



PROJECT INTEGRATION GOVERNANCE FOR MANAGING FRAGMENTATION IN HYBRID ENVIRONMENTS

Rasa Žilienė

Klaipėda University, Lithuania

Abstract

Contemporary project environments increasingly combine specialized digital platforms, decentralized teams, hybrid project-management methods and multi-level governance arrangements. Although such heterogeneity can strengthen flexibility and local adaptation, it also increases the need for integration. Existing project-management research examines complexity, hybrid methodologies, information overload, knowledge transfer and governance, but these streams provide only a partial explanation of the cumulative coordination problem created when tools, information, methods, knowledge and decision rights are insufficiently connected. The purpose of this study is to conceptualize project management fragmentation (PMF) as a multidimensional integration problem and to propose a Project Integration Governance framework for limiting its dysfunctional effects while preserving useful flexibility. An exploratory qualitative expert survey was administered during April–May 2026. The analytical sample comprised 12 experienced project-management professionals with 7–18 years of experience, predominantly from service-intensive sectors. Open-text responses were analyzed through deductive-inductive thematic coding and cross-case comparison. Five recurring dimensions of PMF were identified: tool and system fragmentation, data and information fragmentation, methodological fragmentation, knowledge fragmentation, and governance and decision-right fragmentation. Coordination-related costs represented the most recurrent consequence (11 of 12 expert accounts), while data and information fragmentation was reported by 10 experts, tool/system fragmentation by 9, methodological fragmentation by 7, knowledge fragmentation by 8, and governance/responsibility fragmentation by 8. Decision latency and rework were repeatedly reported as downstream effects. The findings suggest that heterogeneity is not equivalent to fragmentation. Fragmentation emerges when the integration capacity of a project environment becomes insufficient relative to the heterogeneity that must be coordinated. On this basis, Project Integration Governance is proposed as a cross-cutting response comprising information, technological, methodological, knowledge and governance integration. The study further develops the principle of Minimum Viable Standardization: organizations should standardize the interfaces necessary for coherence - authoritative information sources, common data definitions, decision rights and escalation rules - while retaining flexibility in team-level working practices and specialized tools. The study contributes a theoretically grounded framework for explaining how fragmented project environments generate coordination overload and provides practical guidance for PMOs, programme managers and governance designers. The proposed causal pathway is interpretive rather than statistically tested and should be validated in larger quantitative and cross-sector studies.

KEY WORDS: project management fragmentation, project integration governance, hybrid project management, project governance, coordination, digital transformation.

JEL classification: M10, M15, O33

Introduction

Contemporary project management increasingly takes place within heterogeneous organizational environments. Project teams simultaneously use specialized task-management platforms, collaboration applications, document repositories, enterprise systems, spreadsheets and client-specific reporting solutions. At the same time, project delivery increasingly combines Agile, predictive and organization-specific governance practices, while decision-making is distributed across project managers, product owners, functional managers, sponsors, risk functions and steering committees. Each of these elements may individually support effective project delivery; collectively, however, they generate substantial requirements for integration.

Digital transformation has intensified this development. Digital technologies can increase organizational responsiveness, transparency and analytical capability, but successful transformation depends on the integration of technologies with organizational processes, structures and competences rather than on technology adoption alone (Parviainen et al., 2017; Mergel et al., 2019; Chen et al., 2025). Recent research further demonstrates that project management offices themselves operate as boundary-

spanning actors during digital transformation, facing tensions between established governance arrangements and emerging digital practices (Simard and Aubry, 2025).

A related transformation concerns the widespread use of hybrid project-management approaches. Empirical studies show that Agile and predictive practices increasingly coexist rather than function as mutually exclusive alternatives (Gemino et al., 2021; Marnewick and Marnewick, 2023). Systematic reviews similarly indicate that practical knowledge concerning successful implementation of hybrid project management remains dispersed and context-dependent (Reiff and Schlegel, 2022; Székely et al., 2025). Recent research on customized hybrid methodologies demonstrates that effective hybridization depends on deliberate integration of practices according to project context rather than mechanical combination of methods (Mirzaei et al., 2025). Studies of Agile-hybrid implementation also identify organizational misalignment, unclear processes and insufficient integration between organizational objectives and project practices as recurring challenges (Sithambaram et al., 2021).

Existing project-management scholarship nevertheless approaches the resulting coordination problem through several largely distinct research streams. Project-

complexity research examines differentiation, interdependence, uncertainty and the management difficulties associated with complex project structures (Baccarini, 1996; Vidal and Marle, 2008; Bjorvatn and Wald, 2018). Information-overload research focuses primarily on situations in which information-processing demands exceed individual or organizational processing capacity (Eppler and Mengis, 2004). Project-governance research considers the allocation of authority, accountability and governance structures (Too and Weaver, 2014; Müller et al., 2016). Knowledge-management research addresses the difficulties of retaining and transferring knowledge between temporary projects and permanent organizations (Disterer, 2002; Schindler and Eppler, 2003; Prado and Sapsed, 2016; Barbosa et al., 2022). Studies of virtual project teams further emphasize communication, collaboration technologies and knowledge-sharing challenges in digitally mediated environments (Swart et al., 2022).

