

INTERPRETING AND OPERATIONALIZING ENTERPRISE AGILITY IN CONSTRUCTION: A SAFE-BASED CASE STUDY

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ABSTRACT

Despite its large economic scale, global construction productivity has stagnated over the past two decades, with fewer than 1% of mega-projects meeting cost, schedule, and benefit targets. These persistent performance challenges are a result of the high complexity, non-standard nature, and high multi-stakeholder coordination demand of construction projects, which strain rigid conventional management models. Enterprise agility has been widely adopted in other industries to address similar limitations in flexibility and coordination; however, there is a lack of empirically grounded interpretations of how agility transformation frameworks can be meaningfully adapted to the construction industry. This study examines how enterprise agility can be interpreted and operationalized within a construction organization. Using the Scaled Agile Framework for Enterprise (SAFe) as an analytical reference architecture, a qualitative case study is conducted of a large-scale general contractor in Taiwan, with analyses interpreted within the context of Lean Construction principles. An explicit competency mapping procedure is used to analyze observed lean-agile organizational practices against SAFe's five core competencies. The results show that enterprise agility in construction emerges selectively across SAFe competencies, manifesting most strongly in leadership enablement, cross-functional coordination, and pre-construction value planning, while portfolio-level agility remains fundamentally constrained by contractual and financial commitments.

KEYWORDS

Value stream, Transformation-Flow-Value, collaboration, agile transformation, lean construction.

INTRODUCTION

The construction industry is characterized by one-off project specifications, demands, and scales. In addition, a single large-scale project may involve thousands of personnel from diverse technical backgrounds, with some personnel remaining throughout the project's entire lifecycle while others participate only temporarily. The complex and dynamic on-site environment, combined with operational variations across projects, makes the effective management of personnel, equipment, and materials particularly challenging. Altogether, these challenges contribute to stagnation in construction productivity growth, increasing by only 1% over the past two decades despite the industry accounting for 13% of global GDP (Barbosa et al., 2017).

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It was also found that only 0.85% of 16,000 projects simultaneously met budget, schedule, and efficiency requirements (Flyvbjerg & Gardner, 2023). While these challenges have been attributed to a range of factors (e.g., contractual structures, labor dynamics, technological limitations), organizational coordination and management remain a critical area of investigation.

These findings suggest that conventional, rigid, and plan-driven management models may be insufficient to address the flexibility demands of contemporary construction projects, among other structural factors. In the Software and Information Technology industry, a promising solution is to develop the organization's agility, which is characterized by being flexible to market shifts and other external factors (Tilman & Jacoby, 2019). For construction organizations, agility presents a promising approach for addressing persistent challenges related to productivity, integration, and project performance. However, existing agile transformation frameworks are primarily developed for software and technology industries, which exhibit organizational characteristics fundamentally different from the construction sector. There remains a lack of empirical studies examining how agile principles can be adapted from project-level practices into enterprise-level capabilities within large-scale construction organizations.

To address this gap, this research examines how an established enterprise agility framework can be interpreted and operationalized within construction organizations. The study adopts the Scaled Agile Framework for Enterprise (SAFe) as an analytical reference architecture to structure the analysis of organizational agility in a construction context while grounding the findings in Lean Construction principles. A retrospective qualitative case study of a large general contractor in Taiwan undergoing agile-oriented organizational change is used to examine how SAFe's enterprise-level competencies can be translated into construction-specific organizational practices through systematic competency mapping. The main contribution of this study is an empirically grounded interpretation of enterprise agility in construction, demonstrated through a SAFe-based analytical case study of a large construction organization.

RELATED WORK

To highlight the structural gap between the increasing complexity of construction environments and the management paradigms used in governing them, the following relevant literature is reviewed. After establishing the structural rigidity of conventional plan-driven models, the emerging industry innovations that address flexibility in fragmented ways are discussed. Attention is then shifted from individual projects to the organizational level, where alignment, adaptability, and the integration of innovation remain unresolved. Finally, enterprise-wide agility approaches are examined to explore and address the systemic gaps in current literature.

