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INTEGRATION OF THE LEAN THINKING PRINCIPLES INTO THE OWNERS' PROJECT MANAGEMENT

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ABSTRACT

Construction projects face expanding requirements, while project performance remains a persistent concern. This paper examines how Lean Thinking can be integrated into project owners' project management. Using the five Lean Thinking principles proposed by Womack and Jones as an analytical lens, the study draws on an iterative series of five focus-group workshops involving eight experts and the two authors. The workshop results were synthesised through structured memos, written feedback loops, and a final group review of the consolidated results. The findings suggest that many owner organisations and owner representatives already apply routines consistent with Lean Thinking, although often implicitly and in fragmented form. At the same time, the workshops identified principle-based action options for a more systematic integration. These suggest that Lean Project Management at the owner level differs from conventional approaches not by adding (isolated) methods, but by placing stronger emphasis on proactively shaping the conditions for reliable, value-oriented, and continuously improving project delivery. The paper thus provides an initial principle-based orientation for project owners and seeks to stimulate further discussion on Lean project management.

KEYWORDS

Lean project management, lean project delivery, project owner, client, lean principles.

INTRODUCTION

Construction projects are facing an expanding set of requirements. Beyond the conventional performance objectives of meeting time, cost, and quality targets, project owners (also often referred to as "clients" in the literature) are placing growing emphasis, among other things, on sustainability, digitalisation, user orientation, and life cycle and operations perspectives (e.g., World Economic Forum, 2016, 2024; Meisels et al., 2023; Barbosa et al., 2017).

Concurrently, project performance in many construction projects remains a persistent concern (Barbosa et al., 2017; Flyvbjerg et al., 2002). Depending on their severity, such problems may entail consequences that go far beyond moderate inefficiencies, including project termination or abandonment, severe financial hardship among participants, and lengthy disputes (Tariq and Gardezi, 2023; Ansah, 2011). Moreover, these situations can also contribute to reputational damage and adverse mental and physical health consequences for individuals involved (Lan et al., 2025; Gómez-Salgado et al., 2023).

Practical observations and prior research suggest that underperformance is often rooted less in a lack of technical expertise than in structural and socio-organisational aspects: unclear

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objectives, communication barriers, weak coordination, fragmented inter-organisational arrangements, shortcomings in leadership and decision-making, and dysfunctional project cultures (Whelton and Ballard, 2002; Bertelsen and Koskela, 2003; Rehan et al., 2024).

These aspects concern governance and steering domains (commonly subsumed under "project management") for which project owners bear substantial responsibility. Moreover, project owners typically hold the greatest, and sometimes the only, leverage to improve the organisational conditions under which project delivery unfolds (Giambona and Dacre, 2025; Winch and Leiringer, 2016; Morris, 2013). In practice, however, project owners' project management is frequently characterised by contract-centred, hierarchical, and comparatively rigid steering logics, complemented by predominantly retrospective variance-detection and control routines. Consequently, such approaches are widely viewed as misaligned with contemporary project dynamics, which has led to some calls for a reform of owner-side project management (Alarcón et al., 2013; Howell and Koskela, 2000; Koskela and Howell, 2001).

In German practice, project owners' project management is frequently not performed solely by the owner's organisation. They typically do not maintain the necessary delivery competencies or the manpower required for construction projects, as many organisations build only infrequently (if at all) and typically focus on non-construction core businesses. Consequently, responsibility for project owners' project management is often (partly) delegated to external owner representatives. These representatives are specialised service providers who support project owners in an advisory capacity or, depending on the contractual arrangement, assume delegated representative functions and responsibilities (John and Haghsheno, 2025).

To address these challenges, research has often discussed integrating the Lean approach into owner-side project management (e.g., Bertelsen, 2002; Howell and Macomber, 2006; Hatoum et al., 2018). Lean has demonstrated its potential to improve project delivery in construction, building on well-documented performance gains across industries (Abreu-Ledón et al., 2018; Hardcopf et al., 2021; Babalola et al., 2019).

