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INTEGRATION OF MODERN METHODOLOGIES WITH PMO IN THE MANAGEMENT OF INVESTMENT PROJECTS

BABAYEV I., Doctor of Technical Sciences, professor.

E-mail: igbal.babayev@azmiu.edu.az; ORCID: 0000-0002-1787-7859;

Scopus ID: 57200315471

QULUZADA S., Master student.

E-mail: quluzadeselcan001@gmail.com; ORCID: 0009-0005-5420-2489

Azerbaijan University of Architecture and Construction, Ayna Sultanova st.,
11, Baku, Azerbaijan.

Abstract. *The integration of modern project management methodologies within Project Management Offices (PMOs) is crucial for enhancing investment project management. Traditional PMO structures often struggle to meet the demands of agility, efficiency, and risk mitigation required in dynamic environments. This study examines the role of PMOs in investment projects, particularly in infrastructure, energy, and technology, highlighting the challenges posed by uncertain market conditions, regulatory constraints, and technological disruptions. To address these challenges, organizations are increasingly integrating Agile, Lean, Scrum, Kanban, and hybrid methodologies within the PMO framework. These methodologies improve project success rates by optimizing resource allocation, enhancing stakeholder engagement, and facilitating data-driven decision-making. Agile PMO structures, in particular, enable iterative planning, rapid adaptation, and effective risk management, making them well-suited for investment projects facing high uncertainty. Despite the growing interest in modern methodologies, challenges remain in harmonizing these approaches within PMO structures. This study explores key opportunities, obstacles, and success factors associated with such integration. It highlights the importance of fostering an agile mindset within project teams and aligning PMO functions with strategic organizational goals. The findings suggest that integrating contemporary methodologies into PMO frameworks enhances project governance, improves efficiency, and increases competitiveness. The study also emphasizes the role of digital tools and sustainability principles in modern investment project management. By adopting innovative, flexible, and structured approaches, organizations can maximize value creation, optimize decision-making, and ensure long-term project success.*

Key words: *Project Management Office, investment projects, modern methodologies, systematic management approaches, success factors.*

Introduction. The dynamic and complex nature of modern investment projects necessitates a structured yet adaptive approach to project management. In this context, the Project Management Office (PMO) has emerged as a crucial element in ensuring governance, standardization, and alignment with organizational strategy. However, traditional PMO

structures often struggle to keep pace with the increasing demands for agility, efficiency, and risk mitigation in investment project management. Given the rapidly changing economic environment, the need for effective, flexible, and optimized implementation of investment projects has become more pressing than ever.

Investment projects, particularly in sectors such as infrastructure, energy, and technology, face challenges related to uncertain market conditions, regulatory constraints, technological disruptions, and stakeholder complexity. As a centralized structural unit, the PMO applies systematic approaches to project management and plays a key role in the successful delivery of projects. However, since conventional project management methods are no longer effective in this dynamic landscape, organizations must adopt modern methodologies—such as Agile, Lean, Kanban, PRINCE2, and hybrid frameworks—within the PMO framework. This integration enhances project success rates, optimizes resource allocation, and improves stakeholder engagement by incorporating flexibility, data-driven decision-making, and continuous improvement principles.

Despite growing interest in combining modern methodologies with PMO functions, there remains a gap in understanding how different methodologies can be harmonized within a PMO structure to maximize their benefits. This study provides a comprehensive analysis of PMO functions, contemporary methodologies, and their role in investment project management, highlighting both opportunities and challenges in their implementation.

The Project Management Office (PMO) serves as a critical organizational structure for standardizing project management practices, ensuring alignment with strategic goals, and optimizing resource utilization. In the context of investment project management, the integration of modern methodologies with PMO functions has gained increasing significance. Given the complexity of large-scale investment projects—particularly in infrastructure, energy, and technology—traditional management methods often prove insufficient in addressing the challenges posed by dynamic market conditions, regulatory constraints, technological disruptions, and multi-stakeholder environments.

Analysis of recent research and publications. The primary functions of the PMO can be categorized into three key areas: (1)

establishing standardized project management procedures, (2) providing methodological support to project teams, and (3) collecting and analyzing project-related data. These are the main goals of establishing a Project Management Office both in Azerbaijan and worldwide [1]:

1. Increase project success.
2. Create a structure for the organization to achieve its strategic goals.
3. Improve project management standards.
4. Efficiently use material, technical, human, etc. Resources.
5. The experience of the project team, organizational culture, and the application of modern methodologies directly affect the effectiveness of the PMO.