The present study argues that these perspectives illuminate different parts of a broader integration problem. The existence of multiple tools, methodologies, actors or information sources does not necessarily constitute a management failure. Heterogeneity may increase flexibility, specialization and adaptability. A problem arises when the interfaces between heterogeneous elements are insufficiently integrated, causing project actors to spend excessive effort reconciling information, translating between management processes, clarifying authority and reconstructing fragmented knowledge.

Recent work on systems integration in project networks provides evidence that project performance depends on several complementary integration mechanisms, including systems, knowledge, relational, governance and process integration (Lei, 2025). However, the project-management literature has paid less attention to the inverse condition: how insufficient integration across several internal project-management dimensions accumulates into a distinct pattern of fragmentation, and where the boundary lies between productive heterogeneity and dysfunctional fragmentation.

The scientific problem addressed in this study is therefore formulated as follows: *how does insufficient integration among heterogeneous project-management elements create fragmentation, through which mechanisms does this fragmentation affect project coordination and performance, and which governance mechanisms can mitigate its negative consequences without eliminating beneficial flexibility?*

Three research questions guide the study:

RQ1: What dimensions characterize project management fragmentation in digital and hybrid project environments?

RQ2: Through which mechanisms does project management fragmentation affect coordination, decision-making and project performance?

RQ3: Which Project Integration Governance mechanisms can mitigate dysfunctional fragmentation while preserving beneficial project flexibility?

The research object is contemporary project management in digital and hybrid organizational environments. The research subject comprises the dimensions, manifestations, consequences and integration mechanisms associated with project management fragmentation.

The purpose of the study is to conceptualize project management fragmentation in digital and hybrid project environments and to propose an integration governance framework explaining its dimensions, consequences and mitigation mechanisms.

The objectives are to distinguish project management fragmentation from related project-management concepts; identify its principal dimensions through theoretical and expert evidence; explain the mechanisms through which fragmentation influences project coordination and decision-making; and formulate governance principles capable of reducing dysfunctional fragmentation without unnecessarily restricting project-level flexibility.

The study uses an exploratory qualitative expert-survey design and thematic cross-case analysis. Its theoretical contribution is twofold. First, project management fragmentation is conceptualized as a multidimensional integration problem rather than as a synonym for project complexity or digital-tool proliferation. Second, the study develops the proposition that productive heterogeneity becomes dysfunctional fragmentation when integration capacity becomes insufficient relative to the diversity that must be coordinated. The practical contribution consists of a Project Integration Governance framework and the associated principle of Minimum Viable Standardization.

Theoretical background

Digital and hybrid project environments

Digital transformation changes both the technological infrastructure and the organizational conditions under which projects are managed. Digitalization is not simply the conversion of analogue processes into digital formats; it involves changes to processes, organizational structures, stakeholder relationships and managerial practices (Mergel et al., 2019). Project management therefore increasingly operates through interconnected technological and organizational systems.

A recent systematic review of digital transformation in project management identifies the integration of digital technologies into project processes and organizational routines as an important emerging research area (Chen et al., 2025). At the organizational level, the benefits of digitalization depend on the coordinated transformation of processes, data, competences and organizational structures (Parviainen et al., 2017). This means that additional digital capabilities simultaneously generate additional integration requirements.

The same principle applies to hybrid project management. Hybrid approaches combine Agile and predictive practices in order to exploit complementary benefits rather than adhere to a single methodological logic (Gemino et al., 2021; Reiff and Schlegel, 2022). Their use has become increasingly established in project practice (Marnewick and Marnewick, 2023). More recent studies demonstrate that successful hybridization requires context-specific configuration and active management of interfaces between methodologies (Mirzaei et al., 2025; Székely et al., 2025).

Consequently, methodological plurality should not itself be interpreted as fragmentation. Hybrid management becomes problematic when different planning cycles,

reporting requirements, roles and governance routines co-exist without explicit mechanisms for synchronization.

Fragmentation and integration in project management

Integration has long been recognized as central to managing project complexity. Baccarini's observation that "project complexity can be defined in terms of differentiation and interdependency" and is managed through integration remains particularly relevant to contemporary project environments (Baccarini, 1996, 201). Project complexity therefore provides an important starting point, but complexity and fragmentation should not be treated as equivalent.

Project complexity describes characteristics such as multiplicity, differentiation, interdependence, uncertainty and dynamic interaction (Baccarini, 1996; Vidal and Marle, 2008). Empirical evidence indicates that complexity can adversely affect schedule and cost performance when project-team capabilities are insufficient to absorb it (Bjorvatn and Wald, 2018). Fragmentation, in contrast, concerns the quality of connections between elements that already exist within the project-management environment.