CONVENTIONAL CONSTRUCTION MANAGEMENT MODELS

The construction industry generally relies on rigid, plan-driven management approaches where each lifecycle phase must be fully completed before it can proceed to the next. This waterfall logic is also reflected in on-site decision-making. Although these models provide clarity in contractual accountability and compliance, they are vulnerable to external factors and may fail in the event of non-conformity, which is a common occurrence in large-scale projects. As the scale and multi-stakeholder coordination requirements increase, rigid planning structures limit responsiveness at the operational level (Tilman & Jacoby, 2019).

Beckenbauer et al.'s (2023) global survey of over 2,500 business leaders found that only half believed their organizations were capable of effectively predicting and responding to external shocks, while one-third viewed their organizations as overly complex and inefficient. Conventional paradigms held in traditionally oriented construction organizations struggle to cope with uncertainty and increasing project complexity, resulting in the currently observed productivity stagnation (Barbosa et al., 2017; Flyvbjerg & Gardner, 2023). This outlines a need

to examine management models that support adaptability, flexibility, and continuous alignment across organizational layers in construction.

FUTURE TRENDS IN THE GLOBAL CONSTRUCTION INDUSTRY

Developments in Construction 4.0 show significant advances in data integration, digitalization, and automation. These include technologies such as Building Information Modeling (BIM), construction robotics, artificial intelligence (AI)-driven automation, construction management platforms, and Internet of Things (IoT), among others (Casini, 2021; Prasser, 2024). While these innovations address specific issues of project execution, they remain fragmented and do not address the broader challenge of organizational coordination. Despite the substantial technological advancement, productivity challenges persist, suggesting that the limitation lies in the absence of an integrated enterprise-level management approach capable of effectively integrating innovations and coherently aligning strategy, execution, and value delivery.

AGILE AND LEAN APPROACHES IN CONSTRUCTION

The Agile Manifesto (Beck et al., 2001) first formalized agile management as a response to uncertainty in product delivery. Traditional waterfall models suffer from assuming that product particulars can be fully specified upfront, often resulting in feedback gaps with owners, inter-organizational knowledge silos, and sunk cost fallacies (Larman, 2004). In contrast, agile philosophy focuses on human-centric, feedback-based, iterative delivery. Agile thinking has since evolved from team-level principles into enterprise-oriented frameworks such as the Agile Triangle (Highsmith, 2009), which emphasize value and quality delivery within organizations.

Although agile methods originated from the software industry, their principles have been explored within the construction domain. Mnqonywa et al.'s (2018) study shows that adopting agile methodologies in construction can improve delivery and operational performance. Agile-inspired practices such as short planning cycles, visual management, stand-up meetings, and Kanban systems have been implemented across construction activities at the project and activity level, including bidding, design coordination, and site management (Bertelsen & Koskela, 2004; Chen, 2022; Albuquerque et al., 2020). While these efforts highlight the benefits of agility in construction, applications remain fragmented and localized to project-level practices, with limited integration at the enterprise level. Recent reviews show that agility is mainly applied to localized practices (Huaricallo Vilca & Becerra León, 2024).

Lean Construction represents a domain-specific adaptation of lean principles to the unique production conditions of construction, focusing on workflow reliability, waste reduction, and value maximization across project-based delivery systems (Bertelsen & Koskela, 2004). Unlike general lean thinking, Lean Construction explicitly addresses project-level coordination through mechanisms such as the Last Planner System, pull-based planning, and collaborative production control. In construction contexts, lean and agile approaches exhibit strong conceptual alignment, particularly in their shared emphasis on value delivery, collaboration, transparency, and continuous improvement, although they are often applied at different organizational levels in construction contexts. Malla's (2024) study identified a transitive mutual relationship between lean and agile practices in the use of common project management tools, collaborative data platforms, and team-based training initiatives. Empirical studies comparing lean and agile project management approaches independently found that both can contribute positively to quality performance and client satisfaction (Badran & Abdallah, 2025).

While Lean Construction provides established mechanisms for improving project-level coordination, empirical evidence suggests it offers limited insight into how such practices can be scaled across organizational levels. Hamerski et al. (2019) combines Lean Construction's Last Planner System with the Scrum agile framework to enhance coordination in multi-project environments, but their work does not address enterprise-level implementation. This reveals a

gap in understanding how lean–agile principles can be embedded in organizational leadership, governance, and decision-making to sustain agility across construction enterprises.

