exploitation. It has been applied in several areas, e.g., exploitative vs. explorative learning (Holmqvist 2004), exploitative vs. explorative innovation (He and Wong 2004), exploitative vs. explorative alliances (Rothaermel and Deeds 2004), and exploitative vs. explorative managerial activities (Mom *et al.* 2009).

Earlier studies often conceived of ambidexterity as a competitive relationship (Simsek *et al.* 2009). Thus, discussions have focused on the conflict between exploration and exploitation. The coexistence of exploratory and exploitative activities in the same organization is achieved through the establishment of mechanisms for the separation of time and space (Eriksson 2013). The temporal separation of exploration and exploitation has been explained as sequential ambidexterity (Duncan 1976, Adler *et al.* 1999, Simsek *et al.* 2009). The separation of business units to support these activities has been termed structural ambidexterity (Benner and Tushman 2003, Simsek *et al.* 2009).

From the perspective of opposition and conflict, the interdependent relationship between exploration and exploitation is ignored. In highly dynamic environments, sequential and structural ambidexterity has become increasingly cumbersome and inadequate for flexible responses to external changes. Birkinshaw and Gibson (2004) proposed the concept of contextual ambidexterity, which is characterized by complementary processes. Alignment- and adaptability-focused activities constitute structural ambidexterity when completed in separate units or teams. Employees divide their time between these activities to achieve contextual ambidexterity (Birkinshaw and Gibson 2004).

Ambidexterity in project-based organizations

In project-based organizations, the project is the control unit. Structures, strategies, and capabilities are arranged, and traditional company and industrial boundaries are often crossed to meet the needs of the project (Hobday 2000). The focus of project-based organizations has shifted to the management of the relationship between projects and the environment (Kwak *et al.* 2015). Eriksson (2013) introduced the concept of project-based organizational ambidexterity. Using the construction project as an example, Eriksson (2013) discussed the role of structural, sequential, and contextual ambidexterity in solving problems in construction project organizations. Sequential or structural separation, such as focusing on exploration in the early stages and exploitation toward the end of a project, is more appropriate in stable environments (O'Reilly and Tushman 2008, Andriopoulos and Lewis 2010, Raisch *et al.* 2009, Eriksson 2013).

Structural solutions to the problems caused by the separation of design and construction are insufficient; however, contextual ambidexterity is a viable option (Gibson and Birkinshaw 2004, Eriksson 2013). Contextual ambidexterity can be achieved through joint specification, multi-criteria partner selection, incentive-based payment, collaborative tools, and cooperative procurement (Eriksson 2013). Awojide *et al.* (2018) discussed the implementation of managerial ambidexterity in the project delivery process. They asserted that contextual ambidexterity emphasizes the complementary relationship between exploration and exploitation. In contrast, structural ambidexterity stresses mutually exclusivity. However, the ambidexterity of project-based organizations in the context of LC has not been addressed.

Paradoxical thinking

The paradoxical effect in lean construction projects

Smith and Lewis (2011) defined a paradox as a series of contradictory but interrelated simultaneously and continuously existing elements. These elements contain these potential tensions and react to embrace them simultaneously (Smith and Lewis 2011). The terms dilemma and paradox are sometimes used interchangeably; however, there is an important difference. A dilemma involves weighing the pros and cons of a situation; however, a paradox is distinguished by the absence of this option (Storey and Salaman 2009).

The value of paradoxical thinking comes from this duality (Storey and Salaman 2009). The paradox is an intrinsic characteristic of a dynamic factor in an organization (Beech *et al.* 2004). The management of paradox involves not its elimination but, rather, the exploitation of its incentive potential (Andriopoulos and Lewis 2009). The creative capture of two extremes is considered the effective management of paradox (Eisenhardt 2000, Andriopoulos and Lewis 2009).