Project Integration Management similarly emphasizes the need to coordinate project processes and activities (Project Management Institute, 2017). The concept examined in this study is broader in a different direction: it concerns fragmentation across the socio-technical project-management architecture, including digital systems, information structures, methodologies, organizational knowledge and decision authority.

Information fragmentation also differs from information overload. Information overload occurs when the volume or complexity of information exceeds available processing capacity (Eppler and Mengis, 2004). Fragmentation may occur even when the total information volume is manageable, for example when several systems contain incompatible versions of project status or when it is unclear which source is authoritative.

Based on these distinctions, "Project management fragmentation (PMF)" is defined in this study as: "*the condition in which heterogeneous project-management elements are insufficiently integrated, generating additional coordination, information-processing and governance costs and reducing the ability of project actors to maintain coherent project understanding, decision-making and control*".

This definition conceptualizes fragmentation as a relational condition. Multiple systems or methodologies are not fragmented merely because they are different; fragmentation emerges when the connections needed to coordinate their differences are inadequate.

Organizational information processing and coordination

Organizational Information Processing Theory provides the main theoretical explanation for this distinction. Galbraith (1974) proposed that organizational design must align information-processing capacity with the information-processing requirements generated by uncertainty and interdependence. Tushman and Nadler (1978)

similarly emphasized that organizational differentiation increases the need for integrating mechanisms.

Applied to projects, increasing heterogeneity expands integration requirements. More systems create more data interfaces; more specialized actors create more coordination interfaces; hybrid methodologies create more process interfaces; and distributed decision authority creates more governance interfaces. When organizational integration capacity grows at a slower rate than these requirements, fragmentation can occur.

Coordination Theory complements this explanation. Malone and Crowston (1994) conceptualised coordination as the management of dependencies between activities. Fragmented project environments increase the number or difficulty of dependencies requiring active management. Examples include reconciling duplicated data, translating between reporting structures, synchronising Agile delivery cycles with predictive governance cycles and clarifying overlapping decision rights.

Knowledge integration represents a related challenge. The knowledge-based view conceptualises organizations as mechanisms for integrating specialized knowledge distributed among individuals (Grant, 1996). This requirement is especially pronounced in project-based organizations because projects are temporary organizational forms and their dissolution creates risks of knowledge discontinuity (Turner and Müller, 2003). Project-learning research repeatedly demonstrates that knowledge is difficult to capture, retain and transfer across project boundaries (Disterer, 2002; Schindler and Eppler, 2003; Prado and Sapsed, 2016; Barbosa et al., 2022).

From heterogeneity to dysfunctional fragmentation

Heterogeneity can be valuable. Specialized knowledge, differentiated technological tools and adaptable methodologies can increase local effectiveness. Organizational ambidexterity similarly depends on maintaining differentiated activities while preserving sufficient integration at organizational level (O'Reilly and Tushman, 2008).

The key distinction proposed here is therefore: *Heterogeneity + sufficient integration → flexibility and adaptability*, whereas: *Heterogeneity + insufficient integration → dysfunctional fragmentation*.

This formulation implies an integration-capacity boundary rather than a fixed numerical threshold. As heterogeneity increases, the mechanisms connecting diverse project-management elements must become sufficiently capable to preserve coherent action.

This perspective also explains why complete standardization is unlikely to represent an optimal solution. Eliminating heterogeneous systems or methodologies may reduce integration requirements, but it may also eliminate specialized capabilities and contextual adaptability. The relevant management question is therefore not how to maximize standardization, but which interfaces must be standardized or integrated to preserve coherence.

The present study uses the term "Minimum Viable Standardization" to describe this principle: organizations establish the minimum mandatory standards required for cross-project coherence while retaining local flexibility where variation creates value.

Research methods

Research design

An exploratory qualitative research design was used to investigate how experienced project-management professionals perceive and experience fragmentation in digital and hybrid project environments. A qualitative design was selected because the study aims primarily to clarify the boundaries, dimensions and mechanisms of an emerging conceptual phenomenon rather than estimate its prevalence in a defined population.

The empirical study was conducted through a qualitative expert survey administered during April and May 2026. The survey was designed to capture professional accounts of fragmented project-management practices, their perceived causes and consequences, and organizational mechanisms used to mitigate them.

The qualitative approach is consistent with the objective of developing and refining concepts from information-rich expert evidence (Patton, 2015). The textual responses were analyzed using thematic principles derived from Braun and Clarke (2006).

Sample composition and adequacy

The final analytical sample comprised 12 project-management professionals with between 7 and 18 years of

project-management experience (Table 1). Respondents held senior roles including Senior Project Manager, Program Manager, Head of PMO, Portfolio Manager, Agile Delivery Manager, Transformation Project Manager and Delivery Manager.

The sample was predominantly service-oriented. Ten of the twelve respondents represented service-sector organizations, including IT services, consulting, financial services, shared services, SaaS, professional services, logistics, marketing and creative services, insurance and IT outsourcing. The remaining respondents represented telecommunications and public/administrative services, both characterized by substantial project-based activity.

