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Tackling Tensions between Project Owner and Project Manager in Benefits Realization of Public Projects: A Paradox Perspective

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***Abstract*— The project owner and manager are responsible for project benefits realization and project delivery, respectively. While the project owner and manager are of close interdependence, they face paradoxical tensions. This poses significant challenges for project benefits realization. Thus, this research aims to explore the evolution of paradoxical tensions between the project owner and manager in public projects. Qualitative research was drawn with 22 interviews (13 individual and 9 group interviews involving 59 interviewees) and three real-life cases. This research presents a paradox framework that encapsulates owner-manager tensions at three project phases, coping strategies, and the resulting tension dynamic cycle (i.e., vicious cycle or temporary balance). This study extends project management literature by revealing multiple-phase and dynamic tensions between the project owner and manager from the paradox perspective, and proposing strategies to address tensions for project benefits realization.**

***Index Terms*— Public project, Interdependence, Paradox, Tension, Benefits realization.**

I. INTRODUCTION

THE project owner and the project owner's manager play crucial roles in the benefits realization of public projects [1], thereby contributing to the overall welfare of society. The project owner is often responsible for benefits and value propositions at the project front-end phase, and public service delivery at the operation phase [2]. The project owner's manager, whether internal or external [1], is tasked with acting as the owner's surrogate and delivering project outputs at the execution phase [3, 4]. Recent studies have highlighted strong owners with internal managers [5], yet project owners employing external project management (PM) firms due to limited internal capabilities or unique policy requirements are equally noteworthy. Without adequate inter-organizational cooperation between the project owner and the external project manager, deficiencies in defining benefit propositions, compromised benefits delivery, and suboptimal operational performance may ensue [6]. This study thus specifically examines interactions between the project owner and the external project manager.

Many paradoxical tensions, characterized by interdependent yet contradictory elements, pervade the cooperation between the project owner and the external project manager. These tensions primarily revolve around two aspects: empowerment versus control, and short-term versus long-term benefits. First, the project owner needs to set controls to mitigate the project manager's potential opportunism while empowering them [3, 4, 7]. Second, discrepancies in priorities arise as project owners focus on long-term benefits, whereas project managers often aim for short-term compliance [6, 8]. These tensions are often perceived during exogenous or endogenous changes in the project [9]. Misunderstanding or improper responses to these tensions may result in an overemphasis on a single governance approach or one-sided objective. This can lead to poor cooperation, project fluctuations and even disruptions in the face of changes, and difficulty in flexibly bouncing from adverse conditions [10], hindering benefits realization.

Despite the importance of identifying these tensions, some research gaps still exist. Unlike tensions in repetitive and ongoing activities within permanent organizations [11], tensions in projects (as temporary organizing) exhibit diversity across different project phases [12]. Nevertheless, existing tension research predominantly concentrates on the project execution phase [7], neglecting the front-end and operation phases. Also, studies tend to examine single tensions in isolation, neglecting to explore their interwoven relationships [3, 13, 14]. More importantly, the multiple interwoven tensions are not static but are dynamically driven by responses to them. This dynamic interplay calls for a holistic perspective that integrates the interrelatedness and dynamics of these tensions, an area that still remains largely underexplored [15].

To deconstruct this holistic dynamic process, exploring responses and their influence is also indispensable. PM studies have proposed strategies regarding governance mechanisms, organizational capabilities, and partnering [16, 17], as well as "either-or" and "both-and" strategies from the paradox

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perspective [18]. Yet, these strategies only partially address tensions or only do so in particular contexts (e.g., relationships of owner-contractor, permanent-temporary organizations, and alliances) [19]. Responses to tensions between the project owner and the external project manager, and more critically, how these responses affect multiple tensions' evolution, remain to be explored systematically.

The purpose of this paper is thus to examine the tensions between the project owner and the external project manager throughout the project life cycle and how they customize response strategies. We raise the following questions:

1) Whether and, if so, what tensions emerge between the project owner and the project manager in benefits realization of public projects over the project life cycle?

2) What responses are implemented, and how do they influence the evolution of interrelated tensions?

We draw upon paradox theory to explore tensions, which offers a theoretical lens that allows for addressing conflicting demands or opposing perspectives simultaneously [20, 21]. Guided by this theory, this research can contribute to the project management literature by identifying tensions between the project owner and the project manager over the project life cycle. This is a complement to the prior focus on tensions between the project owner and supplier, and between the permanent and temporary organizations during the execution phase [12, 22, 23]. Second, this study enriches the application of paradox theory in project benefit realization by developing a holistic tension cycle [15, 24] that captures the interplay among multiple interrelated tensions under the influence of various responses. Third, this study can contribute to project benefits realization by exploring effective responses to paradoxical tensions from the paradox perspective.

The rest proceeds as follows. Section 2 presents the literature review on project life cycle and benefits realization, project owner-manager interactions, and paradoxical tensions in PM. It is followed by Section 3, which outlines the research methodology of interviewing and multiple-case study of public hospital projects. Sections 4 and 5 then describe the findings. The final three sections present discussion, implications, and conclusions.

II. LITERATURE REVIEW

A. Project life cycle and benefits realization

1) Phases and transitions over the project life cycle

The development of public projects goes through three phases, which are front-end, execution, and operation. These phases are interrelated, with the practices in each phase influencing those in the subsequent phases, either positively or negatively [8]. During the project front-end phase, the project owner's requirements are addressed through a project proposal and feasibility study, forming a business case. After appraisal by government sectors as project funders, the project progresses to the execution phase with conceptual (sketch) design, construction drawing, and construction, before transitioning to operation. Across these distinct phases, transitions occur from front-end to execution [25] incorporating benefit objectives into conceptual design through workshops [26], and from execution to operation [27, 28] involving activities like commissioning, training employees, and providing maintenance manuals [29].

2) Benefits realization

Benefits are defined as a flow of value that is triggered by the realization of a desired outcome [30, 31]. Benefits realization is examined from two levels [32, 33]. At the organizational level, benefits realization is explored for the project owner's strategic objectives and business success through the project investment [34]. At the project level, benefits realization is used to measure project success, including project short-term efficiency and long-term effectiveness [35, 36]. This project-level benefits realization process is led by the project owner and assisted by the project manager [35]. Owner-manager collaboration is thus of vital importance to project-level benefits realization.

B. Project owner-manager interactions for benefits realization

1) Interdependence between project owner and manager

The project owner and manager are two key players throughout the project life cycle [1, 37]. The project owner, typically an organization proposing new projects to enhance its abilities [38], often designs benefits propositions and develops the business case at the project front-end phase [2, 39]. Then a project manager is delegated to act on behalf of the owner to manage projects and deliver assets during the execution phase for future owner's operation [40]. This role is often referred to as project owner representative or "super project manager" [4, 41]. It could be an internal PM department within the owner in some cases [29], or an external PM firm when the owner lacks in-house PM capabilities due to intermittent nature of project investment activities [38, 42].

The project owner and manager are interdependent. The interdependence here is defined as "the reliance of one on the other" and accentuates "how work is coordinated over time" [43, p. 508]. On the one hand, the PM for benefits realization requires input from both the owner and the manager, as well as their intensive cooperation; on the other hand, PM tasks at different project phases are interdependent, since "a task cannot be commenced until another has been completed or unless another task is undertaken in parallel" [29, p. 148]. Specifically, the project owner's requirements propositions, project manager's PM execution, and the owner's asset operation are sequential and reciprocal.

