

UDC 65.012.122

OVERCOMING BARRIERS TO INTEGRATING AGILE AND WATERFALL: LESSONS FROM A HYBRID PROJECT IN KAZAKHSTAN

Saduakas A.Z.

Master's student, 7M04102, Project Management, Astana IT University,
Astana, Kazakhstan

Scientific Supervisor: Koitanova A.

As modern project environments become more complex, the demand for hybrid project management approaches—combining the structure of classical methodologies with the flexibility of Agile—has increased. However, organizations face significant barriers when attempting to integrate these fundamentally different paradigms. This article explores the key obstacles to successful integration and offers practical strategies for overcoming them, drawing on a real-world case study from Kazakhstan's GSC Study Corporation. The research combines content analysis, semi-structured interviews, and expert validation through the Delphi Method. Findings highlight several major challenges, including cultural resistance, coordination difficulties, and limited hybrid expertise. The study demonstrates how these barriers were addressed through leadership engagement, training, role clarification, and iterative adaptation. This paper contributes to the growing literature on hybrid project management by offering practical, evidence-based recommendations for organizations aiming to adopt integrated approaches in transitional and emerging markets.

Key words: Agile, Waterfall, Hybrid Project Management, Integration Barriers, Organizational Change, Kazakhstan, Delphi Method.

Introduction

Project management has undergone significant evolution in the 21st century, moving from rigid, plan-driven approaches to more adaptive, iterative methods. Classical methodologies such as Waterfall remain effective for projects requiring extensive documentation, regulatory compliance, and long-term predictability. In contrast, Agile methodologies—especially in software development—prioritize flexibility, stakeholder collaboration, and iterative progress. The theoretical and practical divide between these two schools of thought is widely acknowledged.

In recent years, organizations have increasingly sought to reconcile these approaches through hybrid project management models. These models attempt to

harness the strengths of both methodologies, offering a balance between control and responsiveness. However, transitioning to a hybrid model is not a straightforward process. Integrating Agile and Waterfall presents numerous organizational, cultural, and operational challenges. Many hybrid initiatives fail or underperform due to resistance from teams, leadership inertia, lack of methodological understanding, and coordination failures.

This article investigates the barriers organizations face when integrating Agile and Waterfall methodologies and how they can be overcome in practice. It focuses on a hybrid digital project implemented by GSC Study Corporation in Kazakhstan, an EdTech company engaged in digital transformation. The case offers insights into the local organizational culture, hybrid workflow experimentation, and the processes used to resolve integration challenges.

By analyzing this project, the study contributes to both theoretical discourse and practical application. It offers lessons for organizations in emerging markets aiming to adopt hybrid methodologies, where institutional rigidity, skill gaps, and structural inertia often complicate innovation.

Literature Review

2.1 Contrasting Methodologies: Agile and Waterfall

Waterfall remains a dominant classical methodology. It emphasizes sequential development phases, detailed documentation, and a clear distinction between planning and execution. While ideal for well-defined projects with stable requirements, it lacks adaptability and rapid feedback mechanisms.

Agile methodologies, by contrast, encourage flexibility, continuous delivery, and close stakeholder engagement. Scrum, Kanban, and other Agile frameworks have gained widespread use in software and innovation-driven industries. However, Agile is often criticized for its limited documentation, difficulties in scaling, and unsuitability for compliance-heavy environments.

2.2 Emergence of Hybrid Approaches

Hybrid Project Management (HPM) seeks to combine Agile's responsiveness with Waterfall's structure. Frameworks such as SAFe and DAD exemplify formalized attempts at integration. Studies (Ambler & Lines, 2012; Leffingwell, 2010) show that hybrid approaches are particularly effective in medium-to-large organizations managing complex digital or cross-functional projects.

Yet, despite growing interest, hybrid methodologies are under-theorized. Many implementations lack strategic planning, result in team confusion, or revert to de facto adherence to one methodology.

2.3 Barriers to Integration

Scholars and practitioners have identified several recurring barriers:

- Cultural resistance: Agile values often conflict with hierarchical or formal cultures.

- Coordination complexity: Integrating workflows between iterative and linear processes demands sophisticated planning.
- Skill and knowledge gaps: Teams unfamiliar with either Agile or Waterfall may struggle to implement hybrid systems effectively.
- Leadership ambiguity: Inconsistent support or misunderstanding of hybrid principles by senior management can undermine adoption.

Understanding how these barriers manifest in practice—and how they can be mitigated — is critical for hybrid success.

