

A BOUNDARY-SPANNING PLAYBOOK FOR DIGITAL CONSTRUCTION INNOVATION

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ABSTRACT

Beyond the prevailing gap between academic research and industry practice, construction enterprises often lack the mechanisms to systematically identify and develop digital innovation opportunities embedded in their everyday operations. In practice, many operational challenges are recognized informally but are not consistently translated into digital tools, data-driven processes, or automation initiatives that can scale across the organization. Hence, this paper introduces the Boundary-Spanner Playbook as a structured framework that supports construction enterprises in systematically identifying and developing their internal innovation potential while institutionalizing collaboration with academia. The methodology adopts a Design Science Research approach and comprises six phases: Elicitation, Coding and Normalization, Prioritization, Mapping to Academic and Research Projects, Governance Setup, and Portfolio Replication. It operationalizes the boundary-spanning role as a repeatable process that translates operational challenges into digital tool-enabled innovation opportunities, integrating organizational learning and research translation. The framework is implemented within a large Canadian construction enterprise. Results demonstrate that the Playbook allows rapid identification and prioritization of digitally mediated innovation opportunities and embeds research collaboration within corporate decision-making structures.

KEYWORDS

Boundary spanning, digital innovation, industry-academia collaboration, research translation.

INTRODUCTION

The construction industry often faces a divide between research-driven innovation and practical implementation. Although universities regularly develop advanced digital and data-centric solutions, their integration into the workflows of construction enterprises remains sporadic and incremental (Gann & Salter, 2000; Loosemore, 2013). Industry projects operate under tight financial, schedule, and contractual constraints, leaving limited capacity for experimentation or structured innovation discovery (Gann & Salter, 2000; Slaughter, 1998). As a result, many promising research outcomes, such as artificial intelligence applications and robotics, remain confined to pilots or academic prototypes, rarely maturing into operational tools that deliver measurable value (Chen & Yin, 2025; Singh et al., 2025; Wu & García de Soto, 2022).

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Simultaneously, large construction firms generate significant volumes of tacit knowledge and local process innovations through daily operations (Salhab et al., 2026); this knowledge is often embedded in expert judgment and deliberately elicited and translated before it informs systematic improvement or digital tools (Pourrahimian et al., 2024). However, this experiential knowledge is fragmented across departments and seldom transformed into a cohesive learning system (Harty, 2005). Operational challenges, recurring inefficiencies, and technology gaps are often recognized informally but not systematically captured or synthesized into a strategic innovation roadmap (Souza et al., 2025). From a Lean Construction perspective, such fragmentation reflects breakdowns in information flow, variability in work practices, and waste in knowledge management: issues long identified by the Transformation-Flow-Value (TFV) framework (Bertelsen & Koskela, 2002) as fundamental barriers to performance and continuous improvement. Lean studies on waste in information processing further highlight how duplicated effort, inconsistent data structures, and undocumented lessons impede the creation of organizational value and disrupt learning cycles.

Recent Lean Construction research has begun examining how Lean principles can support innovation processes. For example, Lean thinking has been shown to structure the systematic identification and prioritization of organizational pain points (Etges & Caten, 2023). Also, Lean has been conceptualized as a managerial innovation in its own right that strengthens collaborative learning, shared value definition, and system-level integration (Zelenko & Maxwell, 2024). Despite these advancements, firms still lack practical and reproducible mechanisms that connect qualitative field insights with research-based problem solving and cross-functional coordination. The underlying constraint is therefore not a shortage of innovative ideas, but the absence of a structured method that supports flow, reduces information waste, and provides reliable decision-making pathways for innovation.

This paper proposes the Boundary-Spanner Playbook as a direct response to this challenge. The Playbook is a structured and Lean-aligned framework designed to help construction organizations systematically identify and develop their internal innovation potential while establishing a formal mechanism for collaboration with academia. It institutionalizes the boundary-spanning liaison function between research and industry, which transforms isolated interactions into a repeatable process that improves information flow and reduces variability in how innovation opportunities are discovered and evaluated. Using a Design Science Research (DSR) methodology, the Playbook consists of six phases: Elicitation, Coding and Normalization, Prioritization, Mapping to Academic and Research Projects, Governance Setup, and Portfolio Replication. In this study, innovation is examined through the lens of digital tools, data infrastructures, and automation technologies, as these are the dominant mechanisms by which large construction enterprises currently pursue organization-wide change. The framework is then applied and evaluated within a major Canadian construction enterprise to assess its utility in surfacing innovation themes and integrating academic inquiry with operational needs. The framework operationalizes core Lean principles such as flow, value, waste reduction, and continuous learning to advance both the theoretical foundation of boundary spanning and its practical implementation as a scalable model for enterprise-wide innovation governance and industry-academia collaboration.