The study did not use statistical sample-size calculation because the purpose was qualitative conceptual exploration rather than population-level inference. Sample adequacy was considered in relation to the specificity of the respondents' expertise, the diversity of represented project contexts and the recurrence of thematic patterns across cases. This logic is consistent with the principle that qualitative sample adequacy depends on the information richness of the material rather than statistical power alone (Malterud et al., 2016). No claim of statistical representativeness is made.

Table 1. Profile of project management experts

Expert	Sector	PM experience	Position / role	Organization type
E1	IT services	14 years	Senior Project Manager	International company
E2	Consulting services	11 years	Program Manager	Consulting company
E3	Financial services	16 years	Head of PMO	Bank
E4	Business services centre	9 years	Project Manager	Shared services organization
E5	Telecommunications	13 years	Portfolio Manager	Large enterprise
E6	IT / SaaS	8 years	Agile Delivery Manager	Technology company
E7	Professional services	18 years	PMO / Transformation Lead	International company
E8	Logistics services	12 years	Project Manager	Logistics company
E9	Marketing / creative services	7 years	Project Lead	Agency
E10	Insurance services	15 years	Transformation Project Manager	Insurance company
E11	IT outsourcing	10 years	Delivery Manager	Service company
E12	Public / administrative services	17 years	Program Manager	Large organization

Data collection

The expert survey was administered during April and May 2026. The qualitative component invited respondents to describe their experience of fragmentation within contemporary project environments, including problems related to project-management tools and systems, information and reporting, coexistence of different management methodologies, project knowledge, governance and decision rights.

Respondents were also asked to identify perceived causes and consequences of fragmentation and practices they considered effective for reducing it. Particular attention was paid to coordination effort, delays in decision-

making, duplicated work, information inconsistency and the balance between standardization and project-team flexibility.

The survey was structured to avoid defining fragmentation too narrowly in advance. This allowed respondents to identify fragmentation according to their own project-management experience while simultaneously addressing dimensions derived from the theoretical review.

Respondents are anonymized in the article using codes E1–E12, and organizational names are not disclosed.

The survey was distributed online via Google Docs during April–May 2026. Fifteen project management experts from Lithuania were invited to participate, and 12 completed responses were included in the analysis. The questionnaire was administered in Lithuanian. Informed

consent was obtained at the beginning of the survey, where participants were informed about the purpose of the study, voluntary participation, confidentiality and the use of anonymized responses for scientific research.

Data analysis

The textual survey material was analyzed using a deductive-inductive thematic approach. The analysis proceeded through four main stages.

First, all responses were reviewed to identify recurring descriptions of project-management fragmentation, its causes, consequences and possible solutions. Second, an initial coding structure was informed by the theoretical literature on project integration, complexity, information processing, project governance and knowledge management. Third, additional codes were retained where patterns emerged from the expert material that were not adequately represented by the initial theoretical categories. Finally, cross-case comparison was used to aggregate related codes into higher-order themes.

Five higher-order fragmentation dimensions emerged from this process: tool/system fragmentation, data/information fragmentation, methodological fragmentation, knowledge fragmentation and governance/decision-right fragmentation. Consequence codes were subsequently organized around coordination overload, information inconsistency, governance ambiguity, decision latency, rework and knowledge loss. Proposed solutions were grouped under information, technological, methodological, knowledge and governance integration.

A cross-case matrix was used to record whether each theme was substantively represented in each expert account. Theme frequencies therefore indicate recurrence across cases, not statistical prevalence in the wider population. No inferential statistical interpretation is attached to the reported counts.

Results and discussion

Project management fragmentation as an integration problem

The most important cross-case finding was that respondents did not define fragmentation simply by the presence of multiple tools, methodologies or organizational actors. Rather, fragmentation was associated with inadequate connections between these elements.

E7 provided the clearest illustration of this distinction by emphasizing that several project-management tools can coexist without creating significant difficulties when information moves reliably between them. Problems arise when data must be manually reconciled or when project actors cannot determine which source reflects the current project situation.

This finding supports the theoretical distinction between heterogeneity and fragmentation. Heterogeneity describes diversity within the project-management environment. Fragmentation describes the dysfunctional condition that emerges when this diversity creates integration demands that the available organizational mechanisms cannot adequately handle.

This interpretation is consistent with Organizational Information Processing Theory (Galbraith, 1974; Tushman and Nadler, 1978) and Coordination Theory (Malone and Crowston, 1994). It also refines the project-complexity perspective: differentiation and interdependence produce a need for integration, but the empirical findings indicate that the quality of integration itself deserves explicit analytical attention.

Five principal dimensions of PMF emerged from the expert evidence.

Tool and system fragmentation

Tool and system fragmentation was represented in 9 of 12 expert accounts. E1 described an environment in which Jira, Microsoft Teams, SharePoint, Excel and an internal financial system were used simultaneously. Different platforms could contain different representations of project status, requiring the project manager to spend substantial time reconciling information.

