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Rethinking artificial intelligence in projects: A paradox lens

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ABSTRACT

To fully harness the potential of artificial intelligence in projects, project leaders must navigate a hybrid network of multi-faceted and intertwined tensions. Drawing on paradox theory, I propose that these tensions are paradoxical: persistent, interdependent and multi-level, requiring continuous navigation rather than point-solutions. Additionally, I theorise the interaction between humans and artificial intelligence, through the ‘paradox of interactivity’, ‘paradox of automation’ and ‘paradox of creativity’ by re-conceptualising the agency and affordances of artificial intelligence use in projects. Ultimately, I propose a ‘paradox portfolio’ view of artificial intelligence readiness in projects, where human and artificial intelligence interactions become central to organising.

1. Introduction

Armanios and Tucci (2025) offer a timely and useful provocation about readiness for Artificial Intelligence (AI) in projects, packaging it into the CIPHER framework. CIPHER identifies six tensions: Cognitive, Informational, Projection, Haptic, Exchange, and Resource, and pairs each with a “project lever”, e.g., intergenerational teaming, problem scoping and so forth. While CIPHER claims a dialectic approach to propose these levels to the tensions, it under-activates its dialectic aspirations. Although CIPHER lists discrete tensions, it prescribes single, narrow levers, that limit our ability to grasp AI’s paradoxical, multi-level dynamics in projects and overlooking the interactive work through which humans and AI co-produce projects.

To this extent, the CIPHER framework reads as eclectic across domains such as cognition, information search, immersive reality, automation or robotics, governance and others. The essay does not fully theorise why these six and not others are appropriate and adequate for the project domain, nor does it specify how tensions interact, despite claiming a dialectics approach. In this response, I propose how a dialectical theory of project organising with AI can be leveraged through paradox theory.

Additionally, building on how CIPHER’s six tensions relate to aspects of humans and AI, from human cognition to informational search up to resource constraints, this response proposes how to strengthen its human-AI dynamics perspective through a paradox lens and how to extend CIPHER.

2. Activating dialectics in artificial intelligence through paradox theory

According to Putnam et al. (2016), dialectics are activated when interdependent opposites exist in an “ongoing dynamic interplay” with a focus on uniting or synthesising these opposites. However, CIPHER’s use of “dialectics” relates more to juxtaposition and convenience. In doing so, it ignores the interdependence, persistence and cyclical management emerging in the project levers it invokes: such as information processing, scoping, teaming, governance and so forth. A paradox lens, as formalised by Smith and Lewis (2011), treats tensions as opposing yet mutually constitutive, producing reinforcing cycles, and requiring responses that evolve over time rather than “solve” once-and-for-all (Lewis, 2000; Smith & Lewis, 2011). Fig. 1 illustrates the differences between opposites, dialectics and paradox.

First, CIPHER’s levers are too narrow to capture the breadth of the corresponding tensions. As one key example, the essay’s ‘cognitive’ dialectic is “AI enhances creativity” versus “cognitive offloading/reduced critical thinking” and the lever becomes intergenerational teaming. This can indeed be one plausible micro-mechanism, e.g., tensions between digital natives and digital migrants (Liu et al., 2024), but it does not engage the broader cognitive repertoire unfolding in projects. This can relate to how the project team’s level of trust, competences, culture and sensemaking practices, not demographics alone, may stabilise or destabilise the tension. In order to fully understand readiness, we need to consider all these and more mechanisms happening simultaneously in a paradoxical manner.

Second, the essay’s dialectics are under-specified as interdependent.

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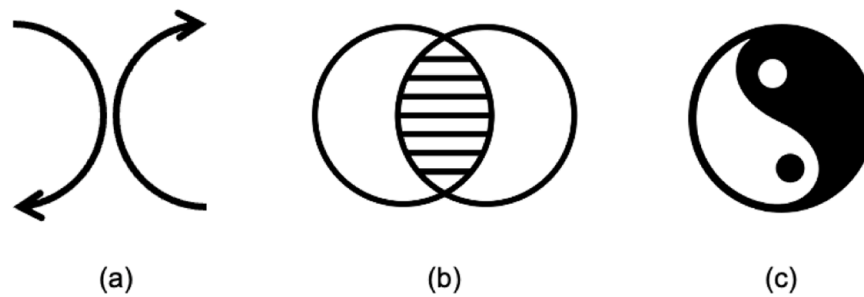


Fig. 1. Schematic illustration of (a) contradictions, (b) dialectics and (c) paradox based on Putnam et al. (2016).

In paradox theory, tensions are often nested and mutually amplifying (Schad et al., 2016), e.g., cognitive offloading can intensify information distortion, hence CIPHER's cognitive tension can spill over to the information tension. Yet CIPHER is written as six parallel lanes, each with its own lever, rather than as a system of interdependent project elements and coupled paradoxes.

Third, the informational tension is framed through a lever of problem scoping, seemingly anchored to front-end planning. However, scoping is not just a stage; it is an ongoing practice. Through the information processing view of projects (Winch, 2005), information is continually produced, contested, translated and stabilised across the project lifecycle. These dynamics align with the paradox theory idea in projects and how it renders information flows as cyclical rather than front-loaded.

