additionally, the network diagram facilitates interaction among all parties, supporting goal achievement.

The network diagram also allows approximate estimation of project duration, identification of possible delay periods or time reserves, and creation of a financing schedule. Using it, critical operations that must be performed without time shifts to complete the project on time are determined. This tool helps assess which stages can be reviewed to shorten the total execution time.

Risks are an integral part of any project. They cannot be completely eliminated even with meticulous planning. In a project context, risk is the probability of an event occurring that may have negative or positive consequences. Some risks can be predicted before project start; others emerge during execution. They may affect deadlines, budget, quality, and other important implementation aspects. The manager must be prepared for such challenges and have strategies to minimize their impact.

Sometimes, there is a need to shorten project timelines. This often requires accelerating critical operations, leading to additional costs. In such cases, a choice arises: save time at the expense of increased budget or vice versa. This may also affect quality, requiring especially careful control. When resources are limited, scheduling becomes more complex. Calendars built considering resource constraints help optimize workloads, reduce downtime, and increase project implementation efficiency.

When creating a project schedule with limited deadlines, special attention is focused on efficient resource use. Fluctuating demand for a particular resource type complicates management and leads to inefficient use. This problem is usually solved by resource leveling, which smooths or balances resource demand. Essentially, all leveling methods involve delaying non-critical operations, reducing peak resource loads, and compensating shortages.

However, the downside is the loss of network schedule flexibility due to reduced time reserves for tasks. This increases the risk of project delays, as the number of critical and near-critical operations grows. Leveling typically uses operations with the largest time reserves, as they involve lower risks. Nevertheless, other important factors—such as decreased network elasticity during resource redistribution and operation specifics—are often overlooked. Therefore, multiple options usually need to be considered before selecting the one best suited to the specific project and minimizing delay risks. Even a small project with several resource types can have thousands of possible solutions.

Similar to resource leveling, scheduling under limited resources often reduces downtime but also lowers schedule elasticity since downtime is used to minimize delays. This leads to an increase in critical and near-critical operations. Scheduling complexity grows due to combined technical and resource constraints—operation start times depend on both. Under such conditions, the traditional concept of sequential critical path execution from project start to finish loses relevance. Resource constraints can disrupt normal sequence, leading to disconnected critical operations or transforming parallel tasks into sequential ones. Operations with time reserves may shift from critical to non-critical status and vice versa.

One scheduling method to enhance resource use efficiency is task fragmentation or parallelization. The project manager interrupts continuous operation execution, temporarily reallocates resources to another task, then returns them to complete the previous one. This approach can be very effective if costs associated with starting, stopping, and resuming work are not significant, e.g., with highly skilled personnel or specialized equipment.

In summary, project management is a complex multifaceted discipline requiring comprehensive consideration of organizational, strategic, technical, and resource aspects. It aims to ensure timely, high-quality, and cost-effective project execution, contributing to the organization's competitive advantage and long-term success.

Conclusion. In today's fast-paced and competitive business environment, project management has emerged as a vital discipline for achieving organizational goals, fostering innovation, and maintaining a strategic edge. The complexity and uniqueness of projects, combined with limited resources and time constraints, require organizations to adopt a structured and adaptive management approach. This study highlights the critical role of network diagrams in optimizing project schedules, allocating resources efficiently, and managing risks, especially under real-world constraints.

Despite significant advancements in project management methodologies, there remain key areas that demand further attention—particularly the dynamic interaction between resource constraints and scheduling, and the alignment of project activities with broader corporate strategy. Bridging the gap between strategic intent and practical implementation is essential for ensuring that projects deliver real value and support long-term organizational development.

Moreover, the role of the project manager is shown to be pivotal in balancing the triple constraint of time, cost, and quality while coordinating cross-functional teams in a flexible, often decentralized environment. Tools like network diagrams, when used effectively, enable not only precise planning and monitoring but also greater responsiveness to change and uncertainty.

Ultimately, project management must be viewed as both a strategic and operational function. By aligning project selection and execution with customer needs and organizational priorities, companies can maximize the benefits of each initiative. This integrated and informed approach to managing projects ensures resilience, promotes sustainable growth, and enhances overall performance in an increasingly complex global landscape.

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