LITERATURE REVIEW

Innovation in construction has long been recognized as both essential and difficult to institutionalize. It is often systemic and requires coordinated changes across multiple actors and project networks. Put simply, unlike manufacturing, where research, development, and organizational learning are embedded in structured production systems, construction operates through temporary and siloed project networks, limiting cumulative knowledge development. This condition underlies what Gann and Salter (2000) describe as the “project paradox,” where

project-level experimentation generates localized learning but rarely transfers into organizational innovation. Despite advances in digital tools, automation, and AI, many construction technologies remain confined to pilots or academic prototypes, unable to gauge due to organizational fragmentation, inconsistent decision-making structures, and limited mechanisms for systematic learning (Chen & Yin, 2025; Singh et al., 2025; Wu & García de Soto, 2022). In fact, although construction innovation spans organizational and process-based dimensions, recent research on Construction 4.0 emphasizes digital technologies, such as artificial intelligence, big data platforms, automation, and digital twins, as increasingly central mechanisms through which large construction firms pursue innovation and address coordination, quality, and productivity challenges (Yang et al., 2022).

Lean Construction research provides a theoretical foundation for understanding these persistent barriers. Koskela's TFCV theory (Bertelsen & Koskela, 2002) reframes construction as a production system in which the reliability of information flow and the creation of stakeholder-defined value are critical. Variability, rework, and discontinuities in information handoffs, which are frequently observed in construction enterprises, are, from a Lean perspective, forms of waste that inhibit innovation by disrupting organizational learning cycles. A study on reliable planning, conducted by Ballard and Howell (2003), further highlights the importance of commitment-based decision-making. However, innovation processes in many firms lack these stabilizing elements: priorities shift unpredictably, leadership alignment is uneven, and promising concepts stall due to unclear ownership. Importantly, Lean research has shown that these conditions are often shaped upstream by client behavior, as owners play a central role in defining value, structuring collaboration, and setting decision-making frameworks that enable or constrain flow. When clients retain unilateral decision authority or fail to enforce collaborative practices, they inadvertently amplify variability and undermine commitment reliability across the project system (Ghannoum et al., 2019). These conditions reflect the unreliable workflow patterns Lean Construction seeks to address.

Research on waste in information management reinforces these points. Formoso and Isatto (2014) demonstrate that organizations lose significant value due to fragmented and poorly integrated information and control systems, which contribute to different forms of waste. Studies show that the separation between production control, quality control, and information management leads to informal work packages and unreliable workflows, ultimately eroding project performance (Formoso & Isatto, 2014). Lean knowledge-management emphasizes the need for standardized learning flows, codification of insights, and repeatable organizational routines to support continuous improvement (Dave et al., 2013). Despite these insights, firms still struggle to transform scattered project-level experiences into strategic innovation roadmaps, leaving the "dual innovation gap" between research and practice—and within organizations themselves—largely unresolved. This shows that construction innovation tends to be tacit and distributed across project teams rather than centrally coordinated (Hastings & Finch, 2007; Loosemore, 2013; Slaughter, 1998). Large contractors often generate substantial experiential learning through their operations, yet this knowledge remains unstructured and inconsistently transmitted between projects. Without mechanisms to formalize discovery, prioritize opportunities, and integrate them with external research capabilities, firms struggle to scale promising ideas. Consequently, industry-academia collaborations frequently produce isolated prototypes that lack pathways for absorption, evaluation, or enterprise-wide adoption (Harty, 2005; Hastings & Finch, 2007; Souza et al., 2025).