E11 identified a related inter-organizational manifestation. The outsourcing provider and client maintained separate systems, resulting in duplicate project representations and additional effort to transfer and transform reporting information.

These findings reinforce the broader digital-transformation argument that technology adoption creates value only when organizational processes and information structures are adequately integrated (Parviainen et al., 2017; Chen et al., 2025). They also correspond with recent systems-integration research identifying technical and process integration as important components of project-network performance (Lei, 2025).

The empirical evidence nevertheless suggests an important qualification: the number of systems should not be used as a proxy for fragmentation. Several specialized tools may be appropriate. Fragmentation arises where interoperability, system ownership and information-governance arrangements are insufficient.

Data and information fragmentation

Data and information fragmentation was the most frequently reported PMF dimension, occurring in 10 of 12 cases.

E5 described inconsistent KPI definitions and reporting formats across organizational units, including situations in which apparently identical indicators were calculated differently. E9 highlighted a related communication problem: project tasks and agreements could simultaneously appear in e-mail, collaboration tools, project systems and verbal communication, creating uncertainty over which representation should be treated as authoritative.

Information fragmentation therefore differs from conventional information overload. Eppler and Mengis (2004) focus primarily on excessive information-processing demands; the expert evidence in this study shows that substantial costs may also emerge from inconsistency and ambiguity between sources, even when the total information volume is not excessive.

Nine experts identified or implied the need for a single source of truth. However, the results indicate that this should be understood primarily as a governance principle rather than a demand for one universal application.

Different systems may remain authoritative for different data domains provided that ownership, synchronization and reporting rules are explicit.

Methodological fragmentation

Methodological fragmentation was identified in 7 of 12 expert accounts.

E2 described a consulting project in which the client required stage-gate governance, the consulting organization followed Agile principles and the delivery team used Scrum. These arrangements produced parallel management processes and separate governance artefacts.

E10 reported a similar pattern in insurance transformation projects. Delivery was iterative, while budgeting, risk management and formal approval processes remained predictive, resulting in planning and governance cycles operating at different speeds.

These findings are consistent with research demonstrating the widespread coexistence of Agile and predictive practices (Gemino et al., 2021; Marnewick and Marnewick, 2023) and with studies documenting implementation challenges within Agile-hybrid projects (Sithambaram et al., 2021). They also support the conclusion of Reiff and Schlegel (2022) and Székely et al. (2025) that organizational implementation of hybrid project management remains incompletely understood.

However, the expert evidence does not support the conclusion that hybrid approaches themselves are problematic. Instead, it reinforces more recent arguments for deliberate customization and integration of project-management methodologies (Mirzaei et al., 2025). Methodological fragmentation therefore appears to be primarily an interface-design problem: different methodologies create dysfunction when their planning cycles, responsibilities, reporting requirements and decision processes are not explicitly connected.

Knowledge fragmentation

Knowledge fragmentation appeared in 8 of 12 accounts.

E4 described project knowledge distributed across meeting notes, private documents, collaboration messages and individual employees' tacit knowledge. When team composition changed, contextual understanding and the rationale behind earlier decisions could be lost.

This finding corresponds with long-standing research on the difficulty of transferring learning from temporary projects into organizational memory (Disterer, 2002; Schindler and Eppler, 2003). More recent research similarly demonstrates that project-based organizations require active mechanisms for the acquisition, retention and retrieval of corporate memory (Barbosa et al., 2022).

The current evidence suggests that knowledge fragmentation should be distinguished from data fragmentation. Data fragmentation concerns incompatible or distributed formal representations. Knowledge fragmentation concerns the dispersion of contextual understanding, experiential expertise and decision rationale. These resources are particularly important in project-based organizations, where temporary organizational structures can interrupt continuity between people and projects (Turner and Müller, 2003; Prado and Sapsed, 2016).

Digital collaboration does not automatically solve this problem. Virtual project-team research demonstrates that communication technologies can support knowledge sharing but also require appropriate practices, guidelines and organizational conditions (Swart et al., 2022).

Governance and decision-right fragmentation

Governance and decision-right fragmentation was identified in 8 of 12 expert accounts.

E3 described overlapping decision rights among the project manager, product owner, IT management, risk function and steering committee. This overlap increased escalation and extended decision time.

E12 highlighted a related responsibility-authority mismatch. Project managers could be formally accountable for project outcomes while important decisions remained under the authority of functional managers.

The findings are consistent with project-governance research distinguishing governance structures from day-to-day project management and emphasizing the importance of clearly designed authority and accountability arrangements (Too and Weaver, 2014; Müller et al., 2016).

The additional contribution of the PMF perspective lies in treating governance ambiguity as interconnected with other forms of fragmentation. Decision ambiguity becomes more damaging when decision-makers simultaneously face inconsistent information, competing methodological processes or fragmented knowledge.