A well-structured PMO is inherently dynamic, supporting agile methodologies and facilitating the effective coordination of complex investment projects. It plays a pivotal role in risk mitigation, managing dependencies, and ensuring systematic project execution. To maximize efficiency and adaptability, it is essential to integrate contemporary methodologies such as Agile, Lean, Scrum, and Kanban into PMO frameworks. These approaches enhance workflow tracking, optimize resource allocation, and promote continuous improvement, ultimately contributing to more effective project governance. Table 1 outlines the key aspects of integrating these methodologies with PMO functions.

Table 1

Key Aspects of Integrating Modern Methodologies with PMO

Methodology & PMO	Agile & PMO	Kanban & PMO	Scrum & PMO	Lean & PMO
Enhancing PMO agility	Increases adaptability	Enables real-time workflow tracking	Provides structured sprint planning	Optimizes production processes
Project execution and sprint cycles	Organizes iterative work cycles	Manages workload efficiently	Facilitates Sprint planning and execution	Reduces waste in production
Performance evaluation	Assesses sprint outcomes	Accelerates issue resolution	Enhances team collaboration	Utilizes value stream mapping tools

Source: [3; 4; 5]

The strategic development and adoption of PMO frameworks integrated with these modern methodologies in Azerbaijan will not only enhance project execution capabilities but also contribute to broader economic growth. By improving the efficiency and success rates of complex projects, this approach strengthens the national economy, fosters innovation in project management, and supports the sustainable development of investment initiatives.

One of the modern management approaches is the Agile methodology. This methodology, mainly by responding quickly to customer needs, allows project team members to operate freely and create an effective work environment. Another approach is the Scrum methodology. Within this Agile framework, teams' work activities, specific roles, and rapid communication are convenient. The Kanban methodology focuses on teams' easy management of workload, visualization of workflow, and efficient use of resources. The Lean methodology aims to increase customer value, minimize waste, and make the project profitable [3; 4; 5].

In another table 2, the application opportunities and obstacles of integrating modern methodologies with PMO, as well as the key success indicators, are analyzed with the analysis of relevant literature. The integration of modern methodologies creates conditions for increasing the competitiveness and efficiency of organizations.

Table 2

Opportunities, Obstacles, and Success Factors in Integrating Modern Methodologies with PMO

Opportunities	Obstacles	Success factors
Increase agility	Struggle against change	Applying an approach that is agile and aligned with the organization's strategic goals
Improve product quality	Lack of relevant skills	Regularly measuring results
Accelerate time to market	Lack of support from management	Increasing employee training and development
Increase customer satisfaction	Organizational culture	High-level management
Increase employee engagement levels		Predicting and minimizing risks

Source: [3; 4; 5]

In investment projects associated with volatile market conditions and high risks, unlike traditional project management approaches, Agile PMO is of great importance and carries out certain functions under the agile strategy of the organization. Investment projects are projects that require large capital and resources, where the main role of the PMO is to perform both management functions and advise on agile methodologies, as well as support.

As a result of the analyzed literature [2; 6], it can be concluded that Agile PMO teaches ways to increase business value by using appropriate tools, managing agile processes and risks with best practices, and allowing the project manager to make more optimal and faster decisions.

In other literature reviewed [7; 8], while traditional approaches: work schedules, plans, and Gantt charts struggle against the speed of the project, using adaptive and iterative planning approaches through the Scrum agile program, which is a member of advanced methods, is more effective for investment projects, because these projects face difficult to predict and dynamic factors. As a result, this approach makes it easier for team members to act according to the remaining goals within the time and budget, to update plans regularly, and to make investment decisions faster. Another main function is to create added value, the literature review shows that with the principle of minimum cost and maximum benefit, Agile PMO should analyze and realise the benefits gained at each stage of investment projects, as a result, unlike these traditional approaches, it helps to deliver value, properly direct resources, and prioritize work [9].

When considering relevant aspects from the relevant literature reviewed, Agile PMO helps to synchronize with the organization's long-term goals, as well as promote project portfolio management, linking project leaders to strategic goals, and managing investment projects based on the right leadership approaches. [10; 11] Furthermore, [12; 13] the analysis of the literature ultimately leads to the idea that the application of agile approaches should not only be through teaching methodologies, but also this change should be formed in the mindset of the project team, this mindset should be developed and integrated into the organizational culture, and projects should be managed with innovative, agile, and creative approaches.

