Visualizing Wisdom: A Conceptual Framework of Knowledge Visualization for Wise Judgment in Management, Careers and Transitions

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***Abstract*—Practical wisdom as the ability to make context-sensitive judgments under uncertainty and translate them into proportionate action is increasingly recognized as critical in complex managerial and life decisions. While research has identified core wisdom-related reasoning capacities such as epistemic humility, perspective taking, and integration of competing values, little attention has been paid to how these capacities can be supported through external cognitive tools. At the same time, knowledge visualization research has shown how visual representations enhance cognition, collaboration, and action, yet its role in cultivating practical wisdom remains underexplored. This paper proposes a conceptual framework linking six dimensions of practical wisdom, epistemic, perspective, integrative, contextual, affective, and action, with key functions of knowledge visualization. We argue that visual representations can scaffold wisdom by externalizing uncertainty, juxtaposing perspectives, stabilizing tensions, structuring context, regulating emotion, and guiding action. By integrating insights from wisdom research and visualization research, the framework positions knowledge visualization not merely as a communication aid but as a scaffold for practical wisdom in management and life design contexts.**

Keywords: practical wisdom; knowledge visualization; visual thinking; judgment; decision-making; conceptual framework

I. INTRODUCTION

Managers and individuals increasingly face situations characterized by ambiguity, competing values, emotional stakes, and uncertain outcomes. In such contexts, analytical decision models alone are often insufficient; what is required is practical wisdom – context-sensitive judgment about what is appropriate and proportionate in a given situation [1], [2].

Recent research in psychology and leadership studies conceptualizes wisdom as a set of reasoning capacities, including epistemic humility, perspective taking, integration of competing values, and contextual sensitivity [3], [4]. Despite growing interest in practical wisdom in management and education, little attention has been paid to how such capacities can be supported through external cognitive tools.

At the same time, knowledge visualization research has shown that visual artifacts support cognition, sensemaking, and collaboration across domains such as strategy, innovation, and design thinking [5], [6]. Visual representations externalize thought, enable perspective sharing, and facilitate action [7], [8]. However, the potential of visualization to support wisdom-related reasoning has not yet been systematically conceptualized.

This paper therefore addresses the following research question: How can knowledge visualization support the dimensions of practical wisdom in complex decision contexts? To address this question, we propose a conceptual framework linking six dimensions of practical wisdom with key functions of knowledge visualization.

II. RELATED WORK

A. Practical Wisdom and Wise Reasoning

Practical wisdom (phronesis) refers to the capacity to judge what is appropriate in a particular situation under conditions of uncertainty and to translate that judgment into proportionate action [1], [15]. Originating in Aristotelian virtue ethics, practical wisdom concerns context-sensitive deliberation about what is good and appropriate in a given circumstance. Unlike theoretical knowledge (episteme) or technical skill (techne), it involves navigating situations characterized by ambiguity, competing values, and incomplete information.

Contemporary psychological research conceptualizes wisdom as a set of reasoning processes that support such judgments. Empirical work on wise reasoning highlights patterns such as intellectual humility, awareness of uncertainty and change, perspective taking, and the integration of diverse viewpoints [3], [4]. Rather than viewing wisdom as a fixed personality trait, this research frames it as a context-dependent reasoning strategy that can be activated through reflective thinking and perspective shifting.

Several theoretical traditions converge in describing wisdom as a multi-dimensional competence. Lifespan developmental research conceptualizes wisdom as expert knowledge about the pragmatics of life, involving the ability to understand complex problems, evaluate competing values, and anticipate long-term consequences [16]. Complementary approaches describe wisdom as the capacity to balance multiple interests – individual, interpersonal, and societal – across short- and long-term time horizons [17]. Together, these perspectives emphasize that wisdom integrates cognitive reflection, ethical judgment, and contextual awareness.

In applied contexts, practical wisdom has also been described as a set of learnable competencies supporting judgment and resilience in complex environments [2]. These include reflective perspective taking, contextual sensitivity, emotional regulation, and proportionate action. Research

further suggests that wise reasoning becomes more likely when individuals adopt reflective viewpoints that create psychological distance from immediate reactions, enabling consideration of multiple perspectives and evolving circumstances [4], [18].

