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Methodology for Managing High-Urgency Projects in Conditions of National Importance

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Abstract

The study is aimed at the theoretical substantiation of an adaptive hybrid methodology combining predictive principles and elements of iterative delivery to optimize the full lifecycle of national projects with high urgency. The relevance of the study is determined by the acute need for reliable tools for managing critically important projects and the existence of a theoretical gap between the capabilities of known methodologies and the specific requirements for national-scale projects. As a result of a systematic analysis of key scientific publications and analytical reports in recent years, a multi-level management architecture is proposed, integrating strategic planning and control (characteristic of Waterfall/PRINCE2) with iterative execution mechanisms and operational adjustments at the tactical level (borrowed from Agile/Scrum). The aim of the study is to substantiate an adaptive hybrid methodology focused on effective management of high-urgency and nationally important projects. The scientific novelty consists in integrating cascade and agile approaches into a single adaptive model aimed at improving the efficiency of implementing urgent projects of national importance.

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The obtained results will be of practical interest for leaders of governmental bodies, top managers of state-participated enterprises and researchers in the field of project management in the public sector.

Keywords: project management; national significance projects; high urgency; hybrid methodology; Agile, Waterfall; PRINCE2; risk management; public sector; decision-making.

1.Introduction

The effectiveness of implementing large-scale, capital-intensive, and time-critical national-level projects serves as one of the primary indicators of the operability of the public administration system and its capacity to respond adequately to internal and external challenges. Projects spanning domains from construction and digital transformation to healthcare reorganization and the strengthening of defence capabilities are accompanied by a complex set of unique difficulties: a multi-level system of approvals, involvement of a large number of stakeholders with differing priorities, stringent budgetary and regulatory constraints, as well as heightened scrutiny from the public and politicians. Statistical data from recent years indicate the presence of systemic gaps in this field. The Project Management Institute (PMI) Pulse of the Profession® 2024 report emphasizes the absence of a universal means to achieve success: adaptability and the selection of a methodology tailored to the specific characteristics of the project and its environment play the key role [4]. As a result, a theoretical gap emerges: classical predictive (waterfall) methodologies such as PMBOK or PRINCE2, which ensure a high level of control and documentation, prove to be excessively rigid and inertial under conditions of significant uncertainty and the need for rapid response to changes [7], whereas agile approaches, which have demonstrated their effectiveness in IT development through iterativeness and a focus on rapid feedback, encounter serious difficulties

when scaled to national-level projects due to insufficient formalization, challenges in long-term budget planning, and non-compliance with government reporting requirements [3].

The objective of this study is to substantiate an adaptive hybrid methodology oriented towards the effective management of projects characterized by high urgency and national significance.

The scientific novelty of the work lies in the proposal of a methodological approach that integrates the strategic rigidity of predictive models at the macro level with the tactical flexibility of iterative practices at the micro level, which is expected to enhance the efficiency of implementing especially critical projects.

It is hypothesized that the application of a hybrid methodology will reduce the risks of schedule slip and budget overruns, accelerate the response to changes in the external and internal environment, and thereby increase the likelihood of successfully achieving the stated objectives of national projects compared to the use of exclusively predictive or exclusively agile methods.

Despite the theoretical justification of the approach, this study has a number of methodological limitations. The proposed model constitutes a conceptual construct built on the basis of a comprehensive analysis and synthesis of existing practices and scientific publications. Its practical effectiveness remains subject to further empirical validation within the framework of real-world projects. Moreover, the success of implementing this model depends directly on the characteristics of national, political and organizational contexts, which significantly narrows its universality and imposes the necessity of adaptation to the specific conditions of each individual case.

2.Materials and methods

In contemporary practice of high-urgency project management particular attention is given to the selection of methodological approaches that enable flexible and effective responses to rapidly changing external conditions. In the literature four main research directions can be distinguished.