The concept of the paradox has been examined in various contexts. Smith and Lewis (2011) identified four types of paradoxes based on the core activities and elements of organizations. They discussed the paradoxical tensions of learning, belonging, organization, and performance. Storey and Salaman (2009) discussed six paradoxes in business: strategy, structure, performance, innovation, knowledge, and change. Samset and Volden (2016) defined ten paradoxes in projects. At the team level, the innovation paradox is discussed so that it can be addressed (Miron-Sspektor *et al.* 2011, Thayer *et al.* 2018). At the individual level, it is reflected mainly in terms of belonging (Lewis 2000). Paradoxical tensions are

distributed in three ways: uniquely at each level, simultaneously at all levels, or nested and concatenated at one level, thereby engendering new tensions at another (Smith and Lewis 2011).

Lean projects are temporary production systems designed to maximize value and to minimize waste in the product delivery process (Ballard and Howell 2003). In LC projects, the application of the JIT method has resolved the quality–efficiency paradox by simultaneously achieving both goals rather than making tradeoffs (Storey and Salaman 2009). However, some paradoxes remain (Smith and Lewis 2011). Studies have identified the following categories of paradoxes in LC projects:

Paradoxes exist at all levels. For example, in learning, the paradox is the exploitation vs. the exploration of existing knowledge and technologies (Eriksson 2013).

Paradoxes exist uniquely at the construction project level. The success paradox arises under project management constraints. Short-term performance is the achievement of a certain output within a specific project budget and schedule. A long-term consideration should be sustainability across the entire project life cycle (Samset and Volden 2016). In addition, the distance paradoxical tension exists between the temporary and permanent organization. Project autonomy is intended to minimize disturbance from the environment. However, in project organizations, it also increases the difficulty in subsequently integrating the project activities into the overall processes (Eaton *et al.* 2015).

New paradoxes arise at the project level because of activities at other levels. For example, paradoxes at the individual level lead to paradoxes at the project level. Individual cognition leads to one pole of the paradox being considered positive and the other being

considered negative. This creates underlying tensions (Maalouf and Gammelgaard 2016). Different cognitions and values lead to different behaviors. Thus, stakeholders' pursuit of different goals results in paradoxical tensions at the team or project level.

Paradoxical tensions are reinforced by lean thinking. One paradox is JIT and buffer. JIT originates from the Japanese Toyota management model, and it pursues the continuity and perfection of the process. Zero inventory is ideal. Interruptions can occur at any stage between raw material management and product delivery. Therefore, some inventory or buffer is necessary (Liker 2004). A smaller inventory buffer might be suitable for sustaining construction to keep up with installation. A large buffer could be costly. Appropriate buffering can improve the JIT process (Tommelein and Weissenberger 1999, Tommelein 2020). Should all buffers be eliminated? JIT seems to reinforce the paradoxical tensions. Another paradox in the lean approach is the use of standard operating procedures vs. custom-crafted solutions (Eaton *et al.* 2015). Lean thinking emphasizes standardization, which generates repeatable solutions. However, innovative or unexpected project tasks require custom-crafted solutions (Eaton *et al.* 2015). Yet another paradox in the lean approach is the engineering vs. customer-orientation mindset. Lean thinking emphasizes customer value; however, engineering orientation is also important in a project (Kohtamäki *et al.* 2020).

Paradoxical thinking and organizational ambidexterity

Paradoxical approaches focus on "both" rather than "either/or." This requires some form of ambidexterity. Ambidextrous organizations allow for the coexistence of apparently inconsistent tendencies (Storey and Salaman 2009).

At the introduction of the concept of ambidexterity, the management of exploration and exploitation was considered a dilemma. Organizational ambidexterity can be sequential or structural. This refers to the separation of time or space to facilitate exploration and exploitation. In reality, it is a choice between exploration and exploitation at a certain moment or in a certain structure. The emergence of contextual ambidexterity, which is viewed through the lens of paradox, emphasizes the role of simultaneous exploration and exploitation in organizational success (Smith and Lewis 2011). Smith and Tushman (2005) called for the realization of ambidexterity through paradoxical thinking. Andriopoulos and Lewis (2009) theoretically analyzed the role of paradoxical thinking in promoting a virtuous circle of ambidexterity. In a paradoxical solution, ambidexterity is achieved by simultaneously creating tight and loosely coupled organizational structures (Storey and Salaman 2009).