Despite growing research on industry-academia partnerships in construction, existing studies largely focus on describing outcomes and success factors rather than providing operational mechanisms for systematic innovation discovery (Greco et al., 2021; Lavikka et al., 2020). The literature confirms that partnerships generate valuable product, process, and organizational innovations (Gluch et al., 2019; Greco et al., 2021; Shapira & Rosenfeld, 2011),

yet even successful initiatives face implementation barriers and partial adoption (Lavikka et al., 2020), highlighting a persistent translational gap. Prior work offers limited guidance on how construction firms can consistently surface and translate frontline operational challenges into adaptable innovation portfolios (Rutten et al., 2009). The Boundary-Spanner Playbook addresses this gap by moving beyond descriptive partnership models to offer a structured framework for institutionalizing innovation discovery within corporate governance.

METHODOLOGY

This research employs a DSR approach, which focuses on the creation and evaluation of structured artifacts that address real-world organizational challenges through iterative refinement (Hevner et al., 2004). DSR typically comprises three phases: problem formulation, solution development, and evaluation, which are detailed in the following subsections.

PROBLEM FORMULATION

Although prior research has examined barriers to innovation and industry-academia collaboration in construction, existing approaches tend to remain conceptual, descriptive, or tool-specific, offering limited guidance on how organizations can systematically operationalize innovation discovery and research translation. In practice, firms rely on informal processes, individual champions, or ad hoc collaborations, which makes innovation outcomes highly variable and difficult to replicate. This gap indicates the need for a structured and reusable artifact that embeds discovery and translation mechanisms within organizational routines. To this end, the Boundary-Spanner Playbook is conceived as a configurable artifact that reduces variability in innovation discovery and facilitates repeatable boundary-spanning between operational practice and academic research.

SOLUTION DEVELOPMENT AND EVALUATION

The Playbook, shown in Figure 1, follows six iterative phases that operationalize specific Lean principles: flow by reducing information handoff delays between phases, value through stakeholder-defined prioritization criteria, and waste reduction by standardizing coding taxonomies to prevent redundant rediscovery of insights. Elicitation involves mapping the organization's operational context and conducting semi-structured interviews to surface challenges, inefficiencies, and opportunities across diverse groups, reducing variability in inputs and improving reliability of knowledge flow. Importantly, the Playbook does not elicit innovation ideas directly; instead, it captures operational challenges and systematically reframes them into digital tool-based innovation opportunities through structured analysis. Coding and Normalization translate interview data into themes through inductive coding and a Five-Lens framework. This step minimizes interpretive waste and creates a stable structure for comparing diverse qualitative statements. Prioritization evaluates each opportunity using four dimensions. This phase helps focus attention on value-generating opportunities and supports more reliable decision-making by ensuring that initiatives are assessed against consistent criteria. Mapping to Academic and Research Projects reformulates high-value opportunities into research-ready questions, or vice versa, and identifies relevant academic partners, creating a pull-based mechanism in which research efforts originate from clearly defined operational needs rather than ad hoc interest. Governance Setup establishes roles, decision routines, evaluation criteria, and data-sharing guidelines to support predictable oversight and reduce ambiguity during implementation. Standardizing these decision pathways improves coordination while allowing local units to adapt execution to their context. Finally, Portfolio Replication codifies templates, taxonomies, and decision structures so future cycles can be executed more efficiently, reinforcing continuous improvement and strengthening the organization's long-term learning capability. To this end, the Playbook treats digitalization not

as a separate innovation category but as the mechanism through which surfaced challenges are operationalized, which transforms qualitative pain points into scoped initiatives involving software, data platforms, or automated workflows. Finally, the evaluation phase is conducted through an embedded case study within a large Canadian construction enterprise, assessing the Playbook's applicability and practical utility in a real organizational setting.



Figure 1: Framework Development Steps

FRAMEWORK DEVELOPMENT

As mentioned in the methodology, the framework comprises six integrated components, detailed in the following subsections.