The first direction is associated with the application of agile, lean and combined (hybrid) methodologies. Thus, Najar T. [1] investigates the impact of lean-agile supply chain innovations on performance indicators through the lens of dynamic capabilities, innovation potential and partner relationships. Gemino A., Horner Reich B., Serrador P. M. [3] in comparing traditional, agile and hybrid methods show that the hybrid approach does not always ensure an average quality result, and often lags behind both classical and agile methodologies. Almeida F., Bálint B. [11] analyze methods of scaling agile in the IT industry, emphasizing the role of organizational culture and technological infrastructure in successful hybrid implementation. Ciric Lalic D. and his colleagues [12] , considering the influence of methodology selection on project success, confirm that the transition from traditional to agile practices contributes to shortened timelines and increased team engagement, however requires serious preparation and restructuring of management processes.

In this body of research a profound paradox of contemporary hybridization becomes evident: although the idea of integrating different practices seems entirely justified, its rudimentary implementation — a simple mixture of techniques without consideration of systemic connections — frequently ends in failure. This attests to the fact that the decisive factor is not the mere attempt at hybridization but the design of a coherent, architecturally precise model capable of distinctly separating the levels and regulations for applying various approaches, thereby minimizing the accompanying risks.

The second direction covers classical standards and the evolution of project management. Griffin M. B., Thomas J. Y., McMurtrey M. E. [2] consider the future of the project manager profession, noting that the combination of PMI standard competencies and agile skills becomes critically important in the context of high-urgency national projects. Simonaitis A., Daukšys M., Mockienė J. [7] compare PRINCE2 and PMBOK in the management of repetitive construction projects, revealing that PMBOK provides greater universality in phases and processes, whereas PRINCE2 is more structured and formalized, which at times slows decision-making under tight deadlines. Ngo J., Hwang B. G. [8] focus on project management knowledge and skills with smart technologies, emphasizing the necessity of interdisciplinary competencies and mastery of digital tools to ensure operational control and real-time adaptation.

A comprehensive analysis of the works included in this section demonstrates that the time-tested project management standards PMBOK and PRINCE2 maintain their viability as foundational frameworks but no longer fully satisfy the demands of contemporary dynamism. Consequently, the creation of an "superstructure" composed of adaptive competencies and digital skills acquires central importance, complementing classical principles and extending their functionality. In other words, an effective methodological system should not discard traditional approaches but integrate them within a multilayered management architecture, combining structural rigor and control mechanisms with flexibility and rapid responsiveness to change.

The third direction is sustainable development, stakeholder engagement and team building. Shaukat M. B. and his colleagues. [5] demonstrate that sustainable project management correlates with its success through the mediation of active stakeholder interaction and effective team formation, especially in socially significant initiatives. The guidance of the Mental Health Commission of Western Australia provides methodological recommendations for planning stakeholder

engagement in the period 2021–2025, which is especially relevant when working with national projects involving a wide range of participants [10].

This research vector underscores the importance of intangible components of success, which frequently lie beyond the purview of purely technical approaches. The main conclusion is that the tools for engaging key stakeholders and constructing effective teams cannot be delineated as autonomous processes — they must be organically integrated into the methodological structure. This is particularly critical in the hybrid model, where the goal is to ensure seamless interaction between management levels and working groups.

The fourth direction concerns risk management and issues of corporate and public governance of large projects. The PMI report Pulse of the Profession® 2024 emphasizes the absence of a universal means to achieve success [4]. The IRM Risk Trends 2025 report systematizes current trends in risk management, accentuating attention on cyber risks, geopolitical instability and supply chain resilience [6]. The analysis of lessons learned from mega-project management by the UK National Audit Office underscores the importance of transparent corporate governance mechanisms and accelerated decision-making in crisis conditions [9].

A systematic review of research in this area demonstrates that risk management procedures and corporate governance principles do not constitute an isolated phase of project activity but rather possess a cross-cutting, integrative character. In the context of national-scale projects subject to significant geopolitical and regulatory influences, this imposes a requirement on the leadership model: it must include embedded mechanisms for continuous monitoring and early threat detection at the tactical (operational) level, followed by their immediate escalation to strategic instances, thereby ensuring the prompt and well-founded decision-making by top management.