Issues in the definition of lean construction capabilities

Definition of LC ambidextrous capability

The development of solutions to the inherent paradoxical tensions in LC project organizations requires contextual ambidexterity. Contextual ambidexterity emphasizes the pursuit of a balance between two capabilities rather than the separation of structures or sequences. Time is allocated to activities related to the two complementary capabilities (Birkinshaw and Gibson 2004). LC capabilities include the achievement of rigid project goals while flexibly responding to project uncertainty rather than choosing one approach over another. Thus, LC capabilities include the characteristics of contextual ambidexterity, which is defined in this study as follows:

LC capabilities are an organization's or individual's capacity to achieve LC goals by solving conflicting and interdependent issues. LC philosophy, principles, and methods are incorporated to resolve the paradoxical tensions in LC projects.

Ambidexterity in LC represents two capabilities that deal with opposing characteristics. This duality suggests that it should be a two-dimensional construct.

Dimensions of lean construction capabilities

According to March (1991), exploitative activities are always connected to refinement, implementation, selection, and efficiency. Exploratory activities are associated with search, variability, discovery, and experimentation. The activities of organizational ambidextrous learning, innovation and adaptability refer to the same underlying constructs of exploration and exploitation but with different labels in different contexts (Raisch and Birkinshaw 2008). On the basis of March's (1991) dimensions of ambidexterity, two LC capability dimensions were identified: exploitative and exploratory capabilities.

The lean construction exploitative capability dimension

The exploitative capability of LC is rigid. All variability is eliminated to achieve flow continuity, standardization, modularization, and the ideal state for zero inventory. Unlike variation tolerance, LC exploitative capabilities refer to the ability to maintain consistency and efficiency. The focus is the beneficial use of organizational knowledge and technology.

The lean construction exploratory capability dimension

The exploratory capability in LC refers to the flexibility to eliminate the waste caused by the inability to cope with variability. It is derived from the absorption of demand fluctuations and the possession and flexible deployment of abundant multiskilled resources to various functions while ensuring system sustainability (Horman 2001). Exploratory capabilities facilitate employee participation, tolerate variation, encourage employee experimentation, and promote a continuous-improvement culture.

The dynamic balance between the two dimensions

In a project life cycle, LC exploitative and exploratory capabilities are not permanent. They have dynamic characteristics. This ambidexterity is presented as contextual ambidexterity. It is driven by project consistency requirements, short-term efficiency and benefits, and project constraints. In contrast, exploratory capabilities are influenced by personalized needs, long-term benefits, and continuous improvement.

Under the driving force, the development of exploratory capabilities can promote a continuous-improvement culture, long-term cooperation among suppliers, and social capital accumulation. This provides long-term benefits that facilitate the continuous growth of the exploitative capabilities of LC (Eriksson 2013; Luger *et al.* 2018). The development of exploitative capabilities can facilitate the continuous achievement of short-term goals and the related benefits. It is a prerequisite for the acquisition of exploratory capabilities and the foundation for the development of new technologies and products to meet the personalized needs of customers (Eriksson 2013, Farjoun 2010, March 1991). The coexistence of the two

complementary capabilities forms a virtuous circle that promotes ambidexterity to achieve a dynamic balance in LC.

Conceptual framework for lean construction ambidexterity in project-based organizations

In complex environments, the success of engineering projects depends on the exploitation of existing capabilities and the exploration of innovative solutions (Liu *et al.* 2012). The project environment creates the conditions for investigating ambidexterity because the project manager promotes exploitation through planning and control. In contrast, project novelty and knowledge demands necessitate exploration (Turner *et al.* 2015). All project organization contexts do not support the management of both exploitation and exploration. The creation of an appropriate project context could promote ambidexterity (Liu *et al.* 2012).