Because the levers are narrow and the tensions not inter-related, the CIPHER framework seems eclectic. Paradox navigation benefits from moving beyond “either/or”, or such one-lever prescriptions, toward “both/and” responses (Smith & Lewis, 2011) and arrays of responses that shift with temporalities, stakeholder dynamics and institutional pressures. While Armanios and Tucci (2025) frame AI through a set of project-level dialectics, CIPHER's conceptualisation remains largely intra-organisational and instrumental. This overlooks the broader political economy of AI, where tensions are not only cognitive or informational, but also deeply embedded in relations of power, capital concentration, and governance (Mügge et al., 2026). A dialectical account of AI in projects that ignores cultural or geopolitical patterns of power and politics (Mügge et al., 2026) such as unequal data representation, lack of democratisation, English language dominance, cross-border regulation and uneven access to AI tooling is likely to misrepresent readiness.

From a paradox perspective, these tensions are persistent, multi-faceted and intertwined, and cannot be reduced to discrete managerial levers, but require continuous navigation across organisational, institutional and societal domains. Paradox theory pushes attention to how tensions are socially constructed and institutionally embedded (Ford & Backoff, 1988; Lewis, 2000), not just individually enacted. Thus, CIPHER may become more truly dialectical if it:

- treats the six tensions as a ‘paradox portfolio’ acknowledging their intertwined and nested tensions,
- articulates temporal dynamics of how tensions intensify or relax over project phases or episodes and
- replaces the one lever per tension logic with configurable response arrays or repertoires.

3. Human/AI interaction in projects

CIPHER weakly theorises human/AI interaction as organising, even though it claims to be about readiness in project work. First, earlier work has challenged technology-reductionism by showing that seeing Building Information Modelling (BIM) as a software artefact only partially supports collaboration; instead, collaboration is enabled through a structural view comprising communication, negotiation, conflict

management, teamwork, evolving roles and boundary spanning around artefacts that are interpreted differently across communities (Papadonikolaki et al., 2019). Similarly to BIM, AI can be understood as a socio-technical assemblage whose meaning and effects emerge through situated interactions rather than predefined functionalities.

A structural view places emphasis on both the structure and the agency. Structure is shaped by the outcome of previous agency too (Giddens, 1984). The proliferation of digitalisation and digital technologies has granted agency not only to humans but also to machines, computer systems and most recently, AI, attributing them an active role in how humans use them (Seifert, 2008). This implies a “symmetrical anthropology”, where machines in human-machine interaction in general are considered equal with human roles (Seifert, 2008). In the case of AI, humans are interacting with AI, AI systems are interacting with other AI systems and humans are interacting with humans via AI systems. To this end, hybrid networks of human and AI interacting with each other emerge, associated with the “interactivity paradox”.

First, following this line of thought, by weakly conceptualising the structure and agency surrounding AI, CIPHER becomes reductionist. Although the tensions and levers are identified, it does not systematically explain how these tensions and levers are linked to different AI practices, human roles and dynamics, and how readiness is performed across their boundaries. For instance, CIPHER's Haptic tension relates to robotics and manual manipulation concerning automated versus manual labour and using task separability as a lever. However, the essay does not fully clarify when it is talking about AI as part of learning and reasoning and when about robotics that may or may not be AI-driven.

Without specifying the nature and affordances of the technology, we cannot legitimately infer agency, context and boundaries of its application (Leonardi, 2013). Then the danger is, that technology is used as a proxy rather than a situated practice (Papadonikolaki et al., 2022). For instance, the essay sometimes treats “digital” as a proxy for “AI,” which matters because AI's different affordances, such as learning, inference, data dependence, are what readiness seeks to address. This proxy-thinking changes the diagnosis of tensions and the choice of levers. A clear account of the affordances of AI in projects, as perceived possibilities, even if they may not actually exist, is useful to understanding how AI practice is embedded in projects.

To this end, treating AI as a “black-box” is conceptually limiting the usefulness of CIPHER. Readiness cannot be assessed without specifying “AI for what,” which AI modality is in play, such as generative text, forecasting, optimisation, vision, autonomous agents, what training data and error modes matter and what affordances shape action. Affordances mean that we need to know what possibilities for action the various digital tools present to users. Recent research supports the pluralistic, boundary positioning of AI tools as boundary-spanning objects between actors and domains, mediating relationships among employees, tasks and performance (Prentice et al., 2023). AI systems can be conceptualised as boundary-spanning objects that mediate interactions across organisational roles and knowledge domains. Choroszewicz and Rannisto (2026) acknowledge boundary work dynamics, where AI triggers continuous renegotiation of expertise, authority and roles across