Owner-manager interdependence for benefits realization runs throughout the project life cycle. At the front-end phase, the project owner may know what they want but not how to realize it through execution, while the project manager has more knowledge about execution but less about what the owner exactly wants. This asymmetry information requires owner-manager cooperation during the project front-end to develop accurate benefits propositions and the business case [26], reach a consensus on project requirements [44], and ensure the consistency between business case and project plan. Also, the project manager's expertise is crucial for assisting the owner. This owner-manager interdependence during the

project front end extends into the transition to the execution phase [7].

Furthermore, owner-manager negotiations, information exchange, and mutual adjustments are critical during the project execution phase [3, 43]. The project owner needs to approve necessary changes, maintain the project manager's morale, and understand the project process. For example, "any trade-offs between time/cost and benefits generation must be made in a dialogue" between the project owner and manager [1] (p. 514). Then to ensure coordination and continuity during the transition to the operation phase, the project manager can employ specialists with operation experience in the execution, and the owner can recruit experts from the PM team in the operation [45]. Even at the operation phase, the project manager can continue to support the owner in maintaining project assets [1].

Over the project life cycle, the owner-manager interdependence makes their goodwill cooperation and frequent negotiation critical to the benefits realization of public projects [46], particularly for external projects with communication obstacles across organizational boundaries.

2) Tensions between project owner and manager

Despite the importance of owner-manager cooperation for benefits realization, paradoxical tensions between them are ubiquitous. On the one hand, paradoxical tensions occur due to the principal-agent relationship between the project owner and the project manager. Empowerment to the project manager is required for a cooperative and flexible environment [47]. Control, however, is also essential for addressing agency problems (e.g., moral hazard and adverse selection problems), particularly between the project owner and the external project manager [7, 48]. Moreover, this control-empowerment tension is influenced by the temporal aspects of the past, present, and future [49]. For example, past negative collaborative experiences may lead to a sense of mistrust, potentially jeopardizing present collaborations and inducing more rigorous control. Besides, unclear owner-manager interfaces lead to accountability difficulties. For example, poor benefits realization arising from power struggles and target distortions within the owner may be mistakenly attributed to the project manager's faults [29].

On the other hand, the project owner and manager have divergent and even competing interests [50]. First, given the future's uncertainty and fluidity, the project manager tends to resist changes, preferring to freeze owner needs and minimize deviations from the planned costs and schedules. In contrast, the owner is concerned about evolving functions and long-term project operations [43]. Second, in public projects, project management (PM) focuses on both avoiding wasting scarce public resources through cost control [51] and ensuring the delivery of expected public services to taxpayers, i.e., project effectiveness. While the project manager is more inclined to control project costs even at the expense of project effectiveness, the owner prioritizes project effectiveness over cost control [1, 4].

Their contradictory requirements make paradox theory an appropriate perspective for analyzing tensions between the project owner and the project manager. Without proper identification and management of these paradoxical tensions, conflicts may arise at the owner-manager interface. This will lead to accountability shirking, work duplication or omission, and potential misalignment between initial objectives and achieved outcomes, ultimately undermining the project benefits realization.

C. Paradoxical tensions in project management

1) Complexity and dynamics of paradoxical tensions in project management

In paradox theory, paradoxical tension refers to "contradictory yet interrelated elements that exist simultaneously and persist over time" [20, p. 382], such as control versus flexibility. They could become salient under the conditions of changes or transformations [20]. They could be positive/generative or negative/pathological paradoxes [52], with the latter potentially leading to detrimental consequences.

Current literature identifies various types of paradoxical tensions across different contexts. In organization and management studies, initial research focused on organizational-level tensions, including those related to learning, organizing, belonging, and performing [20, 53]. Then tensions in the project context are gradually explored. Given the "temporary organizing" nature of projects, there are some overlaps between organizational and project tensions. Furthermore, the diversity, complexity, and uncertainty in projects, such as from various disturbances (e.g., disasters and pandemics), lead stakeholder organizations to confront many competing demands, such as short-term time pressure and long-term sustainability.

In the PM context, paradoxical tensions emerge at different levels, including individual, organizational, inter-organizational, project, and institutional levels, see Table I. From the inter-organizational perspective, studies focus on various paradoxical tensions of the three units. The first is the paradox of inter-organizational projects, such as competition-collaboration tensions between the project owner and suppliers [22], or among multiple internal and external stakeholders [12]. The second is the tension between the temporary and permanent organizations, such as knowledge creation-transfer [16], autonomy-embeddedness [54], innovation-persistence [23], short-term-long-term, efficiency-effectiveness, and urgency-patience [55]. The third is the paradox between the project owner and the project manager, which, although noted in some studies [3, 6, 7, 13], lacks a comprehensive and systemic exploration.

These tensions in project contexts are complex. Recent research, although limited, has explored the interrelationship between various tensions. Such interrelationship often entails that one pole of tension affects a corresponding pole of another tension [56]. For example, in humanitarian and development aid projects, inter-organizational performance tensions arise between social versus financial accountability [57]. They are intertwined with local versus global tension, individual versus collective tension, intra- versus inter-project

learning tension, and past versus present tension. Differently, in software development projects, inter-organizational performance tensions manifest as quality versus quantity, development time versus effort, and efficiency versus innovativeness [56]. They are interrelated with tensions of execution (e.g., rigid versus flexible), and structure (e.g., team homogeneity versus heterogeneity). Therefore, one size does not fit all when it comes to tension types and their interrelationships. Given the unique work tasks, cooperation methods, and inter-organizational relationships between project owners and managers [6], alongside their distinct benefit objectives [58], a systemic exploration into owner-manager tensions remains necessary.

Furthermore, the project context adds the complexity of the paradoxical tensions due to its multiple-phase nature. Unlike permanent organizations, which have stable structures and continuous activities, different project phases display unique characteristics [11]. For instance, the front-end phase prioritizes requirement definition, the execution phase focuses on timely delivery amid time pressures and emergent uncertainties, and the operation phase considers long-term usability [59]. Nevertheless, prior tension-related PM studies focus on the project execution phase, and only a few studies have begun to explore tensions at the front-end phase [12]. Given the interdependence between the project owner and project manager throughout the project life cycle, underexplored questions lie in whether and what tensions emerge at the project front-end, execution, and operation phases.

At the same time, these paradoxical tensions are dynamic. In project settings, organizations face multiple options, such as using control or trust as governance mechanisms [60], and collaboration and competition methods for competitive advantage [22]. Environmental changes may spur dilemmas, forcing decisions between opposing options, each with high costs as well as valued benefits [61]. Oscillating between these options will motivate a paradox lens. Depending on the frame, unilateral like a business case or ambivalent like a paradoxical frame [62], different responses will be adopted, leading to various outcomes. Despite this identification of dynamics, only a few management and organization studies investigate the dynamics of paradoxical tensions [15, 63]. Similarly, the evolution of tensions in inter-organizational projects, characterized by diverse tasks, goals, and a high degree of diversity, complexity, and uncertainty, remains to be fully understood.

Overall, a holistic approach is recommended for researching paradoxical tensions [15]. Since responses to one tension may potentially spark other tensions, it is necessary to integrate the interrelatedness and dynamics of multiple tensions [64].