There is a lack of research on the achievement of ambidexterity in construction projects. Eriksson (2011, 2013) created a new starting point for project-based organizations to achieve a balance between exploration and exploitation. This informed the case studies of Liu *et al.* (2012) on approaches for achieving ambidexterity at various stages of construction projects. Thus far, studies have discussed the project elements that facilitate the achievement of ambidexterity or the approaches that facilitate both exploitation and exploration. However a comprehensive understanding of project-based organizations with these favorable characteristics is needed. The present study explored and categorized the characteristics of LC ambidexterity in project organizations to create a clear, logical structure and to provide practitioners with a template for planning and implementation.

Characteristics of lean construction project-based organizations

A project is defined as a "unique, transient endeavour undertaken to achieve planned objectives" (APM 2012: 241). It has also been explained as an adaptive process involving the coevolution of problem formation and solution generation to incorporate project changes (Whelton and Ballard 2002). Both definitions emphasize the environmental changes encountered and the ensuing responses during the project.

A project-based approach weakens the bureaucratic nature of traditional organizations. Project managers focus more on the relationship between projects and the environment (Kwak *et al.* 2015). The context of each project is unique. Thus, the manager's experience plays a pivotal role, and this leads to great variability in project management practices (Alshawi and Ingirige 2003). Non-lean project organizational management is characterized by the absence of standard processes (Ballard 1997, Alshawi and Ingirige 2003).

In LC project-based organizations, LC methods, principles, and techniques are applied to achieve the goals of construction projects. The use of LPS™ and other lean technologies facilitates the involvement of downstream participants in upstream decisions (Ballard and Howell 2003). Therefore, LC project-based organizations are more enabling. Besides, LC project-based organizations are equipped with flexible standard operations (Salem *et al.* 2006). This compensates for the absence of bureaucracy, which is inherent in typical construction projects, and facilitates the development of the exploitative capabilities in LC. The integration requirements in LC project-based organizations facilitate the achievement of contextual ambidexterity.

Table 1 summarizes the characteristics of coercive non-project organizations, non-lean project-based organizations, and LC project-based organizations. It outlines the benefits that accrue to LC project-based organizations because of their ability to overcome the deficiencies of the other two types of organizations in terms of organizational structure, authorization mechanisms, and procedures and standards implementation.

Table 1. Comparison of organizational characteristics

Categories	**Coercive non-project organizations**	**Non-lean project-based organizations**	**LC project-based organizations**
(1) Authorization mechanisms	Concentration of power; autocratic formulation process; positional authority (Adler 1999)	Command and control; project managers have very high status and direct control (Hobday 2000); specialists make decisions sequentially (Ballard and Howell 2003)	Enabling disciplines; downstream participants are involved in upstream decisions (Ballard and Howell 2003)
(2) Standards and procedures implementation	Coercive constraints (Adler 1999)	Lack of standard processes; project management is always influenced by the project	Standardized processes; emphasis on the production system and the realization of

			manager's experience (Alshawi and Ingirige 2003)	transformation–flow–value (Ballard and Howell 2003)
(3)	Organization structure	Complex hierarchical structure distinguished by top-down control (Adler 1999)	Separation of product and process design; the subsequent processes are not considered at the design stage; stakeholder interests are not aligned (Ballard and Howell 2003)	Early involvement of key participants (Alarcón *et al.* 2013); all lifecycle stages are considered in design; stakeholder interests are aligned (Ballard and Howell 2003, Alarcón *et al.* 2013)

Conceptual framework for lean construction ambidexterity in project-based organizations

Following the clarification of the characteristics of LC project-based organizations, a conceptual framework was developed to explain the fit between LC project-based organizations and the ideal context for achieving the balance of ambidexterity.