ELICITATION

The Elicitation phase aims to build a comprehensive understanding of the organization's operational ecosystem before conducting targeted interviews. This stage involves familiarizing a liaison, who acts as the bridge between academia and industry, with the company's organizational structure, strategic objectives, digital systems, and geographical operations. Major business units, project delivery divisions, and digital toolchains are mapped to contextualize the innovation landscape and establish a consistent baseline for discovery. This preparatory work helps stabilize the inputs to the discovery process by making value-relevant information more visible and reducing variation in how issues are interpreted across units. Following organizational mapping, the liaison develops a semi-structured interview template to ensure consistency across discussions. The template prompts participants to describe pain points, data flows, system dependencies, and ongoing transformation initiatives. Participants are selected using a representative sampling approach to ensure coverage across functions, roles, and operational contexts, rather than relying on convenience or availability. Also, interviews are conducted individually rather than in group settings to reduce social desirability effects and groupthink bias in the articulation of challenges and opportunities. Elicitation intentionally captures both current-state problems and participant-identified improvement ideas or aspirational solutions, which supports subsequent stages in assessing the gap between existing conditions. The outcome is a structured qualitative dataset that forms the basis for subsequent coding and thematic synthesis. Although participants rarely articulate "innovation" explicitly, the elicitation process intentionally focuses on surfacing operational frictions, data gaps, and inefficiencies that could later be reformulated into digitally enabled innovation opportunities.

CODING AND NORMALIZATION

Following Elicitation, the qualitative data are subjected to an inductive thematic synthesis to identify recurring patterns of opportunity and constraint across divisions. Open coding is conducted, meaning each distinct statement is treated as a first-order item and assigned a

concise open code that captures its core idea. Standardizing this coding step reduces interpretive variability and ensures that insights enter the analysis in a consistent and comparable format. Examples include: 1) “QR stickers peel off when equipment gets dusty” → Material tracking pain; 2) “Cameras for detecting uneven surfaces” → Camera/vision interest; 3) “Claims take too long” → Claims processing overload.

Once open coding is complete, related codes are grouped axially into broader, conceptually connected themes. For instance, codes associated with Excel dependency, data sprawl, and fragmented systems are consolidated under Data Integration and Decision Support, whereas items related to computer vision, natural language processing, and AI-based estimating form the theme AI and Automation Readiness. Issues concerning labor shortages, retirements, and training needs are grouped under Workforce Capacity and Retention. This iterative synthesis produces a set of higher-order themes representing the organization’s principal digital innovation domains such as data integration, AI readiness, and automation potential. Individual statements may contribute to multiple themes when they address intersecting issues.

To indicate thematic prominence, frequency counts are generated to show how often themes appear across divisions, providing an empirical basis for subsequent prioritization. To further enhance conceptual clarity and reduce overlap, a normalization lens is applied to classify themes across five analytical dimensions: people, process, data, technology, and incentives. This lens allows insights from different contexts to be interpreted on a common footing by assessing whether challenges are human, procedural, informational, technical, or motivational, through five guiding questions on responsibility, workflows, information gaps, technology use, and incentives. For example, reliance on Excel-based safety reporting can be classified as a process and data issue, and interest in computer vision as a technology and process opportunity.

PRIORITIZATION

Once the thematic structure is stabilized through coding and normalization, the identified opportunities are prioritized to determine which advance to scoping and pilot design. This step translates qualitative insights into a structured innovation portfolio by applying a shared evaluation logic that reduces variability in decision-making and focuses attention on value-generating initiatives. Each opportunity is assessed using a four-dimensional model capturing: Value (V), defined by participating stakeholders based on perceived organizational or operational benefit; Feasibility (F), reflecting implementation ease given current technical and organizational conditions; Measurability (M), indicating the extent to which outcomes can be tracked through objective metrics; and Sponsor Readiness (S), representing internal ownership, leadership support, and funding pathways. These dimensions are context- and time-dependent as organizational capabilities evolve. Ratings are assigned on a five-point ordinal scale by a cross-functional working group including the liaison, divisional managers, and digital transformation leads. The four dimensions are aggregated into a Composite Priority Index (CPI), shown in Equation 1:

$$CPI = (V + F + M + S)/4 \quad \text{Eq (1)}$$

The results are positioned within a value–feasibility space (Figure 2), where regions represent indicative zones rather than discrete categories. High-value, high-feasibility items are interpreted as Quick Wins and prioritized for immediate internal pilots. Importantly, classifications such as Quick Wins are contingent on underlying data and system maturity; in environments with fragmented data, these initiatives may shift toward longer-term efforts. High-value but lower-feasibility initiatives are designated as Strategic Investments and earmarked for deeper R&D or academic collaboration, while moderate-value, moderate-feasibility items are treated as Incremental Improvements suitable for process optimization and learning-oriented pilots. Boundaries between categories are non-rigid, and certain initiatives

may span multiple regions depending on implementation scope and organizational context. Rather than aligning academic and industry timescales, the framework structures innovation into parallel streams of short-term operational initiatives and longer-term research investments.