Thus, the literature offers diverse approaches – from purely agile to formal classical methodologies and their hybrid forms, and also emphasizes the importance of sustainable development and risk management. Meanwhile publications reveal contradictions: some authors recommend hybrid methods as optimal under urgency conditions, others demonstrate their comparative inefficiency; PMBOK and PRINCE2 standards are assessed as universal and at the same time requiring adaptation; at the same time, questions of integrating risk management approaches with agile practices are insufficiently studied. Poorly covered are topics of the influence of the national legislative context on methodology adaptation, as well as methodologies for evaluating the effectiveness of managing high-importance projects in a multicultural environment.

3.Results and Discussion

Based on the results of the analysis and identification of existing problems, an adaptive hybrid methodology for the management of urgent national projects (AHM-UNP) is proposed. Its architecture relies on a two-tier structure that clearly delineates the strategic (macro) and tactical (micro) management contours.

Thus, at the macro level a predictive (waterfall) paradigm analogous to PRINCE2 is applied, and responsibility for governance rests with the project's senior management, i.e. the steering committee comprising representatives of key ministries and state corporations. The principal tasks of this level are as follows:

1. Formulation and ratification of the project's strategic orientations and framework conditions: establishment of the end-state product vision, key performance indicators (KPI), mandated deadlines and maximum budget, all of which remain constant throughout implementation.
2. Stage-by-stage planning: decomposition of the lifecycle into major,

logically complete phases (e.g., Initiation; Design and Expert Review; Material and Technical Provision; Construction/Development; Commissioning), with progression to the next phase permitted only upon approval of the preceding phase's outcomes by the steering committee.

3. Allocation and control of resources and budget at the macro level, ensuring coordinated and efficient utilization of principal financial and material assets.
4. Identification of strategic risks (political, economic, regulatory) and development of comprehensive mitigation measures.
5. Organization of engagement with principal stakeholders to secure political and administrative support for the project [1, 7, 8].

This approach guarantees the required level of transparency and accountability of national projects, as well as their full alignment with long-term state strategies, creating a rigid frame within which the necessary tactical flexibility is possible.

At the micro level, corresponding to the tactical contour, operations within each of the strategically defined phases are organized based on Agile methodologies. Direct operational management is entrusted to project teams under the supervision of the project manager. This level possesses the following main characteristics:

1. Iterative approach. Each major phase is divided into a series of short cycles (sprints) typically lasting from two to six weeks. At the beginning of each sprint the team formulates a clear and quantitatively measurable target (product increment) toward which it strives by its completion.
2. Backlog management. All work within the phase is detailed down to individual tasks and accumulated in a backlog. Before each sprint, in collaboration with the product owner (the customer representative at the tactical level), backlog items are prioritized for inclusion in the sprint plan.

3. Cross-functional teams. Self-sufficient groups of specialists are formed, possessing the set of competencies necessary for the autonomous resolution of sprint tasks.
4. Continuous feedback. Daily short meetings (daily stand-ups), demonstrations of results at the end of each sprint and subsequent retrospectives enable timely identification of emerging obstacles, knowledge sharing and adjustment of plans for subsequent cycles [2, 5].

The synchronization of the strategic and tactical levels occurs through established control points timed to the completion of each macrophase. At these stages the results obtained through the iterative execution of tasks at the tactical level undergo formal acceptance by the strategic level. The steering committee evaluates the extent to which the obtained results conform to the overall objectives of the project and makes a decision to proceed to the subsequent phase.

The proposed AGM-SNP model combines the advantages of strategic planning and agile management. The visualization of its structure is provided in Figure 1.