Construction projects are regarded as complex sociotechnical systems (Saurin *et al.* 2013) comprising artifacts, knowledge, capital, labor, and cultural meaning (Pan and Ning 2015, Soliman *et al.* 2018). Adler (1999) identified four types of project-based organizations with technical and social structures: coercive bureaucracy, enabling bureaucracy, autocratic

organization, and organic organization. The technical structure comprises a series of rules and procedures. An organization with a rigid technical structure is highly bureaucratic, and organizations with a social structure may be coercive or enabling (Adler 1999). Regarding the technological and social dimensions of traditional organizations, there may be variations in the rules, norms, and incentives in order to facilitate exploration or exploitation (Awojide *et al.* 2018). Exploration is often associated with organic structures, loosely coupled systems, path-breaking, improvisation, autonomy and chaos, and emerging markets and technology (He and Wong 2004, Awojide *et al.* 2018). In contrast, exploitation is often associated with mechanical structures, tightly coupled systems, path dependence, routinization, control and bureaucracy, and stable markets and technologies (He and Wong 2004, Awojide *et al.* 2018). **Figure 2** presents framework for organizational types and related LC ambidexterity characteristics according to Adler's four categories of organizations.

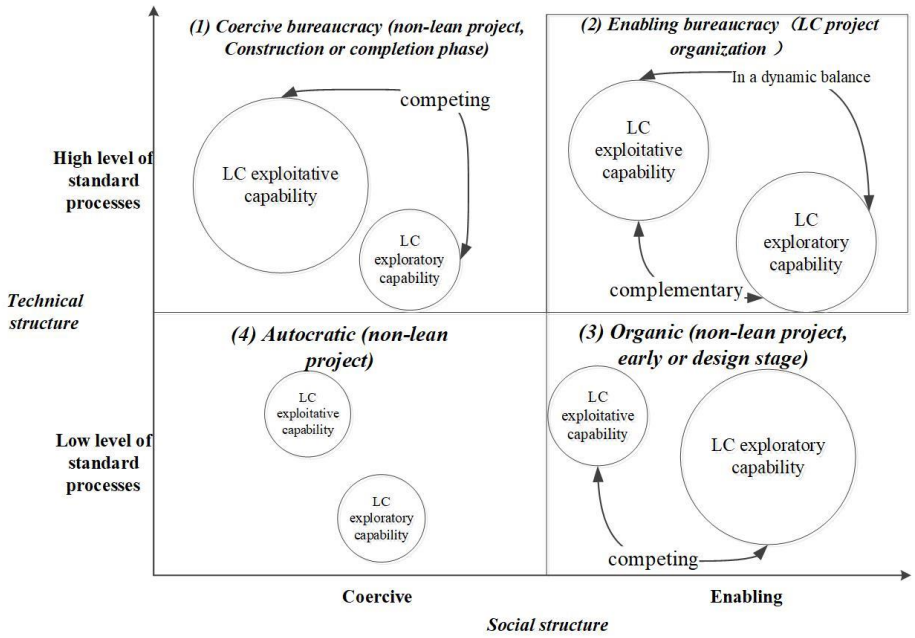

Figure 2. Framework for organizational types and related lean construction ambidexterity characteristics

Coercive bureaucracy. Quadrant 1 illustrates the competitive relationship between organizational exploitative and exploratory capabilities. In cases of high levels of standard processes and coercive constraints, the conditions are favorable for the development of exploitative capabilities but unfavorable for the development of exploration capabilities. This scenario is usually a business unit in a phase of a non-lean project. For example, the construction and closure phases of a non-lean construction project may emphasize exploitation (Eriksson 2013).

Organic organization. In Quadrant 3, the organization empowers employees and minimizes rules and procedures. The exploitative and exploratory capabilities are mostly

competitive. Experts tend to set standards that are unrealistic and difficult to implement. However, over-authorization (monitoring every step until everyone agrees) will lead to chaos (Liker 2004). The number of exploratory activities increases, and the number of exploitative activities decreases. This is often the case in the early stages of non-lean construction projects. In the design phase, the focus is on exploration rather than exploitation (Eriksson 2013).

Autocratic organization. Quadrant 4 shows that the environment and top-down control with minimal standard procedures and hierarchical control inhibit the development of exploitative and exploratory capabilities. Neither the exploitative nor exploratory capabilities are strong. In non-lean project organizations, the centralization of power (Hobday 2000) and the lack of standards (Alshawi and Ingirige 2003) restrict exploration and exploitation.