However, the application of Lean Construction, both in research and in practice, has so far focused predominantly on the execution phase (and the design phase), yet largely from the perspective of project participants (i.e., designers and contractors). By contrast, the systematic translation to the project owner level remains less consolidated and is often limited to isolated method application. This gap is critical because owners, as initiators, decision-makers, and financiers, not only exert substantial influence over the conditions for success, but also shape whether Lean Construction is applied comprehensively and continuously across the project – enabling the approach to realise its full potential (John et al., 2026; Daoud et al., 2019).

To make Lean Construction more accessible for project owners, this paper examines how Lean Thinking can be integrated into project owners' project management. Using the five Lean Thinking principles proposed by Womack and Jones (2013) as an analytical lens, the study draws on a series of focus-group workshops to explore (1) the extent to which these principles are already reflected in current practice and (2) which further action options can be derived from these principles to enable more Lean Thinking by project owners and their representatives.

The paper contributes in two ways. First, it extends the discussion on applying Lean Construction in projects by adding an owner-driven, overarching governance perspective and providing an initial account of how Lean Thinking may be integrated at that level. Second, it derives action options that support translating Lean Thinking principles into concrete steering routines without reducing Lean Construction to *Lean light application*.

LEAN IN PROJECT OWNERS' PROJECT MANAGEMENT

From the outset of the Lean Construction discourse, the project-owner perspective has been part of the debate. In the IGLC context, early contributions introduced Lean Project Management as an integration of Lean Production and project management and argued that this

could improve project performance and user satisfaction (Horman and Kenley, 1996). Related work soon highlighted systemic shortcomings of conventional project management and called for a reform of project management grounded in Lean Thinking (Howell and Ballard, 1996; Howell and Koskela, 2000; Koskela and Howell, 2001, 2002; Bertelsen and Koskela, 2002). In parallel, Ballard (2000a; see also 2008) introduced the Lean Project Delivery System, later equated[3] with the "Lean Project Management" notion by Ballard and Howell (2003). Adopting a project-level perspective, they proposed a Lean-oriented phase logic that maps the approach across the full project life cycle.

In subsequent years, a substantial body of work built on these foundations and examined Lean Construction at the project level and from the project-owner perspective. Studies extended beyond organisational arrangements to address project culture (Zuo and Zillante, 2005), explored how Lean Thinking may improve owner-participant relationships (Palacios et al., 2011; Ørke et al., 2024), elaborated Lean Project Delivery and related governance arrangements (Alarcón et al., 2013; Grande et al., 2025), and advanced conceptualisations of owner value and success measures (Drevland and Klakegg, 2017; Umstot et al., 2014). Other contributions discussed capability requirements, including desired characteristics of project managers in Lean Project Delivery settings (Nishizaki and Seed, 2015), Lean competencies required by owners to enable Lean Construction (Daoud et al., 2019), the adoption in owner organisations (Dlouhy et al., 2017), and approaches to assuring end-user satisfaction (Hatoum et al., 2018). From around 2010 onwards, research increasingly engaged with collaborative project delivery models such as Integrated Project Delivery and partnering/alliancing, typically adopting a project-level view and often centring the owner perspective (Engebø et al., 2019; Ferstad et al., 2023; Fischer et al., 2014; Knapp et al., 2014; Seed, 2014; Haugseth et al., 2014; Young et al., 2017).

While the literature shows that owner-side project management is discussed, it still lacks concrete and practice-accessible accounts of how Lean Thinking can be embedded holistically in project owners' project management and carried into projects. By contrast, such guidance is more developed for other project participants. This paper seeks to help address this gap by offering an initial principle-based[4] orientation for project owners. It does not claim to close the gap, but rather to provide a first contribution that stimulates further discussion.