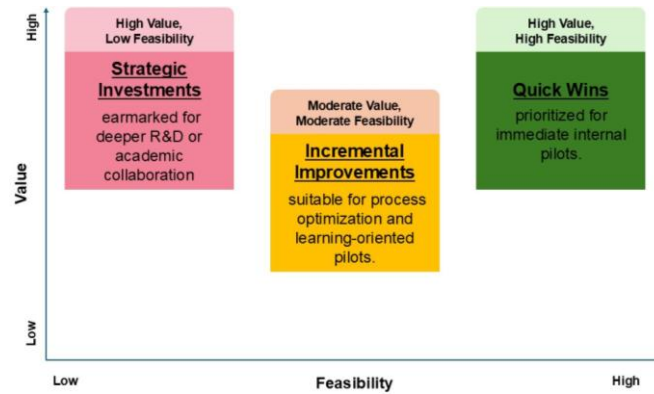


Figure 2: Value vs. Feasibility Space

To account for both strategic importance and organizational signal strength, thematic frequency is incorporated as an additional weighting factor. The frequency with which a theme appears across divisions serves as a proxy for its organizational salience. To avoid overweighting frequently mentioned but low-impact issues, thematic frequency is combined with CPI to compute a Weighted Innovation Score (WIS), shown in Equation 2 where Normalized Frequency indicate how often that theme appears across divisions. This weighting produces a ranked innovation portfolio that aligns qualitative prominence with value potential.

$$WIS = CPI \times Normalized Frequency \quad \text{Eq (2)}$$

MAPPING TO ACADEMIC AND RESEARCH PROJECTS

Following prioritization, this stage links high-value digital innovation opportunities to relevant academic research by translating operational challenges into structured and research-ready problem statements. Strategic Investment items are reframed as research challenges using a standardized template that captures operational context, data needs, and intended outcomes. These challenges are then matched with appropriate academic partners or ongoing research initiatives aligned with the identified needs. Collaboration parameters, including engagement models, data-sharing protocols, and expected deliverables, are defined to align academic efforts with organizational priorities. It is a two-way process where emerging research insights can as well proactively inform the organization of innovation opportunities not yet surfaced through elicitation. All collaborations are documented within the Playbook's innovation portfolio, creating a traceable pipeline from field-identified problems to research responses and vice-versa. Such linkage permits a managed exchange in which operational challenges inform research agendas and academic outputs re-enter the organization through pilot deployment.

GOVERNANCE SETUP

The governance setup phase establishes the structures needed to sustain and scale the Boundary-Spanner Playbook across the organization. Guided by the principle of “Standardize the What, Localize the How,” it ensures consistent innovation management while allowing divisions to adapt execution to their operational contexts. Ownership is defined by assigning each innovation theme to a responsible manager or theme lead, supported by a cross-functional steering committee that oversees resource allocation and go/no-go decisions. Governance reviews evaluate internal pilots and academic collaborations using standardized performance metrics, including criteria for determining when a pilot is ready to scale into broader operations. The steering committee oversees this transition, ensuring ownership transfers from the

innovation team to relevant business units. Data governance protocols define confidentiality and data-sharing boundaries. Periodic reviews incorporate feedback from completed initiatives to support continuous learning and guide next prioritization cycles as the Playbook evolves.