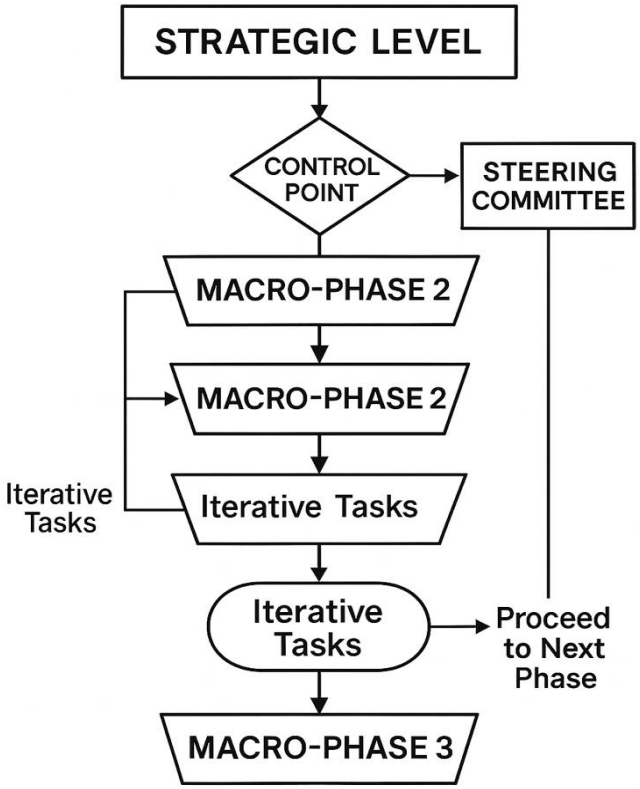

Figure 1: Structure of the AGM-SNP model (compiled by the author based on [1, 8, 11, 12])

Fixed phased structure provides management with the necessary level of control and the ability to forecast accurately, whereas within each phase the implementation of cyclic iterations affords execution teams the required adaptability to address complex and ambiguous tasks under conditions of limited initial data and rapid changes.

A crucial condition for the effective implementation of AGM-SNP is the correct determination of the prevailing methodological approach based on the unique characteristics of the specific project phase. In this context it is proposed to apply the selection matrix (Figure 2).

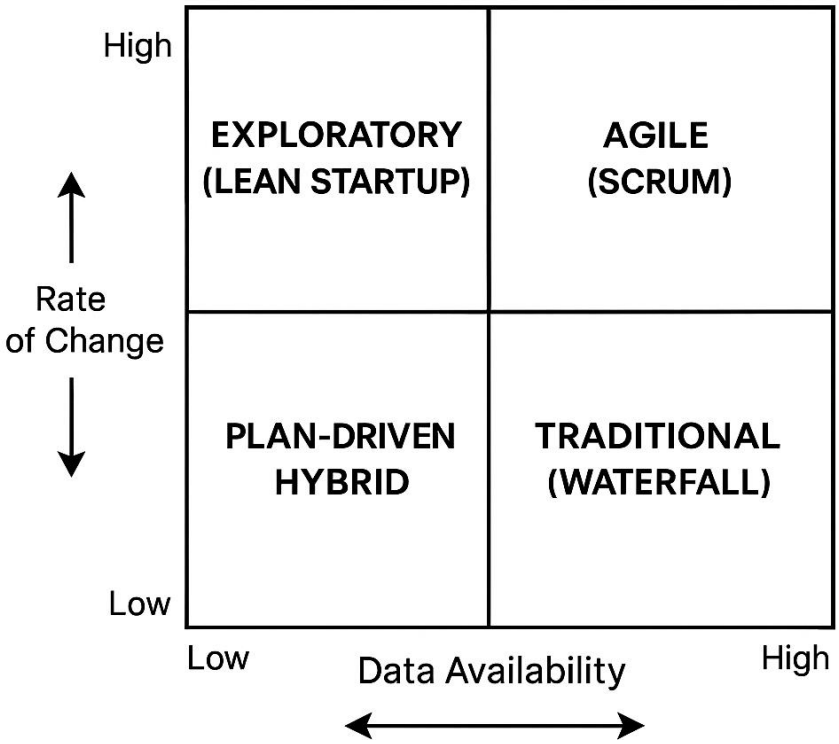

Figure 2: Choice matrix (compiled by the author based on the analysis of [3, 6, 8, 9])

In the Design and expertise phase, where constant refinement of requirements takes place and a high degree of technological uncertainty persists, active application of agile methodologies appears to be the most rational.