METHODOLOGY

This study employed an iterative series of focus-group workshops, drawing on established methodological guidance for focus-group research (Krueger, 2002), to examine how Lean Thinking principles can be integrated into owner-side project management in the German construction context. The overall design combined facilitated group discussions with an iterative validation step in which synthesised results were returned to participants for verification ("member checking"; Birt et al., 2016).

The focus-group panel comprised ten participants: eight experts and the two authors. The eight experts were selected purposively to ensure (a) substantial experience in construction (between 13 and 38 years), (b) practical and/or academic familiarity with Lean Construction,

[3] While this conceptual equivalence is plausible at an overarching level, the two notions should be distinguished. (Lean) project delivery refers to the overall mode through which a project is delivered and is commonly described across three interrelated domains: project organisation, contractual arrangements, and the operational (production) system (Darrington et al., 2009). (Lean) project management, by contrast, refers to the owner's management activity in the project, i.e. how the project owner and/or owner representative makes decisions and performs steering and governance tasks. Their relationship can be summarised as follows: Lean Project Delivery provides the project's structural frame, which is defined and maintained through Lean project management and, in turn, enables project management to manage the project in a Lean manner (John, 2024).

[4] Here, principle-based project management refers to orienting owner-side project management around the five Lean Thinking principles rather than around isolated Lean methods or tools (see also Shepherd et al., 2023).

and (c) a balanced representation of three perspectives: project owners (n = 3), external owner representatives (n = 4), and research (n = 1, plus the two authors).

The study consisted of five sessions, each lasting two hours. Each session addressed one of the five Lean Thinking principles and was structured around two guiding questions:

1. *To what extent are elements of the focal Lean Thinking principle already reflected in current owner-side project management practice in Germany?* This question draws on the conformity perspective advanced by Diekmann et al. (2003), which suggests that many organisations already employ principles and practices corresponding to core ideas of Lean Construction, even if they are not explicitly labelled as such.
2. *How could the focal Lean Thinking principle be implemented more systematically in owner-side project management?* This question aimed at deriving actionable options.

To ensure a shared baseline across sessions, the first author opened each workshop with a briefing that (i) introduced the Lean Thinking principle and (ii) translated it into the construction and project-delivery context. Data were generated in the subsequent group discussion, which was moderated by another facilitator. During the session, the moderator documented key statements and emerging points visibly for the group, allowing the discussion to iteratively refine areas of shared understanding. In parallel, the first author took additional written notes.

After each session, the visibly documented outputs and the first author's notes were compared and consolidated into a structured synthesis memo. The analysis proceeded as an iterative qualitative synthesis, organised deductively around the five Lean Thinking principles and the study's two guiding questions. Each memo captured the documented discussion results and emerging shared understanding, and served as the basis for the ongoing synthesis. The memos were circulated to all experts for review and correction, and the feedback received was incorporated. In addition, a final feedback round was conducted at the end of the study, during which all experts reviewed the consolidated results in full.

Several limitations should nevertheless be acknowledged. First, interactive group formats can be susceptible to dominance effects and socially desirable responding (Hsu and Sandford, 2007). A further limitation concerns the dual role of the first author, who contributed both to the preparation and synthesis of the workshops and (together with the second author) to the discussions themselves. These factors may have influenced participation dynamics, the framing of the discussions, and the interpretation of the results. To mitigate these risks, the discussions followed a structured format, were moderated by another facilitator, documented key points visibly for the group, and incorporated a written feedback loop in which synthesis memos were returned to all participants for review and correction. Second, the study does not aim to produce generalisable claims. Given the small expert panel and the German context of the study, it offers a structured and transparent synthesis of expert knowledge intended to inform subsequent empirical research and practice-based experimentation.

RESULTS

FOCUSING ON CUSTOMER VALUE (LEAN THINKING PRINCIPLE 1)

The first principle provides the orienting logic for Lean Thinking application because it specifies what should be optimised before attention turns to how to optimise it (Womack and Jones, 2013). Workshop participants stressed that value can only guide action when it is explicitly defined and translated into decision-relevant criteria.

