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LEADERSHIP UNDER EPISTEMIC UNCERTAINTY

Extended Abstract

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INTRODUCTION

The rapid digitalization of organizations, coupled with the widespread adoption of intelligent technologies[1], is fundamentally reshaping contemporary organizational contexts (Bailey et al., 2022; Sergeeva et al., 2026). Emerging intelligent technologies are no longer confined to discrete tools supporting isolated tasks; instead, they increasingly permeate multiple parts of the organization simultaneously, creating new interdependencies across organizational agents, practices, and boundaries (Bailey et al., 2022). Accordingly, these technologies do not simply automate existing processes; they generate claims about what is likely, optimal, or true through computational inference and large-scale data infrastructures (Sergeeva et al., 2026). In doing so, intelligent technologies become *epistemic technologies* as they increasingly participate in the production, evaluation, and circulation of knowledge that underpins organizing itself, unsettling established knowledge foundations (Scarbrough et al., 2025). Consequently, the relevance and validity of expertise, information, and skills erode ever more rapidly (Susskind & Susskind, 2015). With such developments, no single individual or professional domain can sustain sufficient knowledge required to guide organizational action, establishing *epistemic uncertainty* (Mengis et al., 2018).

When problems cannot be predefined, and relevant knowledge is fragmented across agents, the ongoing *production of direction*, i.e., leadership (Crevani, 2018), becomes as critical as adaptation itself for organizational survival (Uhl-Bien & Arena, 2017). Under such conditions, direction cannot be set unilaterally by formally appointed leaders relying on stable domains of knowledge but must be continuously accomplished through the alignment of interpretations and actions among interdependent organizational agents.

While existing research has examined how digitalization and technologies reshape the future of work, including professions (Susskind & Susskind, 2015), organizing dynamics and work practices (Fischer et al., 2023), routines (Leonardi, 2011), and structures (Orlikowski, 1992), less attention has been given to how these transformations affect the production of direction. This gap is significant, as direction becomes both increasingly problematic and important under conditions of epistemic uncertainty, where no stable basis for guiding action exists, especially as growing complexity makes continuous adaptability a precondition for organizational survival.

Consequently, existing research provides limited insights into how leadership is reconfigured within these digital work contexts. This leads us to ask the following question:

How is leadership reconfigured under conditions of epistemic uncertainty in digital work contexts?

To address this research question, we review the relevant literature and develop a conceptual foundation that frames organizations as complex adaptive socio-technical systems. We introduce epistemic uncertainty as a defining condition of digitally intensive work contexts and conceptualize leadership as the production of direction. Building on this foundation, we present three interrelated conjectures that capture how leadership is reconfigured in the digital age.

[1] For this abstract, we follow Sergeeva et al.'s (2026) use of the term "intelligent technologies" as synonymous with AI. Importantly, "*the qualifier "intelligent" draws on Suchman's (2007) situated view of intelligibility of human-machine interaction and does not imply that AI systems possess human-like cognition.*" (p. 13).

BACKGROUND

As digitalization intensifies and intelligent technologies become increasingly embedded in organizational life, technology is no longer peripheral to organizing but actively shapes how individuals interact, communicate, and coordinate action, making it an integral part of the organizational system (Bailey et al., 2022). Accordingly, we understand organizations as socio-technical systems composed of interdependent and co-evolving social and technical elements (Bostrom & Heinen, 1977; Sarker et al., 2019; Winter et al., 2014). Importantly, technology is not viewed as a deterministic force, but as constituted through evolving relations among organizational contexts, structures, and practices (Bailey et al., 2022), such that organizational outcomes emerge through the ongoing interplay between social and technical elements rather than from either in isolation (Fischer et al., 2023; Mumford, 2006). In line with this perspective, we simultaneously view organizations as complex adaptive systems consisting of two mutually constitutive and interdependent subsystems: an entrepreneurial system oriented toward experimentation and novelty, and an operational system focused on efficiency and structure (Uhl-Bien & Arena, 2017). Organizational adaptability, and thus survival, depends on the dynamic balance and continuous negotiation between these systems (Uhl-Bien & Arena, 2017). As a result, we view organisations as complex adaptive socio-technical systems.

In such systems, balancing novelty and efficiency is achieved through the social processes of organizing, in which knowledge sharing is critical. However, the accelerated pace of change shortens the knowledge half-life, thus rendering it obsolete, as environmental and technological shifts outpace its updating and validation, destabilizing its underlying assumptions (Argote, 2013). Together, these developments give rise to epistemic uncertainty, defined as the absence of stable and reliable knowledge to guide action (Mengis et al., 2018). In work environments with epistemic uncertainty, *epistemic breakdowns,* i.e., situations in which previously taken-for-granted understandings of a problem are no longer viable, are intensified. Under these conditions, established knowledge cannot be relied upon to define the problem or determine a course of action (Mengis et al., 2018; Sergeeva et al., 2026). As expertise becomes increasingly distributed among individuals, epistemic breakdowns require ongoing processes of joint interpretation, in which multiple organizational agents draw on different forms of expertise and negotiate to reconstruct a viable understanding of the situation (Scarbrough et al., 2025; Sergeeva et al., 2026).