ENTERPRISE AGILITY AND ITS ADAPTATION

Unlike project-level agile practices, enterprise-wide agile frameworks such as SAFe support coordination of agility across teams, programs, and portfolios in software organizations (International Agile Federation, 2024). SAFe offers a framework that links strategy, execution, and governance across roles through defined value streams and competency-based maturity models for enterprise-wide implementation (Knaster & Leffingwell, 2020). Despite extensive application in other domains, adaptation to construction organizations remains non-trivial.

Prior studies attribute large-scale agile transformation failure modes to leadership, cultural, and systemic misalignment (Nguyen et al. 2023; Karlsson, 2024), suggesting that direct rigid framework adoption is ineffective (Conboy & Carroll, 2019; Moe et al., 2020). Context-sensitive interpretations are therefore more practical as SAFe assumes stable teams, continuous digital product flows, and organizational boundaries that differ from the project-based, physically constrained, and dynamic structures of construction (Bertelsen & Koskela, 2004).

These differences limit the applicability of SAFe without reinterpretation, particularly in areas of team formation, value stream definition, and portfolio-level governance. Empirical examination of organizations exhibiting sustained agile-oriented practices is needed to understand how enterprise agility manifests in project-based industries such as construction.

To adapt enterprise-wide agile philosophy to construction, this study adopts SAFe as an analytical reference architecture, rather than a prescriptive implementation, to structure the analysis of organizational agility. Grounded in Lean Construction principles, the analysis interprets enterprise-level competencies as construction-specific organizational capabilities, conceptualizing agility as an evolving organizational competence.

METHODOLOGY

CASE SELECTION AND RESEARCH METHOD

This study adopts a qualitative, interpretive case study approach from an embedded perspective within a Class-A general contractor in Taiwan with over three decades of participation in local and international markets. Class-A contractors represent the highest licensing tier, authorized to undertake large-scale, complex projects. The firm employs over 1,000 personnel and reported revenues of US\$272 million in 2024 and US\$313.6 million in 2025, placing it among the top-performing contractors nationally. The organization is suitable for three main reasons: its scale and project complexity enable analysis of enterprise-level agility; its agile and lean initiatives provide rich empirical material; and its top-tier industry position enhances the relevance and transferability of findings. First-hand data were obtained through an embedded author with five years of experience overseeing more than 20 construction projects, complemented by internal observations and organizational documents. Practices were qualitatively mapped to SAFe's core competencies to identify alignment with enterprise agility principles.

CONTEXTUAL IMPLEMENTATION OF SAFe

SAFe is used as a conceptual reference framework for analyzing organizational capabilities associated with business agility. This study follows the 2025 updated SAFe framework, which conceptualizes business agility through five core competencies: (1) Leadership and Culture (L&C); (2) Team and Technical Agility (T&TA); (3) Product Development Flow (PDF); (4) Large Solution Integration and Delivery (LSID); and (5) Lean Portfolio Management (LPM).

The research question guiding this analysis can be formulated as: *How do the organizational practices of a construction organization develop agile core competencies that align with SAFe*

principles? In this context, alignment refers to how closely observed organizational practices correspond to the intent of SAFe's competency model and is assessed through a set of interpretive criteria derived from the functional intent of SAFe's core competencies. Specifically, practices are evaluated based on whether they exhibit key characteristics that are strongly associated with enterprise agility, including coordination across organization levels, feedback and learning mechanisms, and adaptability in planning and execution (Knaster & Leffingwell, 2020). Alignment is interpreted at the competency level by assessing whether the mapped set of practices collectively reflects the intent of each SAFe competency. The alignment levels act as interpretive guides and are expressed through qualitative descriptors.

- **Aligned:** The mapped set of practices collectively demonstrates multiple characteristics consistent with the intent of a SAFe competency.
- **Partially Aligned:** The mapped practices show some characteristics but lack consistency.

The procedure follows a competency mapping logic (Figure 1). Evidence is systematically compared against SAFe's five core competency disciplines. The procedure is as follows:

1. **Practice Identification:** Practices are identified from observations across varying operational levels, internal documents, and operational artifacts.
2. **Practice Aggregation:** To avoid redundancy, practices that are closely related or serve similar functions are consolidated through an expert informed aggregation process.
3. **Competency Mapping:** Aggregated practices are mapped to one or more SAFe competency disciplines based on their functional intent and role. (Figure 2)
4. **Interpretive Alignment Analysis:** The mapped results are analyzed to examine patterns of alignment or partial alignment across competency domains.