In construction, this requires addressing multiple "customers": the *use customer* (end user), the *assignment/contract customer* (project owner/client), and *process customers* (downstream actors depending on upstream outputs) (see also Drevland, 2019). Because project owners are often not the direct end users, they must translate user needs into project objectives, requirements, and governance routines. Value was described as multi-dimensional (e.g.,

functionality, operational performance, adaptability, sustainability, and experience quality), while cost and time were framed primarily as constraints relative to the intended user value.

The key implication is a shift in owner-side project management from predominantly controlling cost and schedule to deliberately shaping a value-based governance system. The workshop synthesis indicates eight task fields:

1. Where an owner representative is involved, advise and sensitise the project owner on the implications of value-driven delivery and the benefits of user-value orientation.
2. Identify relevant customer perspectives (use, assignment/contract, and process customers; plus key stakeholder groups) and make their roles and priorities explicit.
3. Elicit and specify needs systematically (beyond requirements collection), including challenging assumptions and structuring needs assessment.
4. Translate needs into goals and criteria by converting the value proposition into stable objectives, requirements, and evaluation criteria usable throughout the project.
5. Manage goal and interest conflicts transparently under a "best for project" logic anchored in the value proposition.
6. Align the project organisation for value creation by shaping collaboration structures and steering processes to consistently deliver the defined customer value.
7. Ensure a shared understanding of value by aligning all participants on what constitutes project value and how their work contributes to it.
8. Institutionalise continuous value review by establishing routines that integrate new insights over long project durations to maintain or enhance project value.

While the workshops did not indicate a single "signature method," participants noted that value focus can be reinforced through a small set of practices, without reducing Lean Construction to method application. These included structured requirements planning approaches used in the German context (e.g., DIN 18205), stakeholder analysis, and multi-criteria decision procedures. For early-phase sensemaking, participants also referred to personas and use scenarios as pragmatic means of communicating user value across disciplines. In addition, they highlighted the conceptual relevance of the Last Planner System, whose internal-customer logic helps make handover requirements between process steps more explicit (Ballard, 2000b).

IDENTIFYING THE VALUE STREAM (LEAN THINKING PRINCIPLE 2)

This principle shifts attention from defining value to understanding how value is produced across the delivery system. The value stream comprises the activities required to translate an initial need into a deliverable that can be used by the customer. Value stream thinking makes visible where time, effort, and resources are consumed without contributing to customer value (i.e., waste) (Womack and Jones, 2013). Workshop participants highlighted that transparency about the actual sequence of work, information, and decisions is a precondition for systematic improvement, because only visible processes can be challenged, simplified, and stabilised.

In construction, identifying the value stream is more demanding than in repetitive production contexts due to temporary multi-actor organisations, heterogeneous scope definitions, and numerous interfaces across phases. Participants therefore stressed that value stream analysis must extend beyond physical site activities to include upstream and "invisible" flows such as needs definition, design and approvals, decision preparation, information handovers, and coordination cycles. Workshop experience further suggested that major delays and rework often stem less from execution productivity than from poorly designed information and decision processes, unclear responsibilities, and unstable handovers between phases.

The key implication for owner-side project management is a shift from optimising individual work, planning, and decision packages to shaping a coherent end-to-end delivery system that reduces waste throughout the project. The synthesis indicates five task fields:

1. Develop an overall process map early to model key phases, interfaces, and handovers from an end-customer perspective and make dependencies and friction points visible.
2. Identify and reduce non-value-adding activities by analysing recurring sources of waste (e.g., waiting for approvals, unclear decision ownership, redundant reviews, and coordination loops) and mitigating them through process and organisational measures.
3. Design interfaces and handovers deliberately by clarifying responsibilities and defining expected deliverables, information completeness, and timing across planning, execution, user representation, and other stakeholders.
4. Integrate operations and use-phase requirements by anticipating life cycle considerations (e.g., operating cost, maintainability, usability) and embedding them into planning and decision processes rather than treating them as downstream concerns.
5. Foster a collaborative steering logic by initiating transparent, cooperative planning and decision routines that counter silo optimisation and enable joint, end-to-end improvement of the value stream.