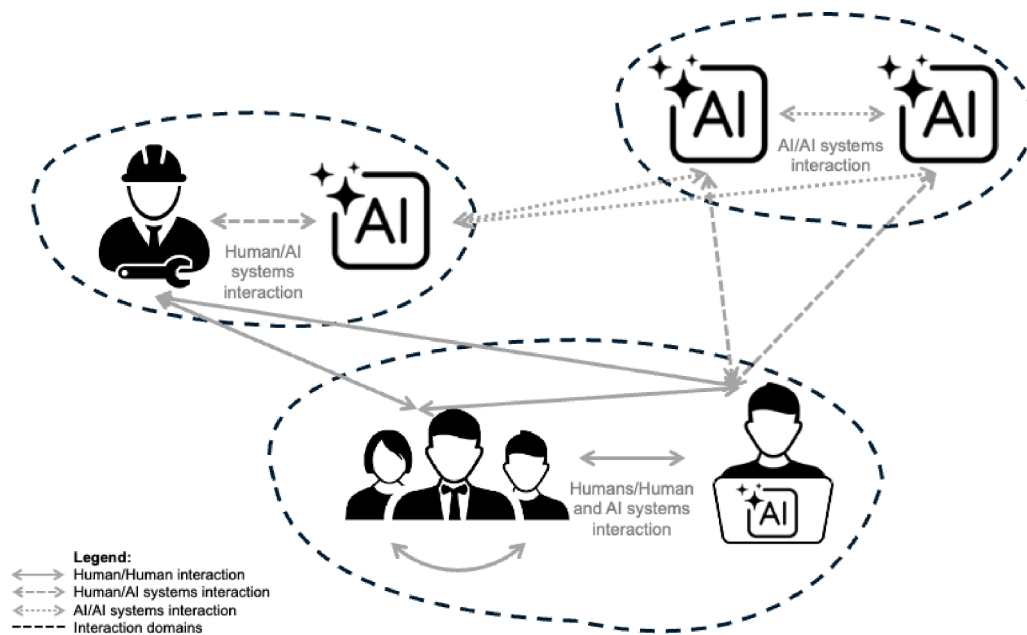


Fig. 2. A hybrid network human-AI interactions over various configurations and AI systems' affordances.

professional domains.

Second, by acknowledging the agency of AI, AI-related roles also emerge as boundary spanning or liminal roles in projects. This assumption is not new but has resurfaced before in the BIM domain, where the tools apart from enabling and structuring collaboration (Papadonikolaki et al., 2019), also outlined new roles for practising humans (Azzouz & Papadonikolaki, 2020). This missing human-AI interaction perspective thus implies that readiness is less about having levers and more about acknowledging and allowing for interactivity through shared frames, escalation paths, negotiated accountability and integration of activities across project, organisational and disciplinary divides.

The CIPHER framework does not clarify how AI agency emerges and is distributed and assumes a largely assistive role of AI, positioning it as a tool augmenting human decision-making. However, emerging research highlights that AI systems actively redistribute authority, reshape expertise and embed specific political and economic interests within project environments (Mügge et al., 2026; Choroszewicz & Rannisto, 2026). Additionally, in human/AI interaction, the “creativity paradox” emerges, when AI both enhances creativity and constrains originality and degrades human skills (Choi et al., 2026). According to the “automation paradox” AI while is meant to reduce workload can increase monitoring burden and cognitive load. Increasingly, organising scholarship on “machines as teammates” emerges that argues that AI can be configured as a collaborating agent rather than a passive tool, which raises questions about coordination, communication, trust and accountability in teams (Hofeditz et al., 2024). CIPHER would be stronger if it situated each tension along the hybrid network of human-AI interaction, as readiness requirements vary dramatically across it. Fig. 2 illustrates some examples of Human/AI interactions.

3. Concluding synthesis of a holistic view for AI readiness in projects

Harnessing AI in projects is less about pairing arguably narrow-focused levers with a named tension but more about building paradoxical capabilities. To be fully ready, project leaders working in projects with AI need to be able to capture paradoxical realities together over time while coordinating meaning, responsibilities and practices across human/AI boundaries.

A proposed extension of CIPHER is based on the following premises:

- The tensions identified at CIPHER are real but lack the acknowledgement of paradox dynamics and
- The human/AI interactions and AI's roles and affordances are missing.

A paradox portfolio view of AI readiness can be formulated from the above. First, instead of six parallel tensions, AI readiness is the capability to navigate a portfolio of interacting paradoxes, some at micro-level, such as cognition, skills, trust, some at a meso-level, such as roles, coordination, governance, and some macro-level, such as institutional, geopolitical, inclusion. Second, I delved into paradox theory to acknowledge the innate paradox of human/AI interaction. As discussed above, AI use in projects relates with a number of well-known paradoxes, such as the “interactivity paradox”, “creativity paradox” and “automation paradox”. These paradoxes are encapsulated into the phenomenon and require an integrated paradox-aware approach to navigate them, rather than contingency thinking and point-solutions. Ultimately, advancing AI in projects requires moving beyond narrow levers toward embracing the inherently paradoxical, multi-level human/AI interactions, where readiness emerges through continuous negotiation of interdependent tensions across project context and practices.

CRediT authorship contribution statement

Eleni Papadonikolaki: Conceptualization, Funding acquisition, Investigation, Visualization, Writing – original draft, Writing – review & editing.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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