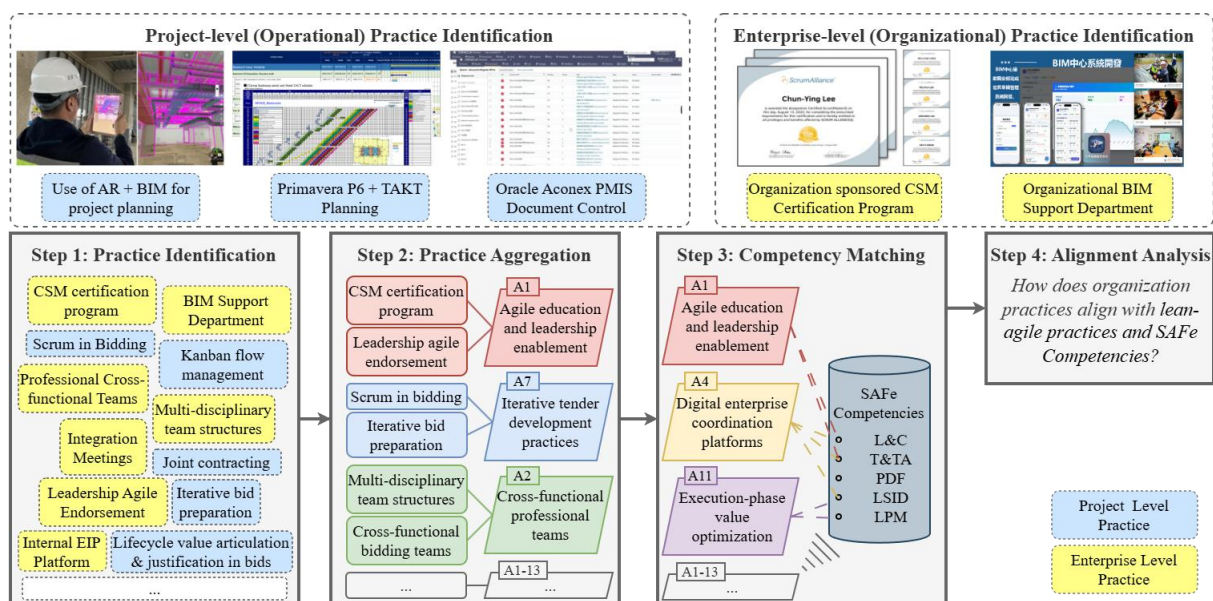


Figure 1: Flow diagram for aligning organizational practices to SAFe competencies.

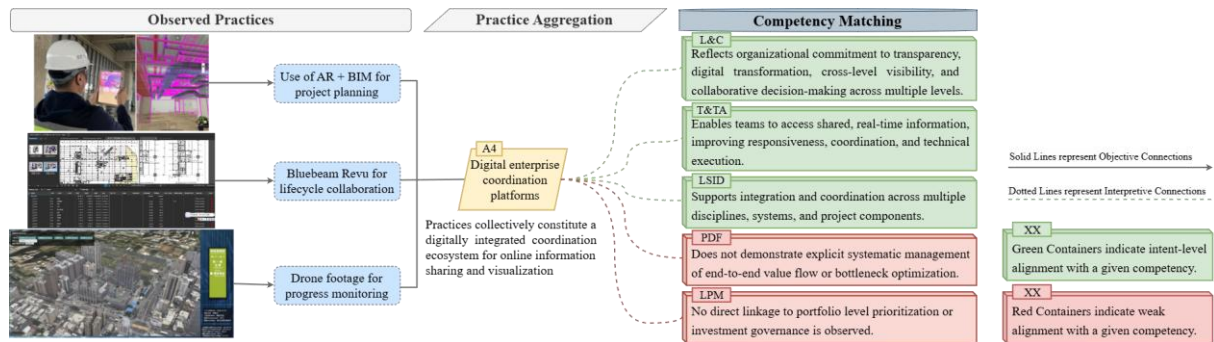


Figure 2: Sample Mapping Trace from Observed Practices to SAFe Competency Alignment

CASE STUDY

PRACTICE IDENTIFICATION AND AGGREGATION

Table 1 presents the resulting aggregated categories.