Enabling bureaucracy. In Quadrant 2, Liker's (2004) assertion that the best practice is the enabling bureaucracy is confirmed. Organizations with bureaucratic enabling characteristics are better suited for developing LC ambidexterity, which creates a leaner construction project-based organization. The present study analyzed the characteristics of LC project-based organizations and their advantages over non-lean project organizations. LC project organizations overcome the shortcomings of the excessive concentration of power and the lack of standards in non-lean project organizations. In addition, the greater integration in LC project organizations overcomes the problem of fragmentation in traditional projects. The enabling environment promotes the development of exploratory capabilities. Superior authorization mechanisms facilitate the upward and downward flow of information and resources to achieve organizational flatness and flexibility (Murphy and Sauter 2004, Akella 2007). The high degree of standardization enables the development of exploitative

capabilities. LC project-based organizations are characterized by the interdependence between exploitative and exploratory capabilities, which are strengthened by this complementarity. LC ambidexterity is presented as contextual ambidexterity. The two capabilities would support the development of good working environment.

Achievement of ambidexterity in lean construction project-based organizations

Studies have explored the realization of sequential or structural ambidexterity in project organizations by separating exploitation and exploration through time and structures (merging of the first and third quadrants in Figure 2; Liu *et al.* 2012, Eriksson 2013). However, ambidexterity might not be realized because of fragmentation or structural separation in typical non-lean projects (Liu *et al.* 2012). The sequential separation of design and construction has been found to result in project delays and poor constructability (Eriksson 2010). The lack of exploitative capabilities during the design process affects productivity. This separation also hinders the exploration of solutions in the construction phase because of the lack of joint problem-solving capabilities (Korczynski 1996, Eriksson 2013). Sequential or structural ambidexterity is appropriate only in more stable environments. As the complexity of the project environment increases, contextual ambidexterity requires the simultaneous development of LC exploration and exploitative capabilities (Eriksson 2013).

LC project organizations are more authoritarian and integrated. Production is the focus, and buildability is considered during the design stage (Ballard and Howell 2003, Alarcón *et al.* 2013). LC project organizations provide the ideal environment for the development of ambidexterity.

Discussion

The LC project environment has been shown to facilitate the maintenance of the balance in contextual ambidexterity. This section discusses the benefits of this capability in construction projects and the elements that promote its development.

Applications of ambidexterity in lean construction

Lean tools have facilitated the application of ambidexterity to the resolution of paradoxes. For example, JIT approaches address the quality–efficiency paradox (Storey and Salaman 2009). Total quality management, which is customer- and process-oriented, facilitates cost savings and shorter cycle times while increasing customer satisfaction (Koskela *et al.* 2019b). A mass customization strategy allows for the provision of a variety of products for capturing customer needs while meeting the costs and lead time of mass production (Tillmann and Formoso 2008).

In addition to facilitating the application of specific tools to solve certain local problems in production management, ambidexterity can be gradually extended from LC to other areas, such as project organization. For example, ambidexterity can help to resolve the problems caused by the separation of project design and construction and to balance competing individual and organizational interests.

Promotion of ambidexterity in lean construction

The elements that promote the development of exploitative and exploratory capabilities to achieve a dynamic balance in LC are discussed below.

Commitment and cooperation

Tiwana (2008) found that close connections between project alliance partners promoted ambidexterity in projects. A more committed network promotes mutual trust, information transparency, and knowledge sharing among members. In addition, it creates an atmosphere that enables innovation, which enhances the exploratory capabilities in LC. With a committed network and close cooperation, the trust relationship is strengthened (Viana *et al.* 2011). In addition, exploitative and exploratory capabilities are mutually promoted and improved to achieve a dynamic balance.