PORTFOLIO REPLICATION

The Boundary-Spanner Playbook is designed for replication across divisions or partner organizations as a mechanism for validation and long-term institutionalization of innovation discovery. Core templates, such as interview guides, coding taxonomies, and prioritization matrices, are standardized in a shared repository to ensure consistency while allowing contextual adaptation under the principle “Standardize the What, Localize the How.” Boundary-spanning representatives run internal Elicitation and prioritization cycles using the same lenses and scoring framework, with results aggregated into a consolidated innovation portfolio for cross-divisional comparison. Replicating the process in this consistent manner supports steady knowledge flow across units and reduces the rework that often results from fragmented learning practices. Iterative replication transforms the Playbook into a sustained governance practice, building cumulative learning and strengthening academic collaboration.

FRAMEWORK APPLICATION AND RESULTS

The Boundary-Spanner Playbook is applied within a large and diversified construction organization to evaluate its capacity to transform qualitative stakeholder input into a structured innovation portfolio.

Using the Playbook’s process, the liaison, who holds a PhD in construction management, conducts a structured innovation-discovery cycle over an eight-week period. Semi-structured interviews and internal reports are analyzed as the primary qualitative data sources. Each distinct statement describing a challenge, improvement idea, or technology opportunity is coded and thematically classified according to the Playbook framework. This process generates a comprehensive inventory of digitally mediated innovation themes spanning AI, data integration, automation, and knowledge-management domains. Through iterative synthesis, eight themes emerge as focal areas for innovation investment: 1) AI and Automation Readiness, 2) Data Integration and Decision Support, 3) Workforce Capacity and Retention, 4) Quality, Risk, and Compliance Modernization, 5) Operations and Logistics Optimization, 6) Procurement and Finance Digitalization, 7) Sustainability, and 8) Knowledge Capture and Reuse.

The thematic synthesis reveals several systemic barriers and cross-cutting opportunity areas typical of large-scale construction enterprises. Managers across divisions consistently cite fragmented systems and the persistent reliance on manual Excel-based workflows as major constraints. Integrating financial, safety, and quality data into a unified digital platform is identified as a foundational driver for process transparency and decision support.

There is also recurrent interest in applying AI to document-heavy and repetitive processes such as claims review, quality inspections, and fleet optimization. Yet, implementation maturity is low, indicating a need for structured experimentation and joint research pilots. Skill shortages and upcoming retirements are viewed as critical threats to productivity and institutional knowledge. Proposed interventions include AI-enabled training platforms, predictive analytics for workforce planning, and multilingual support chatbots for field operations. Paper-based inspection and turnover processes are consistently described as time-consuming and error-prone. Opportunities for automation include digital twin-based quality traceability and AI-assisted risk classification to accelerate review cycles and reduce rework. Respondents also highlight the growing need to integrate environmental and social performance metrics into procurement and project delivery. Several business units express interest in frameworks linking sustainability (e.g., through data-driven tracking, reporting, and decision-support tools) compliance with supplier and subcontractor performance evaluation.

Each innovation opportunity identified is evaluated using the Playbook's four-dimensional prioritization model: Value, Feasibility, Measurability, and Sponsor Readiness. The aggregated scores reveal three strategic evaluation zones: 1) Quick Wins, such as automating early estimation and dashboard standardization, offer immediate returns with low implementation risk; 2) Strategic Investments, including AI-based defect detection and automated claims triage, require further R&D and are flagged as candidates for academic collaboration; and 3) Incremental Improvements, such as standardized turnover documentation, serve as medium-term process enhancement projects that could be implemented through internal teams.

The CPI and WIS scoring process provides a clear quantitative structure for distinguishing between high-impact opportunities and those requiring deeper exploration. Opportunities with the highest CPI scores consistently align with themes of data integration, AI-supported decision-making, and quality-related automation, reflecting both strong organizational readiness and measurable value potential. Mid-range CPI items highlight process-improvement initiatives that are operationally important but require moderate coordination across divisions. Lower-feasibility but high-value opportunities, such as advanced computer-vision inspection and predictive workforce-planning models, are flagged as strategic research candidates. WIS further refines prioritization by highlighting opportunities that are high-value and widely observed across the organization.

The mapping phase translates the organization's highest-value, lower-feasibility opportunities into structured research challenges that could advance through academic collaboration. Reformulating strategic items into clear research questions and aligning them with relevant university expertise allows the Playbook to establish a direct pipeline between operational needs and scholarly inquiry. This step roots academic work in real operational needs and opens access to analytical tools and early-stage experimentation.