TABLE I
PARADOXICAL TENSIONS IN ORGANIZATION AND MANAGEMENT LITERATURE

Research context	Theory	Methodology	Dimensions of paradoxical tensions	Refer-ences
Project network	Paradox theory	Literature review	At the project network level: 1) *Distance paradox:* attachment versus detachment; 2) *Learning paradox:* knowledge creation versus circulation; 3) *Identity paradox:* individual versus collective; 4) *Difference paradox:* standard procedures versus customized solutions; 5) *Temporal paradox.*	[49]
Project network	Performance feedback theory	Interview	At the project network level: distance, difference, identity, learning, temporal and performance paradoxes.	[57]
Large-scale project	Social balance theory	Multiple case study	At the inter-individual level: *Structural paradox, emotional paradox*, and *behavioral paradox*.	[65]
Megaprojects	Paradox theory	Literature review	At the inter-organizational level: *Stakeholder paradox*, *flexibility paradox*, *temporality paradox*, *structure paradox* (specialization-breath, autonomy-embeddedness, and power sharing-keeping), *learning paradox, decision-making paradox,* and *identity paradox.*	[66]
Sustainable construction projects	Paradox theory	Qualitative methodology with interview	*At the project level:* 1) The diverse temporal dimension of sustainable objectives; 2) The presence of organizational barriers; and 3) Lack of power; lack of knowledge on best practices; and lack of institutional support.	[67]
Sydney Opera House Project	Dialogical perspective and paradox theory	Case study	At the individual level of clients, engineers, and architects: 1) Value p*aradox*: personal touch versus formula-based solutions; ideation versus execution; 2) Organizing *paradox*: role ambiguity versus clarity; freedom versus autonomy; and 3) *Purpose paradox:* form versus function, idealism versus pragmatism.	[18]
Large-scale or institutional projects	Institutional theory	Case study	At the institutional level: 1) the industry reformation produced discursive spaces for renegotiation of the project actors' power and authority; 2) the owner-supplier relationship transfers between collaboration and competition in different institutional logic.	[9] [22]
Temporary organization in project context	Theory of paradox and temporary organizations	Case study, interview, or ethnographic study	Between temporal organization and the permanent organization:1) *Paradoxes between temporary and permanent organizations:* paradoxes of time, changes and stability, learning, project temporary structure and permanent organization; and 2) *Inter-institutional tensions*: temporal tensions and incompatibilities.	[55, 68, 69]
Innovation projects	Paradox theory	Qualitative methodology with interview	At the inter-organizational level: 1) Performing paradox (value creation versus capture); 2) Learning paradox (data sharing versus protection); 3) Organizing paradox (competition and collaboration); At the intra-organizational level: 1) Performing paradox (value creation for project versus for firm; risk-averse); 2) Learning paradox (decision-making processes and organizational culture);	[12]
Large infrastructure projects	Paradox theory and principal-agent theory	Case study	Between project owner and its project manager, between project owner and contractor, and between contractor and its project manager: control versus flexibility.	[13]

2) Responses to paradoxical tensions in project management

To address paradoxical tensions in PM, both PM studies and paradox studies have proposed response strategies. In PM studies, various management strategies have also been investigated in terms of governance mechanisms [16, 49], organizational capabilities [17, 66], and partnering [16]. For example, the learning paradox can be alleviated through a high frequency of interaction, trust, level of resource commitment, and long-term collaboration between the project owner and the project venture, as well as a high degree of absorptive capacity of the project owner [16]. Trust is not a panacea. Some studies suggested project owners prioritize trust and flexibility in a turbulent environment while emphasizing control in a more stable project setting [70]. Other response examples include innovative contract design, collective decision-making, and frequent inter-organizational communication for a tension equilibrium [71]. Despite efforts to address tensions between project owners and contractors, permanent and temporary organizations, or within multi-part alliances, the applicability of these strategies to tensions between project owners and external project managers has yet to be explored.

Furthermore, from the paradox perspective, responses to tensions in projects have been explored. They include: 1) "either-or", a defensive response, leading to a vicious cycle which means constant and even sharper push-pull at two poles

of tension; and 2) "both-and", an active response, leading to a virtuous cycle which is the tension's dynamic equilibrium [19, 64, 72]. The "either-or" logic treats contradictory opposites functioning independently, allowing for defense, separation, or privileging of one pole, thereby fueling vicious cycles. Some examples could be splitting, spatial or temporal separation, opposing or defending, and suppressing [21, 64, 73]. The "both-and" logic considers opposites inseparable and interdependent. In this situation, tensions are managed through paradoxical thinking, vacillation, or integration of separation and integration, maintaining an ongoing interplay of poles. For example, in the Sydney Opera House project, two strategies were proposed: a "both-and" strategy represented by a blended voice, and an "either-or" strategy characterized by a singular voice [18].

Given the varying applicability of the same strategy in different settings, further research deserves to investigate what responses are adopted and how various responses lead to the evolution of tensions between the project owner and the external project manager. At the same time, it is important to explore how the paradox perspective can contribute to the understanding and management of the paradoxical tensions in project benefits realization.

III. RESEARCH METHODS

A. Research design

We undertook qualitative research in the form of a case study to explore the multi-phase, dynamic, and interwoven owner-manager tensions in public projects [74]. The qualitative approach has been widely used in studies of socially-constructed paradox [15] since it allows for the analysis of complex and dynamic interactions [12, 75]. By engaging project participants' descriptions in interviews and archival documents, the reality of paradox can be constructed and reproduced. Also, qualitative studies can provide in-depth insight into dynamic processes, surface interrelated tensions, and depict the response strategies and tension cycle [74]. A case study is appropriate because it benefits directly focusing on the study's topic in a contemporary phenomenon [76], answering "how" and "why" questions [75], accurately describing constructs and their interrelationship, and facilitating theory building [77].

We selected China's public hospital project as the empirical context. China has a sizeable public construction project market where 14459.8 billion yuan [78] is invested annually on average between 2019 and 2023 [79]. Multiple PM modes have been explored, such as in-house within the project owner, market/contract-based outsourcing to an external PM firm, and government/noncontract-based outsourcing to an external state-owned PM enterprise [80].

In outsourcing modes, the external PM firm acts as the project owner representative, coordinating project owner and project team, and assuming higher management authority over contractors and consultants. In 2004, to compensate for the owner's insufficient PM capabilities, a PM mode (agent-construction system or Chinese Dai Jian Zhi) was advocated for public projects to engage a for-profit PM firm from the market [81], private or state-owned. A service contract would govern the PM firm's conduct from project execution to delivery and specify the service fee obtained from the owner. Later, several cities explored a noncontract-based outsourcing mode. In this mode, state-owned PM enterprises acted as the government's so-called "platform enterprises" and were designated by the government to perform the function of delivering local public construction projects [82]. These PM enterprises are mostly not-for-profit. They are involved in projects from the project front-end phase until the delivery. More daily decision-making rights were transferred from the owner to the PM enterprise. Significant tensions arose between the project owner and the external PM firm, particularly at the onset of the government's enforcement of the transformation from in-house and contract-based outsourcing to noncontract-based outsourcing. In these cities, along with this transformation of PM modes, more state-owned PM enterprises dominate the provision of PM services in Chinese public construction projects.

In practice, notable owner-manager tensions emerged in public hospital projects due to project complexity and uncertainty [83], manifested in owner requirements from multi-specializations (e.g., dentistry, gynecology, pediatrics, and traditional Chinese medicine) and multi-discipline (e.g., internal medicine, surgery, medical imageology, and pharmaceutics), and uncertainties associated with future medical technology advancement and demographic changes.

In this context, three hospital project cases in Table II were chosen based on four reasons. First, these cases are riddled with tensions, recommended by local government officials. Second, following the replication logic [84], all project owners outsourced PM services to external project managers, rather than in-house. This helped in focusing attention on the evolution of inter-organizational owner-manager tensions, which differed from intra-organizational tensions in terms of actors' cultures, structures, and conducts. Also, we considered both contract-based and noncontract-based PM outsourcing modes, where the project owner and PM firms performed differently, for a comparative exploration of the effect of PM mode transformation. Third, these cases were related to different specializations within public hospital projects, including dental hospital, government institutional hospital, and women's and children's hospital. This supported a deep identification of more inclusive tensions in owner-manager interactions. Fourth, when we collected data, these three projects were in different phases: case 3 had just transitioned from the front end to the execution phase; case 2 was at the middle of the execution phase; and case 1 was at the operation phase. In this way, we could examine various tensions at three distinct project phases. At the same time, given that different cases may prefer one pole of the tension over the other, cross-case comparison can clearly reveal the oscillation between the two poles of tension.