Across these perspectives, wisdom emerges as a contextual and relational reasoning competence. Leaders and decision makers often face dilemmas that cannot be solved through purely analytical optimization but require balancing competing priorities and navigating ambiguity. Wisdom therefore involves integrating perspectives, managing tensions, and moving toward constructive action despite uncertainty.

However, many of these reasoning processes – such as integrating perspectives, mapping contextual relationships, or balancing competing values – place significant demands on human cognition. Individuals often struggle to hold multiple viewpoints, time horizons, and emotional considerations simultaneously. As a result, wisdom-related reasoning can remain fragile in everyday practice.

This challenge suggests that external cognitive supports may help scaffold wise reasoning. Tools that externalize uncertainty, represent perspectives, and structure contextual relationships can support reflective judgment and integrative thinking. Knowledge visualization offers such mechanisms by transforming complex judgments into perceptible and shareable structures. As the following section discusses, visual representations can therefore play an important role in supporting wisdom-related reasoning in complex decision environments.

B. Knowledge Visualization and Visual Thinking

Knowledge visualization research demonstrates that visual representations enhance understanding, communication, and collaboration in complex problem-solving contexts [5], [6]. Visual artifacts allow individuals and teams to externalize ideas, compare alternatives, and construct shared meaning across disciplinary or organizational boundaries [7]. By making abstract concepts perceptible and spatially organized, visualization enables participants to inspect relationships, identify patterns, and coordinate interpretations.

Several theoretical perspectives explain why visual representations support cognition and collaboration. Dual coding theory suggests that combining visual and verbal representations enhances processing and recall by activating complementary cognitive channels [9]. Cognitive load theory proposes that structured visual representations reduce working memory demands by organizing information into coherent schemas [10]. Research on visuospatial reasoning further shows that diagrams support relational thinking by making structural relationships visible and manipulable [11].

Beyond individual cognition, visualization also plays an important role in distributed and collaborative thinking. Distributed cognition theory conceptualizes reasoning as a process that is partially externalized across people and artifacts rather than confined to individual minds [12]. In this perspective, visual artifacts function as cognitive scaffolds that stabilize intermediate representations of ideas and enable groups to collectively explore complex problems. Affordance theory further explains how visual structures suggest possible interpretations and actions by making certain relationships perceptually salient [13].

Prior research has therefore identified cognitive, communicative, and social functions of visualization in domains such as strategy development, design thinking, and knowledge management [7], [8], [14]. Visual representations help teams externalize assumptions, align perspectives, and coordinate action in complex environments.

However, despite this growing body of work, the role of visualization in supporting wisdom-related reasoning has not yet been systematically explored. While visualization research has primarily focused on understanding, communication, and collaboration, the reasoning processes associated with practical wisdom, such as integrating perspectives, balancing competing values, and navigating uncertainty, suggest an additional function. Visual representations may serve not only as tools for explaining ideas but also as scaffolds that structure reflective judgment and support the cognitive processes underlying wise decision making.

The following section therefore connects insights from wisdom research with visualization theory by proposing six dimensions through which visual representations can support practical wisdom in complex decision contexts.

III. Visualizing Practical Wisdom

A. Six Dimensions of Practical Wisdom

To connect wisdom research with visualization theory, practical wisdom is conceptualized here as consisting of six interrelated dimensions: (1) Epistemic, as awareness of uncertainty and limits of knowledge; (2) Perspective, as consideration of multiple viewpoints; (3) Integrative, as balancing competing values and tensions; (4) Contextual, as sensitivity to situational structure and constraints, (5) Affective, as regulation of emotion and attachment; and (6) Action, as translation of judgment into proportionate steps.

This structure integrates major components identified across wisdom research while remaining analytically distinct and compatible with visualization theory.

B. Knowledge Visualization as a Wisdom Scaffold

Knowledge visualization supports practical wisdom by externalizing and structuring each dimension. Visual artifacts transform internal reasoning into perceptible structures that individuals and groups can inspect, share, and refine. The following subsections outline how visualization supports each wisdom dimension:

1) Epistemic Dimension

Epistemic wisdom involves recognizing uncertainty and the limits of one's knowledge. Wise judgment begins with acknowledging that complex situations rarely provide complete or reliable information. Visual representations

support this dimension by making assumptions, unknowns, and hypotheses explicit. Instead of remaining implicit in individual reasoning, uncertainties become visible and discussable.