Table 1: Aggregation of 48 raw organizational practices into 13 distinct categories.

Raw Observed Practices	Aggregated Practice Category	ID
CSM certification program; agile education sponsorship; enterprise agile workshops; internal agile training programs; leadership endorsement of agile	Agile education and leadership enablement	A1
Cross-functional professional delivery teams; cross-functional bid teams; integrated multi-disciplinary teams	Cross-functional professional teams	A2
Kanban flow management; visual WIP control mechanisms; cross-department Kanban visibility; enterprise-wide work transparency	Visual coordination and transparency mechanisms	A3
Internal EIP platform; PMIS deployment; project war-room dashboards; enterprise information portals	Digital enterprise coordination platforms	A4
BIM implementation; ERP deployment; digital safety systems; enterprise and project-level system integration	Digital modeling and technical integration	A5
Primavera P6 scheduling; milestone control systems; schedule-driven execution tracking; centralized planning and control mechanisms	Schedule-driven execution control	A6
Scrum-based tendering; iterative bid preparation; sprint-based bid reviews; agile bid planning	Iterative tender development practices	A7
Lifecycle value articulation in bids; lifecycle cost narratives; value justification across project phases	Lifecycle-oriented value articulation	A8
Joint contracting structure; collaborative commercial frameworks; multi-party governance models	Joint contracting and integrated delivery	A9
Phased / layered construction strategies; tactical agile execution in delivery; adaptive field execution approaches	Tactical agile execution strategies	A10
Value engineering; execution-phase cost optimization; cash-flow management; financial performance control	Execution-phase value optimization	A11
Strategic investment awareness; capital constraint management; portfolio-level prioritization discussions	Strategic investment awareness	A12
Learning organization initiatives; cross-department knowledge sharing; continuous improvement mindset	Learning-oriented governance	A13

COMPETENCY MATCHING

The following analysis draws on both project-level and enterprise-level observations. Each aggregated practice category is mapped to one or more of SAFE's five core competency disciplines, recognizing that some practices span multiple competency domains. The mapping illustrated in Table 2 serves as a reference for subsequent alignment and interpretive analysis.

Table 2: Competency matching of case company's aggregated practices to 5 SAFe competencies

ID	Aggregated Practice Category	L&C	T&TA	PDF	LSID	LPM
A1	Agile education and leadership enablement	✓	✓			
A2	Cross-functional professional teams	✓	✓			
A3	Visual coordination and transparency mechanisms	✓	✓			
A4	Digital enterprise coordination platforms	✓	✓		✓	
A5	Digital modeling and technical integration		✓		✓	
A6	Schedule-driven execution control		✓		✓	
A7	Iterative tender development practices			✓		
A8	Lifecycle-oriented value articulation			✓		
A9	Joint contracting and integrated delivery				✓	
A10	Tactical agile execution strategies				✓	
A11	Execution-phase value optimization				✓	(✓)
A12	Strategic investment awareness					✓
A13	Learning-oriented governance	✓		✓		

INTERPRETIVE ALIGNMENT ANALYSIS

The following analysis is supported by representative observed practices from both project-level and organizational-level contexts.

Leadership and Culture Competency

L&C alignment in the case organization is most clearly evidenced through the formal introduction of agile coaching via Certified ScrumMaster (CSM) roles where CSM-certified personnel are assigned to facilitate cross-department coordination sessions and meetings across multiple concurrent projects. The organization represents one of the first documented instances within Taiwan's construction industry to systematically introduce agile coaches as part of an organization-wide transformation effort. This initiative reflects upper management's deliberate investment in developing professional, cross-functional teams (A1, A2). Agile coaches acted as facilitators of cross-departmental communication, learning, and reflection, supporting leadership enablement and trust as foundations for agility.

The organization also exhibits an explicit commitment to continuous learning and transparency. Structured learning initiatives, internal knowledge-sharing mechanisms, and cross-functional collaboration are increasingly institutionalized as ongoing organizational practices. These practices include transparency-oriented mechanisms such as enterprise dashboards, war-room displays, and cross-department Kanban systems that enhance visibility, shared understanding, and trust across enterprise layers (A3, A4, A13). Collectively, these practices demonstrate a **substantial intent-level alignment** with SAFe's L&C competency.