This research builds on the previously developed theory and pays attention to the evolution process of paradoxical tensions between project owner and manager in the public project setting. Through this research, we expect to contribute to an in-depth understanding of the project tension.

TABLE II
DESCRIPTION OF THE THREE CASES

Information	Case 1: Extended medical complex project	Case 2: Renovation of medical complex project	Case 3: Parking garage project
Description and status	Construction contents include outpatient, medical technology, purification operating theatres, wards, and offices. At the time of investigation, the project was in operation.	Construction contents include the decoration of wards, outpatient, office areas; and the renovation of multiple systems of new technologies. At the time of investigation, the project was at the middle of the execution phases.	Construction contents include a car park with 856 parking spaces. At the time of investigation, the project had finished the front-end work and entered the initial execution phase.
PM mode	Market/contract-based outsourcing.	Government/noncontract-based outsourcing.	Government/noncontract-based outsourcing.
The project owner and its involvement phases	Dental hospital, involves during the project life cycle.	Institution hospital, involves during the project life cycle.	Women's and children's hospital, involves during the project life cycle.
The project manager and its involvement phases	State-owned and for-profit PM enterprise, participates from the project execution phase until the final handover of the project asset.	State-owned and not-for-profit PM enterprise, begins to participate after the project's flexibility study and works from the project's initial design to asset handover.	State-owned and not-for-profit PM enterprise, participates after the project proposal at the front-end phase until the final handover.
Duration	4 years (2013-2017).	3.25 years (2018.09-2021.12).	3.5years (2020.06-2023.12 as expected).
Budget	RMB 250 million, fully funded by the hospital's own funds; the final is RMB 638.56 million.	RMB 63.29 million, fully funded by the Treasury funds; the final is RMB 62 million.	RMB 280 million, funded by the Treasury funds and the hospital's own funds (25:3).

B. Data collection

1) First-stage archival data, field survey, and interview

The first-stage wide probe aimed to uncover typical and divergent tensions and how different response strategies influence tensions. Initially, we collected archival data, such as policy documents and literature, across China. For example, we reviewed and analyzed influential publications on innovative PM practices in public projects in Shanghai, where the PM of public hospitals is widely recognized as successful due to the establishment of a unique public organization responsible for the simultaneous management of all local hospitals and a dedicated hospital PM enterprise.

Then, we conducted a field survey to learn about advanced PM practices in public projects in Shenzhen, China in June 2019. Employees of the Housing and Construction Bureau of Shenzhen provided an overview of their PM practices and facilitated a site visit.

Next, through the interviews between April 2019 and October 2020, we collected data about owner-manager interactions in different cities of Jiangsu province. The construction industry in this region serves as a representative example in China, characterized by its extensive building volume and multifarious PM practices. Also, Jiangsu province is at the forefront of PM reform in public projects in China, transitioning from in-house and market to government outsourcing, yet significantly constrained by owner-manager conflicts. In this process, we interviewed 17 government officials and 33 senior managers from PM enterprises (Table 3). They all held extensive experience and accumulated lessons in owner-manager interactions (as holders of key positions in their respective professional organizations).

This interview data collection included individual and group interviews for comprehensive data. The initial group of interviewees was selected through the authors' social network, and additional interviewees were chosen through a snowball sampling method, relying on suggestions from the initial group. Given our limited understanding of the practice at the time and the critical positions of these interviewees, we conducted longer interviews with them to gain insights into the practice, such as the evolution of PM modes and the existing tensions. With increasing understanding of the practice, interviews became more target-specific, shortening the interview duration.

Furthermore, we carried out group interviews to facilitate the emergence of data related to tensions. It is different from a focus group discussion because the researcher took turns interviewing interviewees, not all interviewees interacted and debated freely [85]. Despite this, participants can build on others' responses to further elaborate on their own similar or differing viewpoints. Given that the participants—leaders from government sectors and project management enterprises across various cities—faced constraints due to their administrative roles, individual and private interviews were impractical. Therefore, group interviews, orchestrated by superiors and held in a public setting, proved to be a more effective option. For example, with the support of a senior government official, we interviewed interviewees #4 to #33 from multiple cities across Jiangsu province over two days. They were suggested to consider the questions and draft a report reflecting their insights beforehand. We subsequently received 21 reports. During the interviews, participants efficiently presented major PM challenges based on their diverse backgrounds. Following the interviews, we further verified with them the vague issues they mentioned in their reports and interviews. Besides, local policy documents about PM in public projects were carefully analyzed to understand the local institutional context and support the interviewees' statements. Ultimately, group interviews were instrumental in identifying various tensions and responses.

2) Second-stage interview

Based on three public hospital project cases, the second-stage interview was conducted from December 2017 to December 2021. Three cases included a dental hospital project, an institution hospital project, and a women's and children's hospital project in Jiangsu province. Their project managers all became involved in PM after the project proposal was proposed but before the project execution phase began.

Semi-structured interviews were implemented, given the advantages of direct focus on the research topic and causal inference of perceptions [86]. The interviewees were employees directly involved in the owners and managers of the three project cases, detailed in Table III. We primarily conducted face-to-face interviews, supplemented by telephone or online interactions, to elicit "the participant's experiences, perceptions, thoughts and feelings" [86, p. 12]. The interview topic was how the project owner and manager interacted over the project life cycle, if they met any difficulties, and how to respond. With the interviewees' consent, audiotaped interviews were transcribed verbatim immediately after the interview for further coding analysis.

A data set of related secondary data was also collected from publicly available and internally published sources, including

policy reports, project summary documents, and web pages. They were used to contextualize the institutional environment, sort out the owner-manager interaction process, and interpret the interview data. At last, all field notes and transcriptions were inputted into NVivo software.

TABLE III
PROFILE OF INTERVIEWEES

NO.	Organization		Interview dates	Duration (min)
1	Government official	Government Construction Sector	10/15/2019-9/28/2020	494 Ind.
2	Government official	Government Construction Sector	11/27/2019-9/28/2020	150 Ind.
3	Government official	Government Construction Sector	9/28/2020	32 Ind.
4-7	Government official	Government Construction Sector	10/20/2020	45 Gro.
8-13	Project manager	Construction management agencies from five cities		
14-23	Government official	Government Construction Sector	10/21/2020	55 Gro.
24-33	Project manager	Construction management agencies from nine cities		
34-36	Project manager	Enterprise of state-subsidized housing	8/19/2020	90 Gro.
37-40	Project manager	Construction management agency		
41-43	Project manager	Enterprise of urban construction		
44-46	Project manager	Construction management agency	9/4/2020	110 Gro.
47-49	Project manager	Construction management agency	9/10/2020	95 Gro.
50	Project manager	Construction management agency	4/16/2019 6/11/2019	165 Ind.
51*	Project manager	Agent construction firm (case 1)	12/28/2021	82 Ind.
52*	Project manager	Construction management agency (case 2)	5/27/2021	51 Ind.
53*	Project manager	Construction management agency (case 3)	5/28/2021	46 Ind.
54*	Project manager	Construction management agency (case 3)	5/28/2021	40 Ind.
55*	Project owner	Dental Hospital (case 1)	12/27/2017	52 Ind.
56*	Project owner	Dental Hospital (case 1)	1/9/2018	67 Ind.
57*	Project owner	Dental Hospital (case 1)	5/25/2021	87 Ind.
58*	Project owner	Institution Hospital (case 2)	5/27/2021	52 Ind.
59*	Project owner	Women's and Children's Hospital (case 3)	12/15/2021	87 Ind.