Coordination overload, decision latency and rework

The strongest cross-case consequence was increased coordination effort, reported in 11 of 12 expert accounts.

Reported forms of additional coordination included reconciliation of information between systems, duplication of reporting, additional meetings, clarification of responsibilities, translation of information between departments and synchronization between supplier and client environments.

This pattern directly supports the coordination-theoretic logic that performance depends on the mechanisms used to manage dependencies (Malone and Crowston, 1994). Fragmentation increases the effort required to manage those dependencies.

The findings therefore suggest that the principal relationship may not be a simple direct effect of fragmentation on project performance. Instead, PMF appears to generate coordination overload, which consumes managerial attention and project resources that could otherwise be devoted to delivery and adaptation.

Decision latency was reported in 8 cases and appeared to emerge through two closely related mechanisms. Information inconsistency requires actors to determine which data are trustworthy before making decisions, while governance ambiguity requires them to determine who has authority to decide. When both conditions occur simultaneously, escalation and reconsideration are more likely.

Rework was identified in 7 cases. It included repeated data entry, duplicated reporting, corrections caused by outdated information and decisions revisited because different stakeholders relied on different project representations.

The current qualitative evidence supports this sequence as a conceptual explanation, not as statistically demonstrated causality.

Dimensions and management responses

Table 2. Dimensions and manifestations of project management fragmentation

PMF dimension	Typical manifestations	Main mechanism	Potential consequence	Integration response
Tool/system fragmentation	Multiple disconnected platforms; parallel status representations; manual reconciliation	Coordination overload	Duplicated effort; inconsistent reporting; reduced transparency	System interoperability; explicit systems of record; automated data exchange
Data/information fragmentation	Competing project statuses; inconsistent KPIs; multiple communication channels	Information inconsistency	Decision delay; reduced confidence; rework	Authoritative information governance; common data definitions; single-source-of-truth principle
Methodological fragmentation	Parallel Agile, predictive and custom processes; different planning cadences	Coordination overload and governance ambiguity	Governance tension; duplicated reporting; role confusion	Explicit methodology interfaces; aligned governance cycles
Knowledge fragmentation	Knowledge dispersed across people, messages and documents	Knowledge discontinuity	Knowledge loss; repeated mistakes; weak organizational learning	Knowledge repositories; decision logs; transition and lessons-learned procedures
Governance/decision-right fragmentation	Overlapping authority; responsibility without authority; unclear functional boundaries	Governance ambiguity	Decision latency; escalation; reduced agility	Decision-right matrices; responsibility-authority alignment; explicit escalation mechanisms

Source: developed by the author based on expert survey findings and relevant literature (Baccarini, 1996; Too & Weaver, 2014; Gemino et al., 2021; Barbosa et al., 2022; Chen et al., 2025).

The cross-case recurrence of themes is summarized in Table 3.

Table 3. Cross-case thematic findings

Theme	Experts mentioning theme (n=12)
Tool/system fragmentation	9
Data and information fragmentation	10
Methodological fragmentation	7
Knowledge fragmentation	8
Governance/responsibility fragmentation	8
Increased coordination costs	11
Decision latency	8
Rework	7
Need for a single source of truth	9
Need for clearer governance	8
Integrated data/systems	9
Partial rather than full standardization	6

These frequencies should be interpreted as indicators of thematic recurrence rather than estimates of prevalence.

From beneficial heterogeneity to dysfunctional fragmentation

An important finding concerns the boundary between flexibility and fragmentation.

The respondents did not generally consider multiple tools, methodologies or decentralized arrangements inherently dysfunctional. E6 explicitly described the benefits of allowing project teams to choose tools and practices appropriate to their work. The problem emerged as such autonomy expanded without corresponding organization-level integration mechanisms.

This pattern suggests a flexibility paradox. Increasing autonomy can improve local adaptation while

simultaneously increasing organization-wide integration requirements. Once integration capacity becomes insufficient, the same diversity that previously supported flexibility begins to generate coordination costs.

Six respondents explicitly favored partial rather than complete standardization. This empirical pattern supports the principle labelled here as Minimum Viable Standardization.

Rather than prescribing one methodology or platform for all projects, the principle identifies a limited set of organizational interfaces that should remain common. These may include authoritative information sources, core data definitions, KPI logic, decision rights, escalation rules and minimum knowledge-retention requirements.

Project teams can retain greater autonomy concerning specialized delivery tools, team-level routines and context-specific working practices.

This interpretation is compatible with organizational ambidexterity, which emphasizes the need to maintain differentiation without losing organizational coherence (O'Reilly and Tushman, 2008), and with recent hybrid-project research emphasizing contextual configuration rather than one universal methodology (Mirzaei et al., 2025).