These tasks can also be supported by practices such as value stream mapping, cross-functional process maps (e.g., swimlane representations) to create a shared baseline, collaborative "brown paper" workshops to surface informal routines, structured phase-start workshops to align milestones, and planning approaches such as the Last Planner System to strengthen handovers.

ESTABLISHING FLOW (LEAN THINKING PRINCIPLE 3)

The third principle focuses on organising the value-creating sequence so that work progresses in a steady and stable manner with minimal interruptions, waiting, and avoidable feedback loops. Building on the definition of value and the identification of value-adding/non-value-adding steps, this principle addresses the organisational conditions that allow value to be produced continuously rather than in stop-and-go (Womack and Jones, 2013). Flow is therefore often framed as an indicator of system health: whenever flow breaks down, waste typically manifests as waiting, replanning, multiprocessing, inefficient resource utilisation, and increased risk of defects and claims.

In construction, achieving flow is particularly challenging due to project-specific configurations, temporary multi-actor organisations, and numerous interfaces across phases. A flow-oriented project is characterised by clear preconditions for downstream work, reliable handovers, and a cadence that reduces overload-idle cycles and stabilises coordination.

For owner-side project management, creating flow implies an expanded role from monitoring deliverables to actively shaping the conditions for a continuous, interruption-minimised project trajectory. The discussion synthesis indicates five task fields:

1. Structure the overall sequence early and across phases by establishing process logic that secures technical, organisational, and scheduling continuity and prevents breaks in flow.
2. Support takt-based planning by enabling takt logics and building a shared understanding of the value of continuous, synchronised processes across the project organisation.
3. Identify potential flow interruptions early by systematically anticipating disruptions and preparing preventive measures to avoid waiting, rework, and ad hoc replanning.
4. Design clear handovers and interfaces by defining responsibilities, decision routes, and acceptance criteria, treating handovers as prepared processes rather than one-off events.

5. Embed a flow-oriented project culture by anchoring continuous flow not only methodologically but also culturally, reinforcing transparency, commitment reliability, and cooperative collaboration as conditions for stable processes.

Participants linked these task fields to reinforcing practices such as the Last Planner System, takt planning/control, constraint management, visual monitoring, and standardised handovers.

ESTABLISHING PULL (LEAN THINKING PRINCIPLE 4)

This principle replaces plan-driven "push" control with a demand-driven logic: work is initiated only when a downstream customer (or process step) actually needs the output and is ready to receive and use it. Rather than "pushing" tasks into the system because a schedule prescribes them, pull aligns the start of work with real demand, capacity, and readiness. Premature work is therefore a structural source of waste, as early deliverables often create queues, re-handling, outdated intermediate results, and avoidable coordination – especially when upstream assumptions change. Pull thereby complements flow (principle 3) by governing not only how work progresses but also when it should be triggered to avoid congestion and stop-and-go dynamics (Womack and Jones, 2013).

Implementing pull in construction projects is both highly relevant and difficult because multiple parallel streams and tight interdependencies make "readiness" situational rather than purely plan-based. Participants described typical push symptoms: design packages produced "to plan" but not usable downstream, work started despite missing prerequisites, and materials delivered before the site is ready. A pull-oriented approach requires explicit alignment on inputs/outputs across interfaces and a shared understanding of what constitutes "ready" before work is released. Thereby, this logic applies not only to production tasks but also to information and decisions. For decision-making, however, pull is more demanding, because the appropriate timing of a decision depends on uncertainty, the reversibility of the issue, the quality of available information, and the potential downstream consequences. Pull in decision-making therefore requires avoiding both premature decisions based on unstable assumptions and delayed decisions that obstruct downstream progress.