The scope and objectives of the article. The objective of this article is to explore the integration of modern project management methodologies within the framework of Project Management Offices to enhance the management of investment projects in Azerbaijan. By examining the application of these methodologies across various industries, particularly in the construction sector, the article aims to highlight the role of PMOs in ensuring flexibility, resource optimization, and strategic alignment. The study seeks to identify best practices for the adoption of hybrid approaches, digital tools, and sustainability principles to improve project efficiency, stakeholder engagement, and long-term project success.

Statement of the main material of the research. Effective project management using agile methodologies is crucial for enhancing customer satisfaction and ensuring long-term success in Azerbaijan's highly competitive markets. The widespread adoption of modern management approaches—Agile, PMI, PRINCE2, and Waterfall—across various industries in Azerbaijan enables companies to improve flexibility, resource management, and operational efficiency. As shown in Table 3, different organizations leverage these methodologies to optimize their processes and better respond to market demands.

Table 3

Application of Management Approaches in Companies in Azerbaijan

Company	Management approaches	Application
Azercell, Bakcell	Agile, PMI, hybrid	Ability to make rapid changes, meet customer needs, structured approach in IT and mobile projects
SOCAR, Gilan Holding	PMI, Waterfall	Systematic monitoring of processes, efficient management of resources
PASHA Holding	Agile, PMI, Prince2	PRINCE2 methodology in finance and investment, Agile prevails in digital projects
Bank Respublika, Xalq Bank	Agile, PMI	Development of information systems, customer services, efficient management of income and expenses

Project management with agile methodologies is essential for increasing customer satisfaction and ensuring the long-term success of

projects in highly competitive markets in Azerbaijan. The application of modern management approaches, such as Agile, PMI, PRINCE2, and Waterfall, across various companies and industries in Azerbaijan contributes to achieving positive outcomes by enhancing flexibility, resource management, and process efficiency. As evidenced by the companies in the table, the adoption of these approaches enables organizations to adapt to changing market needs, improve operational effectiveness, and meet customer demands more effectively.

The evolving nature of project management practices has led to the emergence of modern methodologies such as Agile, Lean, Scrum, and Kanban. These approaches emphasize adaptability, continuous improvement, and strategic alignment, which are particularly crucial in dynamic environments like the construction sector. While traditional project management methodologies, such as Waterfall, provide structured frameworks for managing projects, they often lack the flexibility needed to address rapidly changing conditions. This gap has paved the way for the integration of more flexible and iterative methodologies, supported by the governance and standardization frameworks provided by PMOs. In Azerbaijan, this integration is particularly relevant given the country's rapidly developing infrastructure, which demands a flexible and adaptive project management approach.

Agile methodologies, which originated in software development, are gaining traction in the construction industry due to their emphasis on iterative progress and flexibility. In Azerbaijan, construction projects frequently encounter delays due to factors such as regulatory approvals, resource shortages, and environmental concerns. These challenges necessitate a more adaptive approach to project management that can respond to changes quickly. To effectively integrate Agile into construction projects, large-scale projects can be broken down into smaller, manageable phases using frameworks such as Scrum or Kanban. Each phase should be treated as a mini-project, with its own goals, timelines, and deliverables. By applying Agile techniques, construction teams can adapt more swiftly to unexpected changes, such as design modifications or resource allocation adjustments. The PMO plays a critical role in facilitating the adoption of Agile within the organization. This includes providing training, tools, and frameworks that are tailored to the specific needs of the construction industry. Additionally, the PMO ensures

alignment between Agile teams and the overarching project objectives, fostering seamless communication across all phases of the project.

Lean principles, which focus on minimizing waste while maximizing value, are particularly valuable in resource-intensive industries like construction. Given Azerbaijan's focus on improving cost-effectiveness in the construction sector, the application of Lean practices can significantly enhance the efficiency of projects, contributing to both better outcomes and reduced operational costs. Key Lean tools such as Value Stream Mapping (VSM) and Just-In-Time (JIT) delivery can be implemented to streamline workflows, reduce inefficiencies, and optimize resource utilization. The integration of sustainability-driven practices, such as the use of eco-friendly materials and energy-efficient construction techniques, can further enhance the value delivered by these projects. The PMO is responsible for monitoring the implementation of Lean principles, ensuring that waste reduction initiatives are aligned with the project's broader objectives and stakeholder expectations. The PMO also helps maintain consistency and focus across multiple project phases.