Project Integration Governance

The management responses proposed by respondents converge into what this study terms “Project Integration Governance”. Project Integration Governance is defined as: “*the coordinated set of information, technological, methodological, knowledge and decision-governance mechanisms through which an organization maintains coherence among heterogeneous project-management elements while preserving appropriate project-level flexibility*”. Five integration domains correspond to the five fragmentation dimensions.

1. Information integration establishes authoritative data ownership, common definitions, consistent KPIs and clear systems of record.

2. Technological integration addresses interoperability, automated data exchange and unnecessary duplication between digital platforms.
3. Methodological integration establishes explicit interfaces between Agile, predictive and organization-specific processes, including aligned reporting, planning and escalation cycles.
4. Knowledge integration creates mechanisms for retaining project rationale and experience through decision logs, knowledge repositories, lessons-learned processes and structured personnel transitions.

5. Governance integration aligns decision authority with accountability and establishes explicit boundaries among project managers, sponsors, steering committees, product roles and functional management.

These mechanisms can be interpreted through Organizational Information Processing Theory as ways of increasing integration capacity to meet growing information-processing requirements.

The proposed framework is presented in Fig. 1.

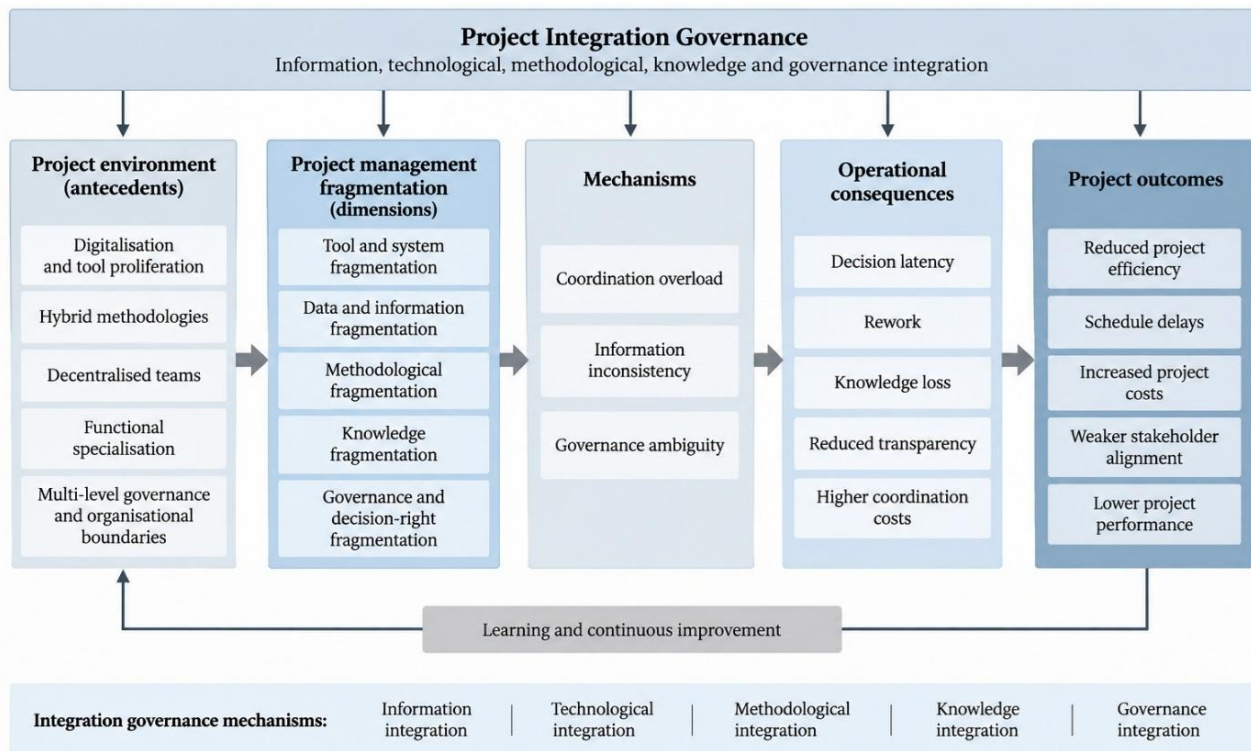


Fig. 1. Project management fragmentation and integration governance framework

The framework should not be interpreted as a statistically validated causal model. Rather, it synthesizes recurring expert patterns with established theoretical mechanisms and provides propositions for subsequent quantitative testing.

Managerial implications

The findings suggest that organizations should not treat fragmentation solely as an IT rationalization problem. Reducing the number of project-management applications may help, but consolidation alone will not resolve fragmented decision rights, incompatible methodologies or dispersed project knowledge.

A more comprehensive managerial response can be organized into five steps.

First, organizations should diagnose fragmentation across systems, information, methodologies, knowledge and governance rather than assess only software architecture.

Second, they should identify the interfaces where fragmentation generates the greatest coordination cost. These

may be data transfers between systems, handovers between Agile teams and steering committees, or decisions requiring repeated escalation.

Third, organizations should define minimum mandatory integration standards, including authoritative information sources, common data definitions and decision-right structures.