Visualization supports wisdom by making epistemic humility cognitively safe: uncertainty becomes a feature of the canvas rather than a flaw of the individual. When assumptions and unknowns are externalized, individuals and teams can collectively examine what is known, what is uncertain, and what requires further exploration. This reduces overconfidence and encourages exploratory thinking.

Representative artifacts include the Assumption Cloud, Unknowns and Open Questions Canvas, and Life Situation Map, which allow users to visually separate confirmed knowledge, assumptions, and open questions.

In a management context, epistemic visualization can support strategic decision-making under uncertainty. For example, a leadership team considering entry into a new market may map assumptions about customer demand, regulatory conditions, and competitor responses on an Assumption Cloud. By explicitly distinguishing validated insights from speculative assumptions, the team can identify which uncertainties require further research or experimentation before committing to a strategic decision.

In a life or career transition context, epistemic visualization can help individuals reflect on uncertain future paths. For instance, a professional considering a career change may use a Life Situation Map to visualize current skills, interests, and possible opportunities while identifying unknowns such as industry requirements, job satisfaction expectations, or financial implications. By externalizing these uncertainties, individuals can frame their situation as a set of open questions rather than a single high-stakes decision, enabling exploratory actions such as informational interviews or short-term experiments.

In both contexts, visualization transforms uncertainty from an implicit cognitive burden into an explicit object of reflection, supporting more reflective and adaptive decision-making.

2) Perspective Dimension

Perspective wisdom involves recognizing that complex situations can be interpreted differently by various actors and that wise judgment requires considering multiple viewpoints. Decisions are often shaped by the perspectives of stakeholders, roles, and temporal positions. Visual representations support this dimension by making these viewpoints visible and comparable. Instead of remaining implicit in individual interpretations, perspectives become spatially present and open to examination.

Visualization supports wisdom by turning perspective-taking into a perceptual affordance: multiple viewpoints can be displayed simultaneously, allowing individuals and teams to explore how different actors understand the same situation. By externalizing perspectives, visualizations help reduce egocentric bias and encourage empathy and reflective dialogue.

Representative artifacts include the Stakeholder Constellation Map, Past–Present–Future Self Triangle, and Role-Switching Perspective Map, which enable users to visually position actors, roles, or identities and explore their relationships and viewpoints.

In a management context, perspective visualization can support stakeholder-sensitive decision-making. For example, a leadership team designing a new product may create a Stakeholder Constellation Map showing the interests of customers, employees, regulators, and partners. By visually comparing these perspectives, the team can identify tensions or overlooked viewpoints and develop solutions that address multiple stakeholder concerns.

In a life or career transition context, perspective visualization can help individuals reflect on identity shifts and future possibilities. For instance, a professional considering a major career change may use a Past–Present–Future Self Triangle to explore how their current role, past experiences, and desired future identity relate to each other. This visualization helps individuals see their situation from multiple temporal perspectives and reconsider assumptions about what career paths may be possible.

In both contexts, visualization transforms perspective taking from an abstract cognitive effort into a concrete visual process, enabling individuals and groups to reason more reflectively about complex situations.

3) Integrative Dimension

Integrative wisdom involves balancing competing values and navigating tensions between legitimate but conflicting priorities. Many complex decisions cannot be resolved through simple either–or choices but instead require holding multiple values simultaneously and exploring ways to integrate them. Visual representations support this dimension by making value tensions explicit and structurally visible. Instead of remaining implicit pressures within decision-making, competing priorities become identifiable elements that can be examined and discussed.

Visualization supports wisdom by giving tensions a stable home: trade-offs become objects to work with rather than pressures forcing premature binary choices. By externalizing competing values, visualizations allow individuals and teams to explore possible configurations in which both sides of a tension can be addressed over time or across contexts.

Representative artifacts include the Polarity Map, Value Tension Matrix, and Both–And Design Space, which help users map opposing priorities and explore integrative approaches.

In a management context, integrative visualization can support strategic decision-making where organizations must balance competing goals. For example, executives facing a tension between operational efficiency and innovation may use a Polarity Map to visualize how both priorities contribute to long-term performance. This representation helps leaders recognize when overemphasizing one pole creates risks and encourages strategies that sustain a dynamic balance between the two.