Hybrid methodologies offer a balanced approach that combines the structure of traditional project management with the flexibility of Agile and Lean. This is particularly useful for large-scale construction projects in Azerbaijan, where both detailed planning and adaptability are essential. Hybrid methodologies can be applied by using Waterfall during the initial phases of planning and design, where detailed documentation and clear project timelines are essential. Once execution begins, Agile and Lean methods can be introduced to accommodate the dynamic nature of the construction environment and optimize resource allocation. The PMO acts as the bridge between these methodologies, ensuring smooth integration and facilitating communication across different project phases. It also ensures that both traditional and modern approaches are aligned and that the transition between methodologies is seamless.

The integration of modern methodologies with digital tools further enhances the capabilities of PMOs. Technologies such as Building Information Modeling (BIM), digital twins, and data analytics platforms enable real-time monitoring, risk management, and decision-making. These tools offer construction project teams the ability to gain better insight into the project's progress and make more informed decisions.

BIM can be adopted for collaborative design and construction planning, while digital twins create virtual replicas of construction projects, allowing for real-time monitoring and predictive analytics. Data analytics platforms can be leveraged to track trends, optimize resource allocation, and identify potential risks. The PMO oversees the implementation of these digital tools, ensuring that they are effectively integrated into the project's workflow. It also ensures that all stakeholders have access to relevant data and that digital tools are used to support project goals.

Successful project management requires effective stakeholder engagement, especially in complex construction projects. In Azerbaijan, where projects often involve multiple government bodies, contractors, and suppliers, fostering collaboration among stakeholders is crucial to project success. A comprehensive stakeholder engagement plan should be developed, ensuring that stakeholders are continuously informed and involved in the decision-making process. Techniques such as stakeholder mapping and sentiment analysis can help identify key players and address their concerns in a timely manner. The PMO ensures that stakeholder engagement strategies are integrated into the overall project management approach. By establishing regular communication channels and feedback loops, the PMO ensures that stakeholders' needs and expectations are met throughout the project lifecycle.

With growing global concerns over environmental impacts, sustainability has become a central focus of construction projects worldwide. In Azerbaijan, integrating sustainability into project management can ensure that construction projects have minimal environmental impact while delivering long-term benefits to society. Sustainability criteria should be incorporated into every phase of project planning and execution. Tools like Life Cycle Assessment (LCA) can be used to evaluate the environmental impact of materials and construction processes, ensuring that sustainability goals are met. The PMO is responsible for monitoring the sustainability initiatives throughout the project. By ensuring that sustainability practices align with the project's objectives and regulatory requirements, the PMO helps drive the adoption of green building practices and reduces the project's environmental footprint.

To maximize project efficiency, organizations must implement a set of structured strategies that align contemporary methodologies with digital transformation and sustainability principles:

- Development of competencies – continuous professional development of project teams through training in Agile, Lean, and Hybrid methodologies enhances their capability to manage complex projects effectively.

- Implementation of digital tools – the utilization of Building Information Modeling (BIM), digital twins, and analytical platforms enables real-time monitoring, risk assessment, and process optimization, leading to data-driven decision-making.

- Effective stakeholder management – establishing structured stakeholder engagement strategies fosters transparency, ensures continuous feedback, and enhances the consideration of diverse stakeholder interests throughout all project stages.

- Integration of sustainable development principles – the adoption of environmentally friendly materials, project life cycle assessments, and impact minimization strategies contributes to sustainable project execution.

- Optimization of methodological synergies – the integration of structured Waterfall planning with Agile and Lean methodologies in implementation phases enhances adaptability and methodological efficiency.

The successful adoption of these strategies provides a foundation for improving project outcomes. However, sustaining long-term project performance necessitates a focus on PMO optimization.

To ensure the PMO effectively supports project execution and strategic goals, organizations should implement the following key measures:

1. Adoption of hybrid approaches – combining Lean principles for process optimization with Scrum-based team management facilitates balanced resource allocation and increased project adaptability.

2. Professional development of PMO specialists – continuous training programs enable PMO personnel to effectively apply and customize Agile methodologies to industry-specific requirements.

3. Performance monitoring and analytics – the integration of digital tools allows for real-time tracking of PMO efficiency, providing data-driven insights into the success of applied methodologies.

4. Evaluation of implemented methodologies – regular assessment of project success indicators, including adherence to timelines, budget

constraints, and stakeholder satisfaction, supports iterative improvements in management strategies.