For owner-side project management, pull implies enabling demand-driven triggering mechanisms and embedding them structurally into project governance. The discussion synthesis suggests six task fields:

1. Ensure demand-based triggering of activities by clarifying which outputs, information, or decisions are needed by whom and when, so work starts only when downstream use is feasible.
2. Define clear prerequisites and "ready" criteria by specifying and communicating verifiable conditions for starting work (e.g., approvals, information completeness, prerequisite work, material availability, clarified interfaces).
3. Establish pull points and release logics by creating explicit checkpoints where demand and readiness are confirmed.
4. Actively prevent premature or non-needed work by resisting early starts on packages whose results cannot yet be consumed, including technical work, planning outputs, information provision, and decision preparation.
5. Synchronise decisions with demand and flow by timing owner decisions to support downstream progress, avoiding premature decisions based on unstable assumptions and delayed decisions that create waiting and obstruct downstream work.
6. Embed pull-oriented communication and coordination formats by moderating short-cycle alignment routines, such as look-ahead meetings, readiness checks, and interface coordination formats, that enable timely requests, commitments, and information pull across disciplines and organisations.

The group linked these task fields to supporting practices such as look-ahead and make-ready planning, explicit interface agreements, visual pull signals, and decision-readiness logics to stabilise demand-based releases and reduce variability in both information and production flows.

PURSUING PERFECTION (LEAN THINKING PRINCIPLE 5)

The fifth principle frames Lean Construction as a deliberately designed learning system for continuous improvement. "Perfection" is not treated as a reachable end state. It denotes the ongoing pursuit of less waste, higher reliability, improved quality from the customer perspective, and more stable processes. This principle provides the meta-logic that strengthens the implementation of the preceding principles over time: deviations, disruptions, and errors are approached as learning signals, and improvement focuses on root causes rather than short-term symptom correction. In this view, quality is built into processes early and continuously, not primarily assured through downstream inspection and rework (Womack and Jones, 2013).

In construction, striving for perfection is particularly challenging because project organisations are temporary and dissolve after completion, risking systematic loss of experience. Participants therefore stressed the need for deliberate knowledge capture and transfer within and across projects, for example at phase transitions. They also highlighted the tension between project-specific conditions and standardisation: while projects differ in configuration and context, many recurring coordination and interface processes still allow learning and "best current ways of working" to be standardised and adapted rather than copied rigidly. Given the industry's fragmentation, improvement must extend beyond technical workflows to include handovers, communication, decision routines, and collaborative behaviour.

For owner-side project management, the discussion indicated that striving for perfection is closely associated with enabling continuous learning as a deliberate element of project governance and culture. The synthesis indicates five core task fields:

1. Embed a culture of striving for perfection by fostering psychological safety and an open learning stance, where issues can be named early, analysed transparently, and addressed without blame – so improvement proposals are encouraged and owned.
2. Establish structures for learning and continuous improvement by creating regular reflection, feedback, and lessons-learned formats throughout delivery (not only at project end), with the project management initiating and moderating these routines.
3. Integrate improvement into project control by making continuous improvement part of "normal" steering (e.g., reporting, quality and progress routines) and using suitable indicators to make process stability and collaboration performance visible over time.
4. Promote participation and motivation of project participants by making the benefits of improvement tangible (e.g., fewer frictions, more stable workflows, better interfaces) and by visibly recognising and reinforcing achieved gains.
5. Frame perfection as sustainable project success by shifting attention from short-term target attainment (cost, time, quality) toward sustained delivery capability and treating each phase as a learning field for subsequent phases and future projects.

Participants linked these task fields to practices such as PDCA-based improvement cycles, structured lessons-learned and feedback loops, systematic standardisation and knowledge capture, transparent performance visualisation, root-cause analysis (5-Why), and post-occupancy feedback to extend learning into the next projects.