In a life or career transition context, individuals often experience tensions between values such as stability and exploration, income and purpose, or security and autonomy. A professional considering a career transition may use a Value Tension Matrix to visualize these competing priorities and identify options that combine elements of both, such as pursuing a side project while maintaining financial stability.

In both contexts, visualization transforms value tensions from hidden conflicts into explicit structures for reflection, enabling individuals and teams to explore integrative solutions and make more balanced decisions.

4) Contextual Dimension

Contextual wisdom involves understanding the situational structure within which decisions take place. Wise judgment requires recognizing constraints, systemic relationships, timing, and environmental conditions that shape what actions are possible or appropriate. Visual representations support this dimension by structuring contextual information and making situational dynamics visible. Instead of remaining fragmented across different pieces of information, relevant factors become organized into a coherent representation of the situation.

Visualization supports wisdom by making context inspectable: situations become structured fields of constraints and possibilities. When contextual elements are mapped visually, individuals and teams can identify patterns, dependencies, and leverage points that may otherwise remain unnoticed.

Representative artifacts include the Situation Diagnosis Canvas, Multi-Lane Timeline, and System or Influence Map, which allow users to map actors, events, constraints, and relationships within a situation.

In a management context, contextual visualization can support strategic sensemaking in complex environments. For example, a leadership team analyzing a new market may use a System or Influence Map to visualize relationships among competitors, regulatory forces, technological developments, and customer trends. This representation helps managers understand how external forces interact and where strategic opportunities or risks may emerge.

In a life or career transition context, contextual visualization can help individuals clarify the conditions surrounding a potential transition. A professional considering relocation or a new career path may use a Situation Diagnosis Canvas to map factors such as financial resources, family commitments, professional networks, and geographic constraints. By visualizing these contextual elements, individuals can better understand which opportunities are feasible and which conditions must change before a transition becomes possible.

In both contexts, visualization transforms complex situational information into structured representations, enabling individuals and teams to better understand the environments in which decisions unfold and to act with greater contextual awareness.

5) Affective Dimension

Affective wisdom involves recognizing and regulating the emotional dynamics that influence judgment. Decisions involving uncertainty, identity, or change often evoke strong emotions that can shape how situations are interpreted. Wise judgment therefore requires awareness of emotional reactions and the ability to reflect on them rather than being driven by them. Visual representations support this dimension by externalizing emotional experiences and making them visible for reflection.

Visualization supports wisdom by turning emotion into a workable object: externalization creates psychological distance and enables reflective evaluation. When emotional responses are mapped visually, individuals and teams can observe patterns, shifts, and attachments that might otherwise remain implicit in their reactions.

Representative artifacts include the Letting-Go / Holding-On Canvas, Energy Curve, and Emotional Transition Timeline, which help users visualize emotional states, motivational energy, and psychological attachments.

In a management context, affective visualization can support leaders navigating organizational change or conflict. For example, a team undergoing a restructuring process may use an Emotional Transition Timeline to map collective reactions such as uncertainty, resistance, or renewed commitment over time. By making emotional dynamics visible, leaders can better understand team responses and design interventions that support constructive adaptation.

In a life or career transition context, individuals often experience emotional fluctuations when facing significant decisions. A professional considering leaving a long-term role may use a Letting-Go / Holding-On Canvas to visualize which aspects of their current situation they wish to retain and which they are ready to release. This process helps individuals acknowledge emotional attachments while clarifying what truly matters for the next stage of their life.

In both contexts, visualization transforms emotional experiences from internal reactions into explicit objects of reflection, supporting more balanced judgment and emotionally aware decision-making.

6) Action Dimension

Practical wisdom ultimately culminates in proportionate action under conditions of uncertainty. Wise judgment is not only reflective but also practical: it involves translating understanding into steps that are appropriate, timely, and responsive to evolving circumstances. Visual representations support this dimension by clarifying the relationship between the current situation and desired outcomes. Instead of remaining abstract intentions, potential actions become visible pathways that can be explored and adjusted.

Visualization supports wisdom by converting judgment into momentum: visible gaps invite action. When the distance between a present state and a desired future is visually represented, individuals and teams can identify concrete steps that move the situation forward while remaining adaptable to new information.

Representative artifacts include the Visual Gap Map, 30-Day Experiment Board, and Conflict Reframing Canvas, which structure potential actions, experiments, and reframing strategies.