Conversely, during the Construction phase of a standard facility according to approved documentation, where technical requirements are unambiguously defined and processes are well established, the management model is built predominantly on a predictive approach with a strictly regulated work schedule.

Comparative analysis of AGM-SNP and classical methodologies is presented in Table 1.

Table 1: Comparative analysis of methodologies in the context of urgent national projects (compiled by the author based on [3, 10, 11, 12])

Criterion	**Traditional approach (Waterfall/PRINCE2)**	**Agile approach (Agile/Scrum)**	**Adaptive Hybrid Methodology (AHM-SNP)**
Adaptability to change	Low. Changes require a complex re-approval procedure.	High. Changes are welcomed and integrated in subsequent iterations.	Medium/High. High at the tactical level, controlled at the strategic level.
Predictability (schedule, budget)	High at the planning stage but often low in practice due to inflexibility.	Low in the long term, high within a single sprint.	High at the macro level (phases), flexible at the micro level (sprints).
Level of control and accountability	High. Clear hierarchy and detailed documentation.	Low/Medium. Emphasis on team self-organization.	High. Strategic control maintained with tactical freedom.
Speed of value delivery	Low. Results available only at the end of the project.	High. Delivery of working increments at the end of each sprint.	Medium. Delivery of significant, completed parts of the project at the end of phases.
Compliance with governmental regulation	High. Easily integrates into bureaucratic systems.	Low. Requires significant adaptation of the regulatory framework.	High. The strategic contour fully meets the requirements.

In practical implementation of the AGM-SNP model the primary task becomes overcoming the deep cultural-process gap between the two closed management loops. To achieve this it is necessary not only to formalize the key procedures but also to establish informal communication channels and to develop a unified strategic vision understandable and accepted by all participants — from the

supervisory board to the engineering groups.

The second serious obstacle is the need to develop dual competencies among project leaders. A manager in the context of AGM-SNP must operate bilingually with the Agile toolkit and terminology (backlog, velocity, sprint review) when interacting with the team and at the same time translate the operational data obtained into the language of budgets, timeframes and strategic risks for senior management. Such a role demands deep integration of predictive and adaptive approaches, which imposes new requirements on the training and certification systems for managerial personnel in the public sector.

The third key aspect is related to the development of an adequate set of performance metrics. Traditional Waterfall KPI (for example, percentage of plan execution) do not reflect the real value created during Agile sprints whereas purely agile indicators (for instance, team velocity) remain minimally informative at the strategic level. In this regard within the framework of AGM-SNP it is necessary to form a multi-level hierarchy of indicators: operational metrics must be aggregated into tactical indicators which in turn will form the basis of strategic evaluation.

At the same time the expected benefits of implementing AGM-SNP are increased organizational adaptability, acceleration of key processes and an increased probability of successful implementation of critically important projects .

4.Conclusion

The analysis conducted demonstrated that neither classical waterfall models nor purely flexible methodologies are capable of independently guaranteeing effective management under conditions in which scale, stringent reporting, high uncertainty, and limited timeframes coincide.

The result of the work was the proposal of an adaptive hybrid methodology (AGM-SNP), in which the best elements of predictive and Agile approaches are systemically synthesized. The proposed two-tier architecture separates the strategic (waterfall) management level and the tactical (iterative) loop. At the strategic level, strict control, long-term planning, and compliance with government regulations are ensured, forming the rigid framework of the project. The tactical level, based on the principles of iterative development, imparts the system with the necessary flexibility, accelerates response to external changes, and improves the quality of decision-making under conditions of incomplete information.

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