C. Data analysis

Considering the research question regarding the dynamic evolution of paradox between the project owner and manager, the unit of analysis focused on their interactions, such as "discourses, social interaction processes, and ongoing organizational practices" [72, p.77].

Based on the collected data, two separate analysis processes were carried out to investigate the multi-stage tensions and responses. The analysis followed the abductive logic, which advocates "going back and forth" between theory and practice [87]. This approach was chosen for two main reasons. First, there are established concepts/dimensions of tensions and response in paradox theory, which are, however, not well contextualized in the benefits realization of public projects. For example, various tensions have been identified, with partial overlap across different research contexts, such as organizational, temporary-permanent organization, and inter-institutional contexts. An abductive analysis facilitates the exploration of more nuanced evidence and prevents reinventing the concept wheel. Second, prior studies on paradoxes across diverse contexts have effectively utilized the abductive approach, demonstrating its utility and effectiveness [12, 64, 88].

The data analysis and data collection proceeded in tandem [77]. The data collection process ceased when 1) the current concepts and themes were well established and validated, and 2) no new concepts or themes emerged to complement the data structure in subsequent interviews [89].

First, based on the data, we aimed to identify the types of tensions between project owners and project managers during three project phases. We began by recursively reading the interview data to identify the descriptions of organizational actors experiencing "stress, anxiety, discomfort, or tightness in making choices and moving forward in organizational situations" [72, p. 68]. Descriptions that were repeatedly mentioned by informants were noted as the first-order concept in NVivo software, which portrayed our informants' experiences, expressions, and views.

Through constantly comparing and relating first-order concepts, we identified second-order themes that bridge specific events with theoretical tension concepts in the existing paradox literature [90]. For example, first-order concepts related to the competing demands of standardized management versus owners' customized needs align with the "standard procedures versus customized solutions" tension proposed by DeFillippi and Sydow [49]. Thus, these first-order concepts were grouped under the second-order theme "tension between standardization-customization". The validity of this coding process was ensured through the recursive discussion and refinement among the three authors in this research.

Aggregate dimensions were then developed from the second-order themes by continuously aligning them with existing paradox frameworks [91], such as: 1) Smith and Lewis [20], which outline performing, belonging, organizing, and learning paradoxes; 2) DeFillippi and Sydow [49] and Angeli, et al. [57], which address paradoxes related to distance, difference, identity, learning, temporal, and performance; and 3) Wiewiora and Desouza [66], which focus on stakeholder, flexibility, temporality, and structure paradoxes. Finally, we identified performance, organizing, and structure dimensions, as shown in Fig. 1. Although the unique and detailed practices classified under these dimensions in this study differ from those in previous research [20, 66], the data consistently align with the existing aggregate dimensions. As a result, there is no need to establish new dimensions. Also, the names of these three theoretical dimensions, lacking specific empirical content, help to "diminish the risk that the data are 'forced'" [90, p.149].

These three dimensions, including performance, organizing, and structure tensions, are grounded in theory and practice. In this research context, this taxonomy supports the notion that project benefits (efficiency-effectiveness) are influenced and realized through the daily implementations of organizations (empowerment and control, and standardization-customization) within a specific structure (attachment-detachment).

During the coding process, we observed that these tensions consistently emerged in the data of three project stages. To explore the evolvement process of tensions over the project life cycle, first-order concepts were grouped into the front-end, execution, and operation phases from the temporal perspective, see Table IV. Simultaneously, how these tensions interrelated and emerged within each project phase was investigated. The quotes from informants, i.e., first-order concepts, were numbered with the format of α-β. In this

numbering system, α represents the project stages (1 for front-end, 2 for execution, and 3 for operation), while β denotes its sequential appearance in the research findings.

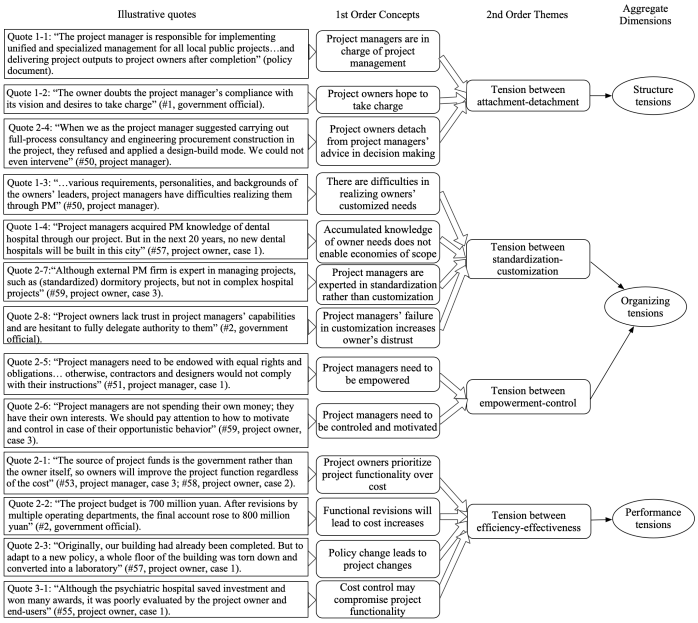

Fig. 1. Data structure of project tensions

TABLE IV
ILLUSTRATIVE QUOTES ABOUT TENSIONS OVER THE PROJECT LIFE CYCLE

Project phases	Type of tensions	Quote No.
Project front-end phase	Attachment-detachment	1-1, 1-2
	Standardization-customization	1-3, 1-4
Project execution phase	Efficiency-effectiveness	2-1, 2-2, 2-3
	Attachment-detachment	2-4
	Empowerment and control	2-5, 2-6
	Standardization-customization	2-7, 2-8
Project operation phase	Efficiency-effectiveness	3-1

Second, our goal was to investigate the responses to tensions. When performing coding on all data, we focused on the actions or attitudes exhibited by project owners and managers in response to tensions. When descriptions of a particular response from informants emerged repeatedly during the ongoing process of data collection and analysis, we noted the response as a first-order concept. To differentiate from the labelled numbers of identified tensions, the responses were labeled using the format Rγ, where γ represents the sequential appearance order in research findings. Among first-order concepts, a response could be relevant to multiple tensions. Similar to the above tension coding approach, we related and compared the first-order concepts. Second-order themes were then developed by drawing on both specific events and theoretical concepts in paradox theory. Based on existing response frameworks in paradox literature, according to the positive or negative outcomes of the responses [19, 64, 72], we grouped the responses into defensive and active responses in this project context, see Fig. 2.