Team and Technical Agility Competency

Alignment with T&TA in the case organization is most clearly observed in the establishment of professional, cross-functional team structures and the application of flow-oriented coordination mechanisms. For instance, cross-functional teams operated within shared war-room environments where BIM models, scheduling data, and Kanban boards were jointly reviewed to resolve coordination issues in real time, supporting better-coordinated teams with a shared ownership of outcomes. This team composition design departs from the fragmented task-based allocation practice common in traditional construction organizations and aligns with SAFe's emphasis on stable, empowered teams in agile operations (A2). In parallel, flow-oriented coordination practices inspired by SAFe's Flow Accelerators are applied to reduce bottlenecks, improve work visibility, and enhance execution predictability through visual management, workload balancing, and iterative coordination mechanisms (A3, A6).

In addition, the organization has invested in enterprise-level digital systems (e.g., BIM, PMIS, Primavera P6, other scheduling and safety tools), which function as infrastructural enablers supporting real-time information sharing and coordination across teams (A5, A6). These technologies enhance team autonomy, situational awareness, and decision-making capacity, as opposed to serving as agility drivers in isolation. These practices collectively reflect **strong intent-level alignment** with SAFe's T&TA competency at execution and coordination levels, emphasizing end-to-end flow over localized efficiency, reflecting a context-adapted form of agility suited to large-scale construction organizations.

Product Development Flow Competency

Alignment with the PDF competency is most clearly demonstrated in the organization's treatment of competitive bidding and pre-construction activities as iterative value-creation processes rather than traditional linear administrative tasks. For example, bid preparation was structured into iterative review cycles in which technical proposals, cost estimates, and risk considerations were incrementally refined prior to submission, reflecting the organization's explicit reframing of bidding as a value delivery flow encompassing bid acquisition, preparation, submission, and contract award stages. Specifically, Scrum-agile principles underpin key aspects of bidding processes, with cross-functional bid teams working in iterative planning cycles, frequent reviews, and continuous integration of inputs, facilitating rapid feedback and adaptive decision-making among stakeholders (A7).

The case organization further strengthens this alignment by developing bid narratives that address constructability, operational performance, and lifecycle value early in the process. Early value articulation and cross-functional coordination can shift efforts toward continuous refinement of value propositions rather than mere document completion, **aligning closely** with SAFe's emphasis on managing flow from concept to delivery and prioritizing value shaping.

Large Solution Integration and Delivery Competency

Alignment with the LSID competency is demonstrated through the organization's approach to managing complex, multi-stakeholder projects via integrated delivery structures and tactical execution strategies. A key aggregated practice underpinning this competency is the use of joint contracting and collaborative delivery arrangements, enabling coordination across organizational and contractual boundaries (A9). These arrangements are complemented by deliberate execution strategies, such as phased, zoned, and layered construction approaches that allow work to be decomposed and sequenced in response to site conditions, risk profiles, and interface constraints (A10). Together, these practices are intended to support solution-level coordination rather than isolated project control.

Another key practice reinforcing LSID alignment is the organization's management of value streams across engineering, execution, and cost control during delivery. Value engineering

activities, milestone-based coordination, and execution-phase optimization are used to integrate technical solutions with delivery constraints, ensuring that large-scale solutions remain coherent as conditions evolve (A11). There is substantial evidence of adaptive integration of tools and strategies for delivery, indicating **strong alignment** with the LSID competency.

Lean Portfolio Management Competency

Alignment with the LPM competency is comparatively limited and primarily expressed at the level of strategic awareness rather than through formalized portfolio governance mechanisms. The case organization shows an explicit recognition of capital constraints, market positioning, and long-term investment considerations when making strategic decisions, particularly in relation to large-scale project selection and resource allocation (A12). While the organization exhibits sensitivity to industry trends and operation-level strategic risk (limited A11), these considerations appear to remain largely implicit and experience-driven rather than structured through lean portfolio processes.