Methodology

A three-phase qualitative design was employed:

1. Content Analysis: Secondary sources (case studies, white papers, and industry reports) on hybrid practices at Siemens, Microsoft, SAP, and Philips were analyzed to identify known integration barriers and response strategies.
2. Semi-Structured Interviews: Twelve interviews were conducted with project participants from GSC Study Corporation, including developers, analysts, managers, and executives. Interview questions explored personal experiences with hybrid methods, perceived challenges, and organizational responses.
3. Delphi Method: A panel of 12 experts (internal and external) reviewed findings and iteratively refined recommendations for overcoming integration barriers. Three rounds were conducted, leading to strong consensus on best practices.

Data triangulation ensured reliability, and ethical standards were maintained through informed consent and anonymization of participant data.

Case Study Context: GSC Study Corporation

GSC Study Corporation is a Kazakhstani EdTech company focused on English language education and overseas consulting. In 2024, it launched a major project to develop a digital learning platform. The project involved multiple teams—developers, designers, marketers, business analysts, and senior management—and aimed to deliver a scalable product in a dynamic market.

The organization opted for a hybrid project management approach to accommodate:

- Regulatory requirements and investor reporting (Waterfall)
- Fast-paced feature development and feedback loops (Agile)

Waterfall techniques were used for phase planning, milestone tracking, and documentation. Agile elements — such as 2-week sprints, daily stand-ups, and user-centered design iterations — were applied at the task execution level.

The project became a live experiment in hybrid integration, offering insight into both obstacles encountered and strategies employed to overcome them.

Barriers to Integration

The project team encountered several major obstacles during the transition to hybrid practices.

Cultural Resistance: Developers and analysts with strong backgrounds in either Agile or Waterfall often resisted the hybrid model. Agile proponents found the milestone constraints restrictive, while Waterfall-oriented staff viewed the sprint system as chaotic. Initially, teams operated in silos, lacking shared understanding of hybrid workflows.

Coordination Challenges: Sprint cycles did not always align with the high-level milestone timeline. This led to missed deliverables, conflicting priorities, and duplication of effort. The absence of clear communication protocols between teams following different rhythms resulted in delays.

Knowledge Gaps: Team members often lacked familiarity with one of the methodologies. Some had never participated in stand-ups or sprint reviews, while others were unfamiliar with Gantt charts or formal change control processes.

Leadership Inertia: Senior management supported the hybrid model in principle but hesitated to intervene in operational conflicts. Without strong leadership engagement, friction between departments escalated.

These barriers created tension, reduced morale, and threatened project success.

Strategies to Overcome Barriers

The project team implemented several strategies to address these issues.

Training and Knowledge Sharing: A series of internal workshops were launched to cross-train staff in both Agile and classical practices. Documentation was streamlined, and terminology was standardized across departments. Mixed-method training helped reduce fear and confusion.

Role Clarification and Communication: A hybrid governance structure was introduced, specifying who owns what at each level. A dedicated integration coordinator ensured alignment between macro planning (Waterfall) and micro execution (Agile). Regular sync meetings replaced ad hoc communication.

Iterative Adaptation: Rather than enforce a rigid hybrid structure, the organization adopted a flexible learning approach. Agile elements were gradually scaled up, and Waterfall components were simplified where appropriate. This allowed teams to experiment and self-adjust.

Leadership Activation: Senior leaders began attending sprint demos and milestone reviews, actively promoting a culture of collaboration. Their presence helped resolve conflicts, clarify goals, and legitimize the hybrid process.

As a result of these measures, team collaboration improved, delivery pace stabilized, and trust across departments increased. By the third project quarter, most team members expressed preference for the hybrid model over their original methods.

Conclusions

This study explored the real-world challenges and solutions involved in integrating Agile and Waterfall methodologies within a single hybrid framework. Using a Kazakhstani EdTech project as a case study, the research demonstrated how cultural resistance, coordination difficulties, skill gaps, and leadership ambiguity can impede hybrid adoption.

However, the findings also show that these barriers are not insurmountable. With appropriate training, governance structures, leadership commitment, and adaptive iteration, hybrid project management can enhance project outcomes—even in transitional organizational cultures.

By focusing not only on methodology but also on organizational behavior and change management, this research provides a deeper understanding of what it truly means to bridge Agile and classical approaches. It offers a practical blueprint for organizations seeking to modernize their project practices without discarding their legacy structures.