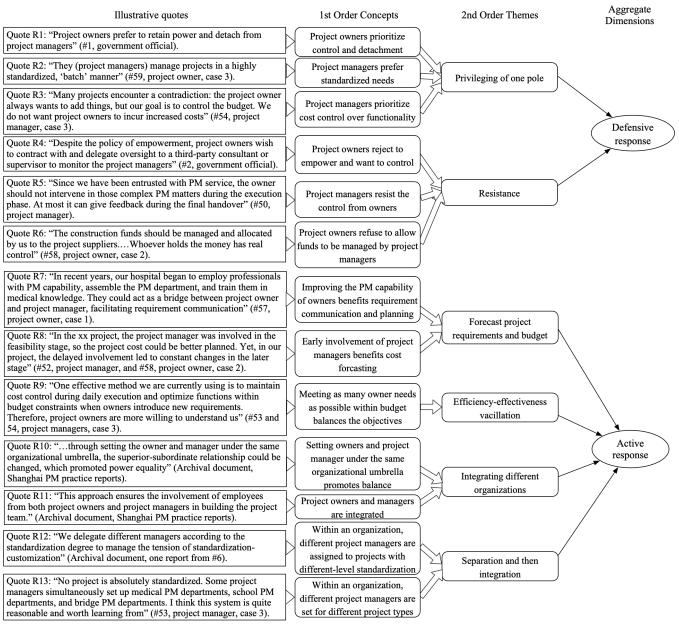

Fig. 2. Data structure of responses to project tensions

Third, we aimed to examine the evolution of tensions by connecting tensions and responses. Based on the data, we found that the salience of tensions occurs simultaneously with the response to it. When tensions became perceived and defensive responses were adopted, the interrelationships among tensions were activated and contributed to the formation of a holistic multi-tension cycle. Differently, active responses could reduce the tension triggers or promote the balance between poles. In this case, two poles within another related tension were influenced equally by one tension, thereby breaking the salience transfer and leading to a temporary balance.

In the investigated cases, tensions that produced a negative influence on benefits realization were caused by organizations using defensive reactions to cope with them. Although some active responses were found, in practice tension is not always addressed actively. Therefore, to depict the evolution of multiple tensions, this study will illustrate the dynamic tension cycle under the influence of defensive responses in Section 4, as well as active responses and their influence in Section 5.

IV. EVOLUTION OF TENSIONS DRIVEN BY DEFENSIVE RESPONSES

The findings regarding tensions between project owners and managers were organized into four distinct types. The first type, efficiency-effectiveness tensions, addressed the conflicting objectives between the project owner and manager. The second and third types focused on the varying degrees to which project managers were empowered or controlled, either through standardized or customized approaches, to manage projects in collaboration with project owners. The fourth type, attachment-detachment tensions, explored the dynamics of power-sharing versus power-keeping within project organizational structure design. These four types of tensions arose over the project life cycle, supported by the quotes in

Fig. 1. Defensive responses to these tensions, including privileging one pole or resistance, often influenced other tensions, leading to their co-evolution. From the project front-end, execution, to operation phases, how these tensions unfolded between the project owner and the manager was presented as follows.

A. Tensions during project front-end phase

Attachment-detachment tension kicked off the prelude to owner-manager tensions. As a result of limited in-house PM capabilities and government institutional mandates, the project owner needed to choose an external project manager and share the decision-making rights in this research context (Quote 1-1). Notwithstanding, the owner also desired to retain all project powers within their organization (Quote 1-2). The owner faced a dilemma on attachment-detachment about delegating the external project manager.

Attachment-detachment tension became salient during the transformation of PM modes institutionally. For case 2 and case 3, when the PM mode changed from in-house and contract-based outsourcing to noncontract-based outsourcing, the "*attachment*" of project managers was encouraged. Especially at the outset of PM mode transformation, project managers fully dominated the project execution phase. This spurred the resistance of project owners with vested interests (such as decision-making rights) and a desire for "*detachment*" (Quote R1).

Furthermore, project owners' preference for detachment is related to *standardization-customization tension*. Standardization-customization tension was revealed since the involvement of the project manager in the later phase during the project front-end phase. By managing multiple projects and accumulating PM experience, project managers could optimize standardized PM procedures by exploiting existing knowledge, leading to reduced costs, shorter timelines, and higher-quality project delivery. However, when facing highly specialized, complex, and individualized requirements from owners in different specializations, such as in the dental or psychiatric fields, the tension of standardization-customization became salient. Learning the operational knowledge of a new industry or specialization was costly and might not apply to other projects, potentially demotivating project managers from pursuing customization (Quotes 1-3, 1-4, and R2). This situation was considered a reason why project owners adopted a resistant attitude and opted for "*detachment*" to facilitate *customization*. However, project owners' customized requirements may not comply with *standard* procedures and could lead to inaccurate budgets. This increased the project manager's pressure to control the cost during the following execution phase. Interviewees from project managers indicated that their early involvement or *attachment* often helped reduce these errors.

Overall, spurred by institutional change, tensions of attachment-detachment and standardization-customization co-existed and interacted at the project front-end stage. Privileging and resistance responses were persistent.

B. Tensions during project execution phase

Entering the execution phase, *efficiency-effectiveness tension* arose between the project manager and project owner due to their divergent focus on project benefits realization. The project manager focused on the timely and budgeted delivery of project assets, even at the cost of project function effectiveness, driven by contractual obligations, policies, and regulations. In contrast, the public project owner prioritized project long-term effectiveness over efficiency (Quote 2-1), as their primary responsibility lay in operating projects for quality public service delivery.

Efficiency-effectiveness tension became salient during making decisions between competing value(s). For example, when the owner's new operating requirements led to cost and schedule overruns, requiring additional efforts from project managers (Quotes 2-2 and 2-3) or when facing a contracting plan selection, project owners and project managers might have different opinions. This could further intensify *attachment-detachment tension* (Quote 2-4). As project managers increasingly privileged *efficiency* over effectiveness (Quote R3), the owners' preference for the *detachment* pole intensified. Although this e*fficiency-effectiveness* tension typically emerged during the uncertainty-filled execution phase, anticipating such tensions had influenced project owners' preference about whether to *detach* project managers from the project front end.

When owners were keen to keep power and remained *detached* from project managers' involvement, or when they distrusted project managers to prioritize their interests, it stimulated *empowerment-control tension*. Although the owner should empower adequate decision-making rights to ensure effective on-site management (Quote 2-5), uncertainty about managers' alignment with their interests often led to increased control (Quote 2-6).

To enhance *control*, some owners expressed their desire to delegate a third-party consultant to monitor the project manager during the project execution phase, although this was not executed due to policy constraints (Quote R4). Under the control, the project manager often resisted (Quote R5). Therefore, the project owner and manager competed for rights over construction funds management for their own more control rights and flexibility (Quote R6). The resistance from project owners further drove their preference for *detachment*, while the resistance from project managers was to remain *attached* and *empowered*.

With an intensified emphasis on *control and detachment*, experienced project owners become more actively engaged in projects to fulfill their *customized* needs. For example, a respondent said, "We owners lost decision rights in projects. I do not think the delivered project would be operated smoothly without our participation at the project execution phase." (#59, project owner, case 3).

On the other hand, the more *attached* project managers were, the easier it was for them to meet their preferred *efficiency* goals and the stronger their *standardization* of PM routines became. Also, the weaker *customization* might

increase owners' distrust and *control* over managers (Quotes 2-7 and 2-8), thereby fueling the entire cycle of multiple tensions and frequent inter-organizational conflicts.

Therefore, during the execution stage, all four types of tensions were prominent and interacted with each other, influenced continuously by front-end tensions, triggered by environmental changes, and spurred by defensive responses.

C. Tensions during project operation phase

Post-construction, the performance tension on *efficiency-effectiveness* persisted due to inaccurate front-end value definition or poor execution management. A respondent stated an example of excellent cost control but poor operation function realization in another local typical case (not included in this research's three cases) (Quote 3-1). At the same time, a debate arose regarding whether the perceived ineffectiveness noted by owners should be attributed to poor execution by project managers or to the owners' unclear expressions and frequent additions of requirements. Overall, the limited involvement of project managers during the operation phase led to fewer interactions and reduced tensions with owners. Most tensions during this stage stemmed from the lingering effects of the previous two stages.