Fourth, critical interfaces should be strengthened through interoperability, aligned governance cycles, knowledge-retention practices and responsibility-authority alignment.

Finally, organizations should deliberately preserve local flexibility in domains where variation continues to generate project value.

Project Integration Governance therefore seeks integration without unnecessary uniformity.

Conclusions

The study provides evidence that project management fragmentation in contemporary digital and hybrid environments is best understood as an integration problem rather

than simply as technological proliferation or project complexity.

In response to RQ1, five recurring dimensions were identified: tool and system fragmentation (9 of 12 expert accounts), data and information fragmentation (10 of 12), methodological fragmentation (7 of 12), knowledge fragmentation (8 of 12), and governance and decision-right fragmentation (8 of 12). Their coexistence indicates that fragmentation extends beyond any single technological or organizational component.

In response to RQ2, the strongest recurring mechanism was increased coordination effort, reported in 11 of 12 expert accounts. Information inconsistency and governance ambiguity further contributed to decision latency, while repeated reconciliation and incompatible project representations generated rework. The findings therefore support an interpretive pathway in which fragmentation increases coordination and information-processing requirements before affecting project-level outcomes.

In response to RQ3, the study proposes Project Integration Governance as a cross-dimensional management response. Its five components: information, technological, methodological, knowledge and governance integration - they correspond to the five observed dimensions of fragmentation.

The principal theoretical contribution lies in distinguishing heterogeneity from fragmentation. Multiple methodologies, technologies and organizational actors may remain beneficial where adequate integration exists. Dysfunctional fragmentation emerges when integration capacity becomes insufficient relative to the heterogeneity that must be coordinated. The proposed integration-capacity boundary extends existing project-complexity, information-processing and hybrid-management perspectives by making the quality of interfaces between heterogeneous project-management elements the primary analytical focus.

The principle of Minimum Viable Standardization translates this argument into managerial practice. Rather than choosing between unrestricted decentralisation and comprehensive standardization, organizations should standardize those interfaces required for coherent project management while preserving variation that supports specialized work and local adaptation.

Limitations

The study has several limitations. The analytical sample is small and purposively focused on experienced professionals, with strong representation of service-sector organizations. The study captures managerial perceptions at one point in time and therefore cannot demonstrate causal relationships or the longitudinal development of fragmentation. Theme frequencies describe recurrence within the sample and should not be interpreted as estimates for a wider population. The conceptual framework consequently requires further empirical validation.

Future research should develop and validate a Project Management Fragmentation measurement instrument covering the five proposed dimensions. Larger quantitative studies could test the relationships between PMF, coordination overload, decision latency, rework and project performance using structural equation modelling. Longitudinal research could further investigate whether investment in Project Integration Governance reduces fragmentation as organizations mature. Finally, emerging AI-based project-management systems deserve particular attention because they may simultaneously improve cross-system information integration and introduce additional technologies, decision actors and accountability interfaces.

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Prof. Dr. Rasa Žilienė is a Professor at the Department of Management and Economics, Klaipėda University, Lithuania. Her research interests encompass project management, project governance, digital transformation, organizational integration, innovation management and sustainable organizational development. Her academic work is focused on understanding how organizations can strengthen coordination, integration and management effectiveness in complex, dynamic and increasingly digital environments. She has extensive experience in the development and implementation of national and international projects, including EU-funded research and innovation initiatives. This experience has contributed to her practical expertise in project planning, coordination, governance, stakeholder cooperation and the alignment of project objectives with broader organizational priorities. She has held project management and academic leadership positions, which have provided her with direct experience of managing complex activities, coordinating different actors and responsibilities, and supporting decision-making across organizational and institutional boundaries. Alongside project management, her research addresses broader management challenges related to organizational change, innovation, digitalization and sustainable development. Particular attention is given to the ways in which organizations design and improve governance arrangements, integrate information and knowledge, coordinate cross-functional activities and adapt management practices to changing technological and institutional conditions. Her work is therefore positioned at the intersection of project management, organizational management and innovation, with an emphasis on both theoretical development and practical applicability. A recurring theme in her research is the search for management approaches that help organizations remain coherent and effective without reducing the flexibility needed for innovation, adaptation and professional autonomy. She is interested in how digital transformation, hybrid management practices, distributed responsibilities and multiple organizational interfaces influence coordination, decision-making and performance. Her research also explores how governance and integration mechanisms can support knowledge sharing, organizational learning and more effective collaboration among stakeholders.

Her professional and academic experience allows her to approach management problems from both strategic and operational perspectives. By combining research on project governance, organizational integration, innovation and sustainable development with practical experience in project implementation and leadership, she contributes to the development of management solutions suited to complex and changing organizational environments. Her current academic interests also include the long-term development of organizational capabilities that support resilience, innovation and sustainable performance.

E-mail: rasa.ziliene@ku.lt. ORCID ID: 0000-0001-8339-2713.