In a management context, action-oriented visualization can support strategic implementation and problem solving. For example, a leadership team pursuing a new strategic direction may use a Visual Gap Map to illustrate the difference between current organizational capabilities and the capabilities required for the desired future position. This representation helps identify priority initiatives, pilot projects, or capability-building steps that gradually close the gap.

In a life or career transition context, individuals may use a 30-Day Experiment Board to explore possible future directions through small, low-risk actions. A professional considering a career shift might map short-term experiments such as informational interviews, short courses, or temporary projects. By visualizing these steps, individuals can move from reflection to experimentation without committing prematurely to a single path.

In both contexts, visualization transforms reflection into structured action, enabling individuals and teams to translate judgment into purposeful experimentation and adaptive progress.

C. Integrative Framework

Taken together, the six dimensions form a model of visualized practical wisdom. Knowledge visualization scaffolds wisdom by: (1) externalizing uncertainty (epistemic); (2) juxtaposing perspectives (perspective); (3) stabilizing tensions (integrative); (4) structuring context (contextual); (5) externalizing emotion (affective); and (6) guiding action (action).

Taken together, the six dimensions form a model of visualized practical wisdom, illustrating how knowledge visualization can support reflective judgment in complex decision environments. Rather than representing independent elements, the dimensions interact as complementary reasoning processes that help individuals and groups navigate uncertainty, competing values, and evolving contexts.

The framework highlights how visualization can structure decision-making processes that would otherwise remain cognitively demanding and difficult to coordinate. By externalizing uncertainty, perspectives, tensions, contextual factors, emotional dynamics, and possible actions, visual artifacts transform complex judgments into inspectable and shareable representations. This allows individuals and teams to reason about difficult situations in a more structured and collaborative way.

In management contexts, such a framework provides a practical structure for navigating strategic and organizational decisions characterized by ambiguity and competing stakeholder interests. Managers frequently face situations where analytical models alone are insufficient, for example when balancing short-term performance with long-term sustainability, aligning diverse stakeholder expectations, or making decisions with incomplete information. Visualization tools grounded in the six dimensions can support these processes by enabling leadership teams to jointly explore uncertainties, map stakeholder perspectives, stabilize tensions between strategic priorities, and translate reflection into coordinated action. In this sense, visualized wisdom practices can complement traditional analytical approaches by supporting the reflective and integrative aspects of managerial judgment.

Beyond organizational settings, the framework is also relevant for decision-making across the life course. Individuals encounter numerous transition points, from early career choices and identity exploration to mid-career shifts, leadership responsibilities, or retirement transitions. These situations share characteristics with managerial decision contexts: they involve uncertainty, multiple perspectives, emotional dynamics, and the need to balance competing values such as security, exploration, meaning, or financial stability. Visual representations can help individuals structure these complex considerations by making options, constraints, and emotional responses visible, thereby supporting more reflective and adaptive life decisions.

Importantly, the framework emphasizes that wisdom is not solely an individual cognitive trait but can be supported by external artifacts and practices. Visual tools allow reasoning processes to be distributed across individuals, representations, and conversations. This enables both individuals and groups to hold multiple perspectives simultaneously, explore tensions constructively, and gradually move from reflection toward experimentation and action.

In this sense, visualized practical wisdom offers a bridge between research on wise reasoning and practical decision-making. It provides a conceptual structure for designing visual tools that support reflective judgment in both managerial and life contexts. Thus, visualization does not merely enhance understanding but helps shape the cognitive–affective–social environment in which decisions are made, enabling individuals and teams to navigate uncertainty and transitions more wisely [12].

IV. Implications and Future Research

This paper contributes to visualization research by positioning knowledge visualization as a scaffold for practical wisdom rather than solely a tool for cognition or communication. While prior work has primarily examined visualization as a means to improve understanding, information processing, or collaboration, the framework proposed here highlights how visual representations can support reflective processes associated with wise judgment. By externalizing uncertainty, perspectives, tensions, contextual relationships, emotional dynamics, and possible actions, visual artifacts enable individuals and groups to reason more systematically about complex situations.

At the same time, the paper contributes to wisdom research by identifying visualization as a mechanism that can support wisdom-related reasoning in practice. Wisdom

research has largely focused on cognitive and developmental processes, paying comparatively little attention to the external tools that may scaffold such reasoning. The framework suggests that visual representations can function as cognitive and social infrastructures that make reflective judgment more accessible in real-world decision contexts.