Conclusively, these four types of tensions were distributed in different project phases, as shown in Fig. 3. Between the project owner and manager, tensions of attachment-detachment happened from the project front-end phase until the project delivery. Tensions of standardization-customization emerged from project managers' involvement until project handover. Tensions of efficiency-effectiveness were identified during the execution and operation phases. Tensions of empowerment-control were intensively manifested during the project execution phase. Tensions influence each other across phases.

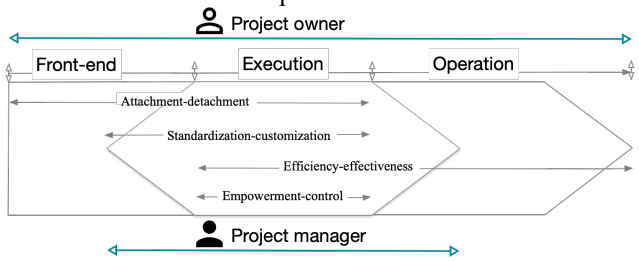

Fig. 3. Paradoxical tensions between project owner and manager over the project life cycle

V. ACTIVE RESPONSES

To address the potential negative influence of tensions spurred by the above privileging and resistance responses, some active responses have been implemented in practice and proven effective. In the studied cases, the transition from defensive responses to active responses occurred as the project manager persisted in facing pressure from the project owner. The leadership within the project manager took the initiative to encourage their teams to shift their mindset and actively engage with the project owners' perspectives.

1) Improving forecast accuracy on owner's requirements and project budget

To tackle the *efficiency-effectiveness* tension, predicting project requirements and budget at the front-end phase was an effective strategy to balance the two opposites. The project owner could recruit employees with PM expertise (Quote R7). Additionally, practices evidenced that involving project managers early on helped integrate the project management and operation capabilities of the project manager and owner. This enhanced accurate prediction and fulfillment of owner requirements and efficiency goals, including cost and schedule adherence, leading to fewer project changes which could trigger the salience of *efficiency-effectiveness* tension during execution phases (Quote R8). The perception of divergence between standardization and customization was reduced. Furthermore, this reduction in disagreement resulted in fewer disputes arising from power struggles, notably those related to *empowerment-control* and *detachment-attachment tensions*.

2) Vacillation between efficiency and effectiveness

Another strategy, the vacillation between *efficiency and effectiveness,* had been explored by the project manager. In daily management, the project manager managed project efficiency objectives through PM techniques. When the owner's new requirements were proposed during the execution phases, the project manager would maximize the owner's effectiveness objectives within budget constraints (Quote R9). According to comments of project managers from cases 2 and 3, this vacillation strategy boosted owner satisfaction, decreased control/detachment that was originally intensified, and facilitated the realization of consensual project benefits.

3) Integrating different organizations into a novel organization

Another strategy for addressing owner-manager tensions involved adjusting the organizational structure and establishing a novel state-owned organization. This higher-level organization oversaw both the project owner and manager, eliminating the superior-subordinate relationship and promoting equality (Quote R10). They formed a PM team to execute a specific project (Quote R11). This same organizational umbrella could integrate project management and operation expertise, and inter-organizational structure. Between the project owner and manager, paradoxical opposites in *empowerment-control*, *standardization-customization,* and *attachment-detachment* could thus be alleviated to some extent. This practice was adopted to integrate a PM firm and all local public hospitals under the leadership of a higher-level organization in Shanghai, China. This strategy was stated as "very clever" (#53, project manager, case 3) and "worth learning" (#57, case 1, #58, case 2, and #59, case 3, three project owners). By adjusting the owner-manager organizational structure, this strategy could enhance the realization of project benefits.

4) Separation and then integration

A strategy of separation and then integration was detected to manage the tension of *standardization-customization*. One example adopted by some cities was a dual-track model. That is, for projects with a high degree of standardization, general project managers could be entrusted; for projects with a low degree of standardization and a high degree of personalization,

the delegated managers were good at PM in the specific operation industry (Quote R12).

Another practice was functional specification, where the project manager formed different departments related to medical care, education, transportation, and others (Quote R13). Personnel from different departments were responsible for the corresponding professional types of projects. Employees who grasped both project management and operation knowledge of a specific industry could balance the standardization and customization for project benefits realization. As a respondent said, "When only keep managing women's and children's hospital projects repeatedly, the more you do, the easier it is" (#59, project owner, case 3). Correspondingly, as trust in the project manager's capabilities grew, the project owner's need for increased control/detachment gradually decreased.

In conclusion, these active responses could be related to the partner's early involvement, organizational capability (including vacillation and integration), and novel organizational structure. They could alleviate the salience of tensions through two mechanisms: 1) reducing triggers of tension, such as changes; and 2) balancing both poles rather than privileging one, such as vacillation and integration, which not only diminishes the salience of one tension but also prevents the activation of another.

VI. Discussion

This study identified four types of paradoxical tensions across performance, structure, and organizing dimensions, as perceived by project owners and external project managers at three project phases. These dimensions partly overlap with those identified in previous studies on permanent organizations and project contexts [20, 49, 57, 66], highlighting their widespread relevance across different levels and contexts. This study establishes a theoretical framework for understanding paradoxes in the benefits realization of public projects. During the execution stage, all four types of tensions are salient, including efficiency-effectiveness, standardization-customization, detachment-attachment, and empowerment-control. Differently, during the front-end stage, efficiency-effectiveness and empowerment-control tensions are not perceived, likely due to minimal power inequality, limited project outcomes, and undefined target constraints, which reduce competition for power, resources, and benefits [92]. During the operation stage, with limited inter-organizational interactions, only tensions of efficiency versus effectiveness are evident, influenced by the lingering effects of the previous stages.

This focus on tensions of the project life cycle provides new sights into the front-end and operation phases, complementing prior studies that consider inter-organizational tensions only arise during the execution phase [12]. At the same time, these tensions influence each other across phases. For example, the efficiency-effectiveness tension extends its impact forward, influencing organizational front-end decisions on structural design (detachment-attachment), and backward, affecting the final outcomes and accountability traceability during the operation phase.

These tensions are knotted, driven by two types of defensive responses: privileging and resistance responses, see Fig. 4. Each tension may initially become salient and subsequently influence other associated tensions, forming a cycle. Take the knotting relationship between standardization-customization and detachment-attachment as an example. When the pole of standardization is privileged over customization, project owners may respond with resistance and detach project managers from projects. In this way, privileging the detachment pole could intensify the customization pole. However, an abundance of customized requirements may provoke resistance and attachment from project managers who adhere to standardized procedures. This offers a plausible explanation for the inter-tension knotting cycle [93], i.e., being formed by the contrasting impacts of these two responses. Furthermore, the cycle of knotted tensions could manifest as not only pairs but also more intricate configurations such as trefoil or quatrefoil knots, as evidenced in this research's findings.

On the one hand, this dynamic cycle process involving multiple tensions extends beyond the traditional focus on the cyclical nature of a single tension, where opposing poles act as triggers for one another [24]. On the other hand, this could complement existing research on how the interplay between the poles of one tension and those of another drives the evolution of these tensions [88]. This study could thus respond to the call for a holistic dynamic tension study [15].

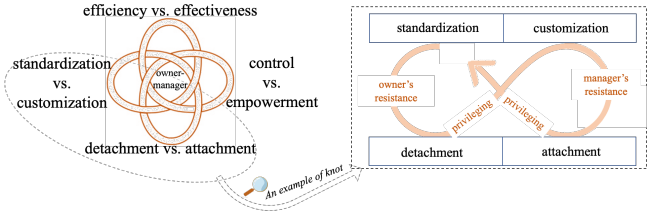

Fig. 4. Knotting relationships of paradoxical tensions between project owner and manager

Compared with the vicious cycle spurred by defensive responses, active responses promote a temporary balance that persists until the next defensive response is adopted. This research identifies four active response methods that can lead to a balance of tensions within project contexts. These methods are categorized into two types: The first involves synthesis, vacillation, and paradoxical thinking [67], which, despite being widely discussed in tension studies, manifest differently across various research settings. The second type aims to minimize triggers or environmental changes, such as predictable risks. An active response that mitigates one type of tension also correspondingly diminishes its stimulation of other tensions, further helping to break the vicious cycle of tensions.