DISCUSSION

This study examined how the five Lean Thinking principles can be translated into owner-side project management in the German construction context. Across the workshops, participants described the owner side not merely as an external sponsor of Lean initiatives, but as a central

actor in shaping the organisational conditions under which Lean project delivery unfolds. The discussions repeatedly highlighted the same governance domains: defining and maintaining value, shaping information and decision processes, structuring interfaces and handovers, timing and releasing work and decisions, and establishing learning routines across phases. The findings thus suggest that owner-side Lean integration is less about adding isolated methods and more about redesigning the steering logic through which projects are managed.

A first important implication of the findings is therefore that the owner-side contribution to Lean Construction should be understood primarily at the level of governance rather than only at the level of operational method use. Existing Lean Construction literature has extensively discussed project delivery, production control, collaboration, and improvement practices at (operational) assignment level, often with a focus on designers, contractors, and execution-phase coordination. By contrast, the workshop discussions in this study repeatedly highlighted upstream and cross-phase steering issues that are more directly located at the owner side: defining and revisiting value, shaping decision premises, aligning stakeholders and interfaces, and creating the conditions for reliable downstream action. The contribution of this paper therefore lies in showing how the five Lean Thinking principles can be translated into owner-side management tasks that cut across project phases and organisational boundaries.

A second key insight concerns the relationship between existing practice and Lean-oriented development. Consistent with the conformity perspective discussed by Diekmann et al. (2003), the workshops suggested that many owner organisations and owner representatives already employ routines broadly compatible with Lean Thinking, even if not labelled as such. However, participants described these elements as often implicit, fragmented, and insufficiently connected, which limits their systemic impact (see also John et al., 2026). The principle-based framing is therefore valuable because it makes such latent alignments visible and links them into a more coherent management logic. Rather than representing a radical break with established project management, the findings point to an evolutionary reinterpretation and further development of existing practice.

A third discussion point concerns the paper's relation to existing frameworks. Prior work has addressed owner value, project governance, collaborative delivery models, and client capabilities. However, these discussions do not yet provide a sufficiently practice-oriented account of how owner-side project management can be systematically interpreted through the Lean Thinking principles. The present study therefore operates at a different level of abstraction: it complements existing delivery and collaboration frameworks by asking how the owner's steering and governance role can be aligned with Lean Thinking across the project life cycle. In this respect, the identified task fields should be understood as a principle-based orientation for owner-side project management within and across existing delivery arrangements.

This, in turn, suggests that owner-side project management is a particularly important locus for further developing Lean Construction beyond its still predominant association with operational project execution.

CONCLUSION

This paper addressed the question of how Lean Thinking can be integrated into project owners' project management. Using the five Lean Thinking principles as an analytical lens, an iterative series of focus-group workshops was conducted (i) to assess the extent to which current owner-side practice in Germany already reflects elements of these principles and (ii) to derive options for a more systematic implementation. The results suggest that many owner organisations and owner representatives already employ routines that are broadly consistent with Lean Thinking, although often implicitly and in fragmented form.

The paper contributes an initial principle-based orientation for project owners and owner representatives. It shows that owner-side Lean integration is most promising when understood

not as the isolated application of methods, but as a governance-oriented further development of project management across the project life cycle.

Given the expert-synthesis nature of the study, the small expert panel, and the German context in which the workshops were conducted, the proposed task fields and action options should be understood as an initial principle-based orientation rather than as broadly generalisable prescriptions and therefore require further empirical scrutiny.

Future research could proceed in four directions: translating the identified task fields into concrete routines and examining them in projects; comparing owner-side project management across owner types, project characteristics, delivery models, and national contexts, and how these differences affect the integration of Lean; analysing how this approach influences project outcomes; and developing maturity frameworks to support implementation and evaluation.

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