A common approach is the integrated project delivery collaboration model (Tillmann *et al.* 2012). The application of concepts from the lean and building information models can also promote communication and collaboration (Sacks *et al.* 2010, Ardila and Francis 2020, Evans *et al.* 2021). The LPS™ enables a short feedback circle of planning and corresponding, requires team members to make a solid commitment, and encourages the acceptance of diverse perspectives in decision-making to minimize losses (Saurin and Rooke 2020, Lagos and Alarcón 2021).

Project organizations as production systems

As is the case with the Lean Project Delivery System™, the system view is holistic and integrated. Ballard (2008) emphasized functional interdependence and information and resource integration (Ballard 2008). The LPS™ is an important system tool that emphasizes employees' authorization to plan and arrange specific tasks (Daniel *et al.* 2019). However, planning activities also include buffering work activities and focusing on overall efficiency

rather than local efficiency. From a systematic perspective, the functional resonance analysis method can be used to model variability propagation in LC (Saurin 2016), thereby improving uncertainty prediction and compensating for the lack of plan flexibility. These system methods enable the achievement of short-term project goals, thus enhancing the exploitative capabilities of LC. The system view facilitates the implementation of exploratory quality management practices that focus on overall rather than local costs. It also focuses on learning feedback, buffer management, resilience engineering, and sustainability to improve exploratory capabilities. The mutual complementarity of exploitative and exploratory capabilities contributes to the achievement of a dynamic balance in LC.

A culture of organizational learning and continuous improvement

Learning organizations are flexible; thus, they can respond to new challenges more quickly (Jiménez-Jiménez and Sanz-Valle 2011). LC project organizations emphasize scientific practices and standards; however, standardization is not a fixed implementation or a fixed layer. In LC project organizations, standardization is the basis for continuous improvement and a tool for empowering employees to achieve innovation based on standards. Variability is eliminated, and product quality is enhanced (Michaud *et al.* 2019). It has facilitated the development of exploitative capabilities. Organizational learning and continuous improvement, including the implementation of standard operating procedures and the elimination of outdated and rigid standard processes, provide a basis for project members to continually explore and innovate (Cottyn *et al.* 2011). The two are complementary, and standardization and continuous improvement are mutually reinforcing.

Conclusions and Future Research

On the basis of a review of the LC literature, organizational ambidexterity, and paradox, this study explained the nature and benefits of ambidexterity in LC. The study found that the rigidity and flexibility of LC stem from the main understandings of variability in current literature. The review revealed the lack of a clear definition of the concept of LC capabilities. The study proposes that it involves ambidexterity.

Ambidexterity in LC was found to be a two-dimensional paradox between exploitative and exploratory capabilities. Thus, the traditional view that LC capabilities are focused on either exploitation or exploration was rejected. The study argues that the exploitative and exploratory capabilities of LC are interdependent. They are therefore achieved through a dynamic balance. A conceptual model of LC ambidexterity is proposed for project-based organizations. LC project-based organizations were found to provide the ideal context for developing this capability.

This study contributes to the knowledge and future applications of organizational ambidexterity theory in capability development in LC. It facilitates project practitioners' understanding and management of the paradoxical tensions in LC projects. It improves construction practitioners' understanding of the capabilities needed for implementing LC projects. The proposed framework can guide practitioners in the creation of ideal LC project organization environments. An additional contribution is the identification of the elements that promote ambidexterity in LC.

The study offers new insights and opens up a new debate on the development of LC ambidexterity in construction. It provides a new starting point for discussions on the

application of the LC philosophy in project organizations in future research. A limitation is the proposed framework. The first iteration is presented in this study; thus, empirical verification is needed. The plans for further development are presented below.

First, the framework's effectiveness will be verified through a case study. Four typical project-based organizations that parallel the four organizational categories in the model will be studied to understand the relationship between their LC exploratory and exploitative capabilities. Second, the measurement indicators of each LC ambidexterity dimension will be studies. Third, the factors that affect the balance in ambidexterity in the proposed model will be further analyzed. The antecedent factors, such as social networks, in ambidexterity and the ambidexterity–performance relationship will be explored in future studies.

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Data availability statement

Data generated during the study are available from the corresponding author by request.

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