1) For the efficiency-effectiveness tension, the first strategy is to improve forecast accuracy on front-end requirements and budgets by project owners' recruiting employees with PM expertise or project managers' early involvement. The second

is to vacillate between efficiency and effectiveness goals for project benefits realization. This could supplement prior studies on aligning competing goals by establishing a consensus and identification [94, 95], and a relational contracting [96].

2) For empowerment-control and attachment-detachment tensions, a possible strategy is to set the project owner and manager under the umbrella of the same higher administrative organization. Additionally, establishing a partnering relationship or integrated PM team is advised by some respondents to tackle these prevalent tensions. These can be related to the strategy of elevating the level of analysis [14].

3) For standardization-customization tension, the importance of integrating project management and operation knowledge is stressed. Setting project owners and managers under the same novel organization could realize a balance. Another active strategy could be separation and then integration, such as a dual-track model or functional specialization.

These strategies contribute to project benefits realization from a paradox perspective, and complement prior studies on responses to project tensions, such as governance and coordination mechanisms [49].

Critically, the shift from defensive to active responses relies on a top-to-bottom change in mindset and behavior within one organization, subsequently alleviating tensions between the two organizations. This parallels with the responses to intra-organizational tensions, highlighting the significance of cognitive and behavioral complexity within leadership [97]. Leadership, on the one hand, shapes the organization's goals [98], and on the other hand, it can deconstruct and reframe tension at a higher level of analysis for its members [64].

VII. Implications for Research and Practices

This research contributes to the body of knowledge in three ways. First, it extends PM literature by investigating tensions between the project owner and the project owner' manager. Their inter-organizational tensions differ from the tensions between the project owner and supplier or between the temporary and permanent organizations in prior studies [22, 23]. Moving beyond the traditional focus on the execution phase [12], this research identified four types of knotted tensions in owner-manager interactions during the project front-end, execution, and operation phases.

Second, this study advances the application of paradox theory in project benefits realization by illustrating the holistic, systemic, and dynamic cycle among multiple interrelated paradoxical tensions. This provides an appropriate perspective to examine the various competing demands among the key actors in project benefits realization. It identified the evolution of multiple tensions and responses, which facilitates the holistic tension cycle. A defensive response to tension serves as an amplifier between this tension and another, while an active response functions as a mitigator. This exploration moves beyond the traditional analysis of single tension cycles, static interrelationships, and merely naming tensions [24, 56]. Rather, it responds to the call for an integrative approach to explore cyclical dynamics across interwoven tensions [15, 24].

The third contribution of this research identifies strategies for project benefits realization by coping with owner-manager tensions. On the one hand, by analyzing both defensive and active responses to tensions, this study accentuates the importance of organizational leadership in the transition from defensive to active approaches for tension balance. This finding in the project context is consistent with that in the permanent organization context [64]. On the other hand, we empirically show how four specific active responses are applied to address tensions by either reducing triggers or balancing poles. They involve the partner's early involvement, organizational capability (including vacillation and integration), and novel organizational structure. This research thus helps project benefits realization [1, 99] by showing improvement strategies derived from paradox theory.

Furthermore, this research has implications for wider research, such as project resilience. Resilience reflects a characteristic of a system (e.g., project as a temporary organizing) to adapt to adversity or perform under variations, maintain positive adjustment, and return to equilibrium in the face of long-term complexity, change, uncertainty, or adversity [100-102]. Examining and addressing paradoxes may be inspiring for improving project resilience in complex and rapidly changing environments [10, 103, 104].

This study also provides some managerial implications. First, the project owner and manager could be aware of the objectivity of tension existence and actively cooperate in dealing with them. Facing efficiency-effectiveness tensions due to competing goals or interests, they should put more effort into budget prediction, improve requirements communication, and vacillate between goals. For example, project managers can participate at the project front-end, collect owner requirements, and aid in budget prediction. They can control project costs and schedules in daily management, and strive to meet the owner's needs within the allocated budget when facing project changes.

Second, facing tensions, resistance and privileging one pole will worsen things. We suggest that organizational leadership, especially within the project manager, should embrace paradoxical thinking, adjust mindset, and guide the project team in adopting active responses to tensions. Of course, addressing tensions for project benefits realization relies on both the project manager and the project owner. They can agree on responsibility and collaboration, form an integrated PM, establish a partnering relationship, or have a common parent organization. For example, they can share office space, and their leadership can collaborate in a committee to make decisions collectively. Besides, when the project manager feels pressure to balance standardization and customization of needs, they could also set up different professional departments in different industries, such as the hospital project department and the school project department.

CONCLUSION

The findings in this research address three gaps in the present project management literature. First, they focus on tensions between the project owner and the project owner's manager, both of which play important roles in project benefits realization. This complements prior studies on tensions between the project owner and suppliers, between different suppliers, and between the temporary and permanent organization. Second, the findings present four types of tensions during the project front-end, execution, and operation phases, beyond the prior studies' focus on the execution phase. These tensions include detachment-attachment, effectiveness-efficiency, empowerment-control, and standardization-customization. Third, this research depicts the evolution of multiple tensions, spurred by various response strategies. Consistent with prior studies, it shows that a defensive strategy often leads to a vicious cycle of tension, while an active strategy fosters balance. Differently, through studying the evolution of multiple tensions, this research reveals that when one tension changes due to one response, other tensions will also be influenced.

This research is not without limitations which should be addressed by further research. First, tensions in this research are identified in China's public construction project context, influenced by its unique political and economic background. For example, in this study, project managers are from for-profit and not-for-profit state-owned enterprises, which dominate China's public construction projects. However, tensions and responses may vary if project managers are for-profit private enterprises in other countries. Future research is recommended to compare state-owned and private PM enterprises to investigate how the nature of the enterprise affects tensions. Additionally, we encourage researchers to investigate and compare tensions between project owners and PM enterprises across various political and economic backgrounds.

Besides, this research focuses on inter-organizational tensions between the project owner and the external project manager. Future research is expected to compare these inter-organizational tensions with intra-organizational tensions between the project owner and the internal project manager to gain a more comprehensive understanding of the tensions between the project owner and the project manager.

Furthermore, while this study provided valuable insights by retrospectively exploring tensions at three project stages, it acknowledges inherent limitations and potential biases associated with retrospective data. Future research could deepen these insights by conducting longitudinal studies on single or multiple project cases, exploring the dynamics of tension poles and their impact on the realization of project benefits. Another limitation is that the data was collected at the beginning of the owner-manager relationship during early institutional changes, which may have heightened informants' perceptions of tensions related to inter-organizational competition. As inter-organizational relationships develop over time, new tensions may emerge [93]. Future research could consider how various tensions evolve as their relationships progress.

Last but not least, our research indicates that active responses for addressing one tension also positively impact other tensions, whereas defensive responses typically have adverse effects. We have not yet encountered a situation where an active response to tension negatively affects other tensions [15]. A possible reason is that the effectiveness of responses is limited by the temporal boundaries of the study. The term "temporary balance" rather than "virtuous cycle" was thus used in this study. Although challenging, examining the long-term effects of these strategies in future research could prove highly valuable.

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