The liaison encounters several challenges while implementing the Playbook, most notably resistance to change among staff who are cautious about adopting new processes and skeptical of yet another innovation initiative. Limited leadership alignment further complicates progress, as shifting priorities and uneven executive sponsorship make it difficult to maintain consistent momentum. At the strategic level, the liaison must balance pressure for quick, tangible wins with the organization's longer-term research and development goals, navigating tensions between immediate operational value and investments that require sustained experimentation.

Although full governance deployment is not completed during this initial cycle, the Playbook application aids the organization to outline the structures needed to support ongoing innovation management. Two priority projects are identified, and their core stakeholder groups are assigned. Building on this momentum, the next step is to establish preliminary governance structures, including theme leads who oversee progress, standardized criteria for evaluating academic contributions, and a steering group responsible for reviewing pilot outcomes and resource requirements.

The replication phase is not fully implemented during the initial cycle; however, the Playbook's standardized templates and coding approach demonstrate potential for broader application across additional business units. The case study confirms that the elicitation, coding, and prioritization components can be systematically reused, allowing future cycles to expand the innovation portfolio and enable cross-divisional comparison.

DISCUSSION

This study situates digital innovation as the dominant mode through which innovation is operationalized and scaled in contemporary construction practice. The findings indicate that innovation within the case organization is predominantly articulated and pursued through digital tools and data-driven interventions, rather than through standalone organizational or contractual changes. This suggests that, in large construction enterprises, digital technologies

function as the primary translation layer through which operational challenges are rendered researchable. The findings also reaffirm the “project paradox” (Gann & Salter, 2000), whereby project uniqueness stimulates local innovation but limits cumulative learning. The framework addresses this tension by converting informal insights into structured organizational knowledge.

Moreover, the Playbook advances boundary-spanning theory by institutionalizing a traditionally informal role. Building on Tushman and Scanlan's (1981) conception of boundary spanners as two-way translators, the framework codifies their function as a managed process that links field-derived challenges with research-ready questions and reintegrates academic outputs into governance-based decision-making. This formalized knowledge loop replaces ad hoc personal networks with a traceable pipeline between academia and industry. From a governance perspective, the results align with Winch's (2012) principle of “standardize the what, localize the how.” Centralized evaluation criteria and metrics, and localized pilot execution facilitate coordination without suppressing local experimentation. The prevalence of incremental and “hidden” innovations observed in this study, such as micro-process improvements confirms earlier findings by Slaughter (1998) and Hastings and Finch (2007). The Playbook contributes a missing mechanism to surface and compare these improvements.

The findings suggest that innovation constraints in construction are less about idea scarcity and more about the absence of reproducible systems for prioritization. The Playbook demonstrates how research and practice can coexist within a single management system where operational insights guide inquiry and research outputs re-enter practice through measurable pilots. Finally, the study highlights the role of design thinking in early-stage innovation discovery. Although empathy and problem reframing can broaden how needs are articulated, prior research shows that value judgments are often shaped by cognitive biases such as anchoring, and status quo (Brown, 2008; Kahneman, 2011; Liedtka, 2015). The Playbook's structured mechanisms help mitigate these biases by stabilizing representations of qualitative insights and anchoring decisions in shared criteria. Nonetheless, the findings indicate that innovation liaisons must remain attentive to how perceived value reflects existing mental models as much as underlying organizational needs.

CONCLUSION

This paper presents a framework for accelerating digital innovation discovery and strengthening research translation within construction enterprises. The Playbook provides an operational pathway for converting dispersed project-level insights into prioritized innovation portfolios. Its application within a large Canadian contractor demonstrates that innovation opportunities embedded in everyday practice can be surfaced, evaluated, and aligned with strategic decision-making within weeks. Academically, the study contributes a framework that bridges construction innovation research with organizational practice. Practically, the Playbook offers construction organizations a repeatable mechanism for innovation discovery and for embedding academic collaboration within formal governance structures. The Playbook's validation is tested within a single organization over one innovation cycle; further applications across different firms and settings are needed to assess scalability, robustness, and long-term impact. Future research can refine the framework and examine its role in supporting sustained innovation governance and research integration in complex construction environments.

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