REFERENCES

1. Ambler, S. W., & Lines, M. (2012). *Disciplined Agile Delivery: A Practitioner's Guide to Agile Software Delivery in the Enterprise*. IBM Press.
2. Bredillet, C. N. (2008). Beyond the PMBOK Guide. *Project Management Journal*, 39(3), 42–51.
3. Boehm, B., & Turner, R. (2004). *Balancing Agility and Discipline: A Guide for the Perplexed*. Addison-Wesley.
4. Cuofano, W. I. G. (2024). Spotify Model and Why It Matters in Business. *FourWeekMBA*.
5. Highsmith, J. (2004). *Agile Project Management: Creating Innovative Products*. Addison-Wesley.
6. Hofstede, G. (2001). *Culture's Consequences: Comparing Values, Behaviors, Institutions, and Organizations Across Nations*. Sage Publications.
7. Leffingwell, D. (2010). *Agile Software Requirements: Lean Requirements Practices for Teams, Programs, and the Enterprise*. Addison-Wesley.
8. Schwalbe, K. (2018). *Information Technology Project Management* (8th ed.). Cengage Learning.
9. Standish Group. (2015). *CHAOS Manifesto*..

AGILE ЖӘНЕ WATERFALL ӘДІСТЕРІН БІРІКТІРУДЕГІ КЕДЕРГІЛЕРДІ ЕҢСЕРУ: ҚАЗАҚСТАНДАҒЫ ГИБРИДТІ ЖОБАНЫҢ САБАҚТАРЫ

Садуакас А.Ж.

Мақалада жобаларды басқаруда Agile және Waterfall әдістерін біріктіру барысында ұйымдар тап болатын практикалық қиындықтар қарастырылады. Зерттеу Қазақстандағы GSC Study Corporation компаниясының мысалында жүргізіліп, мәдени қарсылық, үйлестірудің күрделілігі және білім жетіспеушілігі сияқты негізгі кедергілер талданды. Контент-талдау, жартылай құрылымдалған сұхбаттар және Делфи әдісі арқылы сараптамалық бағалау негізінде табысты гибридті модельді енгізу стратегиялары анықталды. Нәтижелер интеграцияланған жобаларды басқару әдістерін қолданғысы келетін дамушы нарықтағы ұйымдарға арналған практикалық ұсыныстар ұсынады.

Кілт сөздері: Agile, Waterfall, жобаларды басқарудың гибридті моделі, интеграция кедергілері, ұйымдық өзгерістер, Қазақстан, Делфи әдісі.

ПРЕОДОЛЕНИЕ БАРЬЕРОВ ИНТЕГРАЦИИ AGILE И WATERFALL: УРОКИ ИЗ ГИБРИДНОГО ПРОЕКТА В КАЗАХСТАНЕ

Садуакас А.Ж.

В статье рассматриваются практические трудности, с которыми сталкиваются организации при интеграции методологий Agile и Waterfall в управлении проектами. На основе кейса компании GSC Study Corporation (Казахстан) анализируются ключевые барьеры, включая культурное сопротивление, сложности координации и нехватку знаний. С помощью контент-анализа, полуструктурированных интервью и экспертной валидации методом Делфи выявлены стратегии успешной реализации гибридной модели. Результаты предоставляют практические рекомендации для организаций развивающихся рынков, стремящихся внедрить интегрированный подход к управлению проектами.

Ключевые слова: Agile, Waterfall, гибридное управление проектами, барьеры интеграции, организационные изменения, Казахстан, метод Делфи.

Список использованной литературы

1. Амблер С., Лайнс М. Disciplined Agile Delivery: Руководство для практиков по гибкой разработке программного обеспечения в корпоративной среде. IBM Press, 2012.
2. Бредийе К. Н. За пределами PMBOK: новые подходы к управлению проектами // Project Management Journal. – 2008. – Т. 39, № 3. – С. 42–51.
3. Бём Б., Тёрнер Р. Баланс между гибкостью и дисциплиной: руководство для сомневающихся. – М.: Addison-Wesley, 2004.
4. Куофано У. Модель Spotify и её значение для бизнеса // FourWeekMBA. – 2024.
5. Хайсмит Дж. Гибкое управление проектами: создание инновационных продуктов. – М.: Addison-Wesley, 2004.
6. Хофстеде Г. Последствия культуры: сравнение ценностей, поведения, институтов и организаций в разных странах. – М.: Sage Publications, 2001.
7. Леффингвелл Д. Agile Software Requirements: Lean-требования для команд, программ и предприятий. – М.: Addison-Wesley, 2010.
8. Швалбе К. Управление проектами в области информационных технологий. – 8-е изд. – М.: Cengage Learning, 2018.
9. Standish Group. CHAOS Manifesto 2015. – 2015.