5. Enhancement of communication between the PMO and project teams – developing transparent information exchange processes accelerates decision-making and enhances project responsiveness.

6. Cultivation of a continuous improvement culture – establishing mechanisms for periodic evaluation and refinement of project management approaches fosters knowledge accumulation and best practice adoption.

These suggestions are aimed at not only improving the efficiency of current projects but also establishing a foundation for the successful adaptation of PMOs in the face of changes in the external environment and new challenges in managing investment projects.

Conclusions. As a result of integrating modern management methodologies with PMO functions in Azerbaijan, as well as in international practice, high performance and effectiveness in managing investment projects are ensured. This integration contributes to the economic development of the country by enhancing the potential for attracting investments and creating an important strategic mechanism for project monitoring, timely completion, and efficient resource management.

It is important to note that the successful implementation of this integration requires not only expert support but also strong backing at the strategic level, which includes active participation from leadership and the allocation of necessary resources.

For successful integration, it is essential to develop competencies in project management, including employee training and the development of PMO as a key organizational element. Leadership at all levels should be the primary driver of change, supporting the adaptation of modern management methodologies and ensuring necessary financial and human resources.

Implementing such approaches in project management in Azerbaijan represents a crucial step towards long-term development and modernization of the sector. The integration of modern project management methodologies, such as Agile, Lean, and hybrid approaches, within the strategic optimization of PMOs leads to improved project efficiency, greater flexibility, and long-term sustainability. Organizations

that successfully adopt these approaches will be able to enhance their competitiveness and remain resilient in dynamic market conditions.

Future research directions should include the empirical validation of these recommendations based on the analysis of specific industry examples, particularly in sectors of strategic importance for Azerbaijan's economy, such as energy, construction, and infrastructure. Systematically aligning modern project management methodologies with PMO optimization will allow enterprises to achieve a higher level of operational excellence, responsiveness, and strategic alignment.

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ІНТЕГРАЦІЯ СУЧАСНИХ МЕТОДОЛОГІЙ З РМО В УПРАВЛІННІ ІНВЕСТИЦІЙНИМИ ПРОЄКТАМИ

БАБАЄВ І. А., доктор технічних наук, професор.

E-mail: igbal.babayev@azmiu.edu.az; ORCID: 0000-0002-1787-7859;
Scopus ID: 57200315471

КУЛУЗАДА С., магістрант.

E-mail: quluzadeselcan001@gmail.com; ORCID: 0009-0005-5420-2489

Азербайджанський університет архітектури та будівництва, вул. Айна Султанова, 11, м. Баку, Азербайджан.

***Анотація.** Динамічний і складний характер сучасних інвестиційних проєктів вимагає структурованого, але водночас адаптивного підходу до управління. У цьому контексті Офіс управління проєктами (РМО) відіграє ключову роль у стандартизації процесів, забезпеченні відповідності стратегічним цілям організації та оптимізації використання ресурсів. Однак традиційні методи управління проєктами часто виявляються недостатньо ефективними в умовах стрімко мінливого ринкового середовища, нормативних обмежень, технологічних змін і складних взаємодій зі стейкхолдерами. У цій статті розглядається інтеграція сучасних методологій управління проєктами, таких як Agile, Lean, Kanban і гібридних підходів, у діяльність РМО для підвищення ефективності управління інвестиційними проєктами.*

Автори аналізують основні функції РМО, включаючи стандартизацію процедур, методологічну підтримку проєктних команд і збір даних для аналізу, а також досліджують переваги використання гнучких методологій в управлінні інвестиціями. Результати дослідження показують, що адаптація сучасних підходів до управління проєктами дає змогу підвищити рівень гнучкості і швидкість ухвалення рішень, оптимізувати використання ресурсів, мінімізувати ризики та підвищити задоволеність зацікавлених сторін. У статті виокремлено ключові можливості та бар'єри інтеграції сучасних методологій у діяльність РМО, а також визначено чинники успіху їх застосування. Особливу увагу приділено специфіці реалізації таких підходів в Азербайджані, включно з впливом на конкурентоспроможність підприємств, ефективність інвестицій та сталий розвиток. Отримані висновки можуть бути корисними як для дослідників, так і для практиків у сфері управління проєктами.

***Ключові слова:** Офіс управління проєктами, інвестиційні проєкти, сучасні методології, системні підходи до управління, фактори успіху*



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