Such adaptation processes depend on leadership in enabling and organizing adaptive responses. Rather than pulling toward equilibrium and order, leadership enables the conditions under which adaptive dynamics can emerge and move the system toward ongoing responsiveness (Arena & Uhl-Bien, 2016; Uhl-Bien & Arena, 2017). Therefore, leadership emerges through relational processes that shape how ideas are generated, integrated, and implemented, and cannot be seen as residing in individual authority (Fairhurst & Uhl-Bien, 2012; Uhl-Bien, 2006). Thus, leadership lies in fostering interaction, managing resulting tensions, and enabling the conditions that allow emergent adaptive processes to unfold (Uhl-Bien & Arena, 2017). Accordingly, leadership is less concerned with reducing ambiguity and more with orchestrating the conditions under which adaptive responses can emerge and be integrated into organizational practice.

This suggests that epistemic uncertainty does not merely challenge leadership but reconfigures how direction is produced in complex adaptive socio-technical systems.

PRELIMINARY FINDINGS

To empirically examine how leadership, understood as the production of direction, is reconfigured in practice, we conducted and later thematically coded semi-structured interviews with formally appointed tech leaders in large multinational organizations. Focusing on formally appointed leaders provided insight into how organizational agents who are institutionally expected to establish direction navigate conditions of epistemic uncertainty, in which no stable and reliable basis for guiding action exists, and where relevant expertise is distributed across agents. These interviews served as an "*opening move*" (Elmholdt et al., 2026), enabling a broad exploration of contemporary organizational challenges while remaining open to emergent insights. These insights informed the ongoing development of the study towards an in-depth empirical study investigating the interactional dynamics that enable the production of direction. This may involve observing meetings, digital communications, and interactions, including intelligent technologies, and will allow us to capture what Larsson et al. (2025) describe as "*moments of leadership*" that represent situated instances in which direction is collectively constructed through interaction.

Our preliminary findings suggest that the rapid evolution and adoption of intelligent technologies are fundamentally reshaping how work is organized and coordinated. Interviewees describe intelligent technologies not merely as supportive tools, but as epistemic technologies that actively participate in generating, evaluating, and applying knowledge within organizational processes. For instance, one interviewee refers to GenAI "*as a tool to... to gain better intelligence, gain better automation, and what have you.*" (Interviewee 1), while another emphasizes its impact on decision-making:

> "*One of the most important things that AI can enable is really decision-making, really bringing that clarity on the existing data, really bringing that level of structure that makes things understandable and transparent, and helping leaders really digest that level of information to be able to decide fast." (Interviewee 2).*

Deciding fast becomes a necessity in the complex, accelerated context defined by epistemic uncertainty that organizations find themselves in. This is reflected in how interviewees describe the increased need for continuous recalibration, as one interviewee explains: *"But the horizon changes. To me it... it's more about not a... a year calibration, it's more to 3-6-9 months calibration"* (Interviewee 3). Under such conditions, organizations increasingly encounter epistemic breakdowns in which existing understandings of problems and appropriate responses no longer hold. Simultaneously, expertise becomes fragmented and distributed across organizational agents, each possessing only partial knowledge relevant to ongoing organizational action. Consequently, organizational agents can no longer rely on individual expertise alone but must continuously reassess what constitutes valid knowledge and appropriate action collectively.

Since no single organizational agent possesses sufficient knowledge to fully comprehend the evolving organizational environment, the production of direction increasingly depends on the integration of distributed expertise across organizational agents. Interviewees describe more iterative and adaptive ways of working in which organizational agents continuously explore, interpret, and adjust actions in response to emerging technological possibilities and epistemic uncertainty:

"*We come up with ideas, and then we take those ideas, groom them, and say, "OK, this is what I'm going to build as a feature." Previously, it was a set road map saying, "feature one, feature two, feature three", right? So now it's allowing for that feedback loop also*" (Interviewee 4).

Consequently, direction no longer emerges primarily through authoritative decision-making grounded in stable expertise, but through ongoing processes in which organizational agents collectively negotiate meaning, align interpretations, and coordinate action in real time. This shift challenges traditional leadership models grounded in hierarchical authority and stable expertise, instead emphasizing facilitation and adaptability under conditions of uncertainty. As one interviewee notes:

"*As fast as things are moving, you need to trust, and you need to delegate. It's... you cannot be a, you cannot be a lawyer and a doctor, and an IT architect at the same time, right? That's, yeah, impossible*" (Interviewee 1).

Under these conditions, the production of direction can no longer be described as an act of choosing optimal alternatives. Instead, it emerges as a dynamic and adaptive process shaped by knowledge fragmentation and the distribution of expertise. Leadership thus emerges as a relational process, where organizational agents, each contributing different forms of expertise, come together in an adaptive space to negotiate meaning, align perspectives, and coordinate action in real time.

CONCLUDING REMARKS

This study contributes to IS literature by examining how intelligent technologies, due to their epistemic nature, reshape organizations. Rather than merely supporting decision-making, these technologies actively participate in the construction of knowledge, thereby destabilizing previously stable epistemic foundations. While such developments have long been understood as temporary disruptions, framed as part of a punctuated shift toward a new equilibrium (Gersick, 1991), we instead view epistemic uncertainty as an enduring condition of digitally intensive work environments (Bailey et al., 2022; Winter et al., 2014), characterized not only by rapid change but by the coexistence of competing ways of knowing. As expertise, in turn, becomes distributed, organizing shifts away from individual decision-making toward the collective integration of distributed expertise, where direction is continuously negotiated across agents.

By conceptualizing leadership as the production of direction through relational influence, this study bridges research on digital changes and socio-technical systems with a relational perspective on organizing. It offers a starting point for understanding how direction emerges in digitally mediated environments and provides a foundation for understanding how organizations navigate uncertainty when knowledge is unstable and expertise is distributed.

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