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# Frictionless Futures, Invisible Conflicts: The Case for Scenario Methodology in IS Research

Short Paper

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## Abstract

*Information systems (IS) research has established AI as a delegation-capable organizational actor with normative consequences. Yet this body of work is methodologically present-bound: it explains how humans and AI coordinate in existing arrangements, not what competing arrangements are possible before design and governance decisions foreclose them. IS has opened epistemological space for researching not-yet-accessible phenomena, but without specifying a method. I argue that scenario methodology fills this gap: not as a management tool, but as a research method that structurally preserves contested stakeholder positions, unresolved normative conflicts, and structured uncertainty. I call this epistemic friction. A comparative corpus study of 4,320 human-authored and GPT-generated scenarios shows what is lost when friction disappears: high-certainty, low-contention, technology-centric futures. Strategically appealing. Analytically impoverished. This pattern illustrates precisely what IS research on human-AI coexistence cannot afford to reproduce.*

**Keywords:** Scenario methodology, generative AI, futures research, IS theory-building

## Introduction

*“(...) generative AI can help address many of the core limitations of traditional scenario planning approaches in three stages: scenario creation, narrative exploration, and strategy generation.”* Harvard Business Review (Finkenstadt et al. 2023)

IS research treats AI as a delegation-capable organizational actor (Ågerfalk 2020; Berente et al. 2021) whose decisions redistribute accountability (Dolata et al. 2022), reshape coordination norms (Ågerfalk et al. 2022), and carry normative weight (Spiekermann et al. 2022). This literature is empirically rich, but methodologically present-bound, explaining how people delegate to, or recalibrate alongside AI systems (Ågerfalk 2020; Berente et al. 2021; Dolata et al. 2022). It does not examine competing arrangements *before* design and governance decisions foreclose them. This leads to anticipated role divisions between humans and AI, emerging coordination norms, stakeholder conflicts over AI governance, and normative assumptions embedded in design choices, all of these form through present decisions but unfold across futures that present-oriented methods cannot access (Baskerville et al. 2018; Baskerville et al. 2020). IS usually arrives after the implementation (Cecez-Kecmanovic 2021).

IS researchers have opened epistemological space for inquiries anticipating the future. Hovorka and Peter speculatively engage possible digital worlds (Hovorka and Peter 2021a); Hovorka and Mueller treat speculation as a mode of inquiry with distinct epistemic functions (Hovorka and Mueller 2024a; Hovorka and Peter 2021b; Hovorka et al. 2025); Schlagwein et al. define digital futures as a research domain (Schlagwein et al. 2025); Gray and Hovav demonstrate that futures techniques apply to IS problems (