For management and leadership development, these insights suggest that visual thinking practices may provide powerful tools for cultivating judgment in environments characterized by uncertainty and competing priorities. Managers frequently face decisions involving multiple stakeholders, incomplete information, and rapidly evolving conditions. Visual artifacts can help leadership teams externalize assumptions, explore alternative perspectives, and coordinate collective reflection before committing to action. In this way, visual thinking complements analytical decision models by supporting the integrative and reflective aspects of managerial judgment.

Beyond organizational settings, the framework also has implications for individual decision-making across the life course. Many important life decisions, from early career choices to mid-career transitions, leadership roles, or retirement, share characteristics with complex managerial problems: uncertainty, emotional dynamics, and competing values. Visual reflection tools may therefore help individuals structure their thinking about career and life transitions by making possibilities, constraints, and motivations visible, turning abstract dilemmas into structured reflections that support deliberate exploration.

These insights are particularly relevant for universities and educational institutions, which increasingly support individuals throughout their professional development. While universities traditionally focus on transferring disciplinary knowledge, many graduates and professionals struggle with navigating complex career and life transitions. Integrating visual reflection tools into programs such as career workshops, leadership development, or alumni initiatives could help individuals clarify identity, goals, and opportunities while enabling collective dialogue among peers and mentors.

Looking forward, an important area for future research concerns the interaction between visual thinking, human wisdom, and artificial intelligence. As AI systems increasingly support decision-making, questions arise about how human judgment and machine intelligence can complement each other. Visual representations may serve as a bridge by creating shared interfaces through which humans and AI systems jointly explore complex situations, enabling forms of hybrid intelligence that combine computational analysis with human judgment [20]. AI tools may generate scenarios, identify patterns, or simulate consequences of different actions, supporting human decision-making processes in complex environments [21]. In this context, frameworks such as MIT's EPOCH perspective on unique human capabilities, emphasizing empathy, presence, opinion, creativity, and hope, highlight qualities central to human decision-making [19]. Integrating visual thinking tools with these human capacities may enable hybrid decision environments in which analytical insights from AI are combined with human interpretation and contextual awareness. Visualization could thus function as a shared cognitive workspace where human intuition, collective reflection, and AI-generated insights interact productively within visual analytics environments [22].

Future research could therefore examine how visual wisdom tools function in hybrid human–AI decision environments. Experimental studies may investigate how visual representations influence judgment quality, perspective integration, and learning when combined with AI-supported insights. Comparative studies between visual and textual reflection approaches could further clarify how visualization affects the depth and quality of reasoning in complex decisions.

Finally, the framework also suggests opportunities for knowledge transfer across generations. Many individuals' entering retirement possess extensive professional knowledge and practical experience that can benefit younger generations. Visual reflection tools grounded in practical wisdom may provide structured ways for senior managers, retirees and experienced humans in general to articulate lessons learned, map decision experiences, and share insights with students or early-career professionals. Such visual knowledge artifacts could support mentorship programs, intergenerational learning, and reflective storytelling practices.

In this way, the integration of visual thinking, practical wisdom, and emerging technologies opens new avenues for supporting reflective decision-making across organizations, educational institutions, and life stages. Rather than serving only as communication aids, visual tools may help individuals and communities navigate uncertainty, cultivate judgment, and transmit experiential knowledge across generations.

V. Conclusion

Practical wisdom is increasingly recognized as essential for navigating complex managerial and life decisions. Yet how such wisdom can be cultivated and supported in practice remains largely unexplored.

This paper proposes that knowledge visualization can scaffold practical wisdom by externalizing and structuring six core dimensions of wise reasoning: epistemic awareness, perspective taking, integrative balance, contextual understanding, affective reflection, and action orientation. By transforming internal judgment processes into visible and shareable structures, visual artifacts enable individuals and groups to reason more reflectively and act more deliberately under uncertainty.

By conceptualizing visualization as a scaffold for wisdom rather than merely a tool for communication or cognition, this paper contributes to both visualization and wisdom research. The framework opens avenues for future empirical work on how visual tools can support reflective judgment, collaborative sensemaking, adaptive action and integration of AI in complex decision environments.

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