However, direct observation of portfolio-level decision-making processes is inherently limited, as such activities are typically conducted at the board or executive level and involve confidential strategic deliberations. As a result, there is a lack of evidence of systematic portfolio prioritization, value-based investment governance, or continuous portfolio-level flow management. As such, alignment with the LPM competency is best characterized as **weak to emerging**, constrained by the project-based financial structures and contract-driven decision logic typical of the construction industry. This limited alignment highlights a structural boundary for enterprise agility in construction, where strategic intent exists but formal portfolio-level agility remains underdeveloped.

DISCUSSION

The case study shows that competencies relevant to leadership enablement, team-level coordination, and smoother execution flow translate more readily into construction contexts, while those concerned with portfolio-level governance show comparatively weaker alignment. The L&C, T&TA, LSID, and PDF competencies align strongly because their core principles address challenges that are already salient in construction organizations. As such, SAFe-aligned practices that enhance shared understanding, reduce coordination friction, and support adaptive decision-making resonate with existing operational needs.

In contrast, competencies that assume stable organizational boundaries, continuous product value streams, and centralized investment governance translate less directly. LPM emerges as the weakest-aligned competency due to this mismatch with construction's operating conditions. Unlike software portfolios, construction portfolios cannot be continuously reprioritized once contractual commitments are made. This reflects a structural boundary for enterprise agility in construction, where adaptability is constrained by contractual irreversibility and capital rigidity rather than by managerial intent. As a result, LPM manifests as a strategic sensibility instead of a process-driven capability, indicating that while organizational practices can support coordination and execution-level agility, they have limited influence on enterprise-level investment governance.

Several structural constraints further limit enterprise agility. First, temporary project organizations reduce the stability of teams and value streams assumed by agile frameworks. Second, regulatory and contractual requirements prioritize compliance and risk allocation over flexibility. Third, physical production constraints impose sequencing dependencies that restrict iteration compared to digital environments. These constraints redirect agility toward specific organizational layers. For instance, agility in construction tends to concentrate in pre-construction coordination, execution tactics, and cross-functional integration. Enterprise agility

therefore manifests as an organization's ability to align strategy, coordination, and execution across projects instead of focusing on a single continuous value stream from an isolated project.

While this study focuses on enterprise agility, alternative explanations for persistent productivity challenges in construction must also be acknowledged. Contractual fragmentation, technological adoption limitations, and skilled labor constraints remain significant influences on performance. Lean Construction approaches such as the Last Planner System have demonstrated improvements in workflow reliability and coordination at the project level, while Integrated Project Delivery (IPD) addresses alignment through contractual restructuring. These perspectives suggest that organizational agility alone is insufficient and must operate together with contractual and operational mechanisms to achieve broader performance improvements.

Altogether, enterprise agility in construction should be understood as a capability of alignment rather than acceleration. Agile frameworks such as SAFe provide a useful interpretive lens when applied as conceptual architectures. Meaningful agile transformation in construction requires acknowledging where agility can be productively developed and where structural constraints necessitate alternative forms of coordination and control.

CONCLUSION

This study examined how enterprise agility frameworks can be interpreted within a construction organization by adopting SAFe as an analytical reference architecture. Grounded in Lean Construction principles, a qualitative case study of a Class-A general contractor in Taiwan was used to analyze how organizational practices align with SAFe's five core competencies.

Interpretive results indicate that enterprise agility in construction develops selectively rather than uniformly. Strong alignment is observed in competencies related to leadership enablement (L&C), cross-functional coordination (T&TA), and pre-construction value planning (PDF and LSID), particularly where organizations invest in digital coordination platforms and learning-oriented governance. Practically, investment in cross-functional coordination mechanisms supported by digital platforms can significantly enhance organizational agility in combination with iterative and feedback-driven practices in pre-construction stages.

In contrast, alignment with LPM remains limited due to structural constraints characteristic of the construction industry, such as project-based financial commitments, contractual irreversibility, and capital rigidity. These findings suggest that enterprise agility is feasible at the coordination and execution levels but remains constrained at the portfolio governance level.

This study contributes to Lean Construction research by extending its focus from project-level practices towards an empirically grounded understanding of enterprise-level agility in a construction organization through qualitative interpretation. Since the main analytical method is limited to qualitative interpretation without quantitative validation, future work may extend towards developing surveys, interviews, or assessments to better examine the feasibility of SAFe-aligned agility in multiple construction organizations. As agile frameworks evolve, future research can refine construction-specific indicators to support more systematic assessment of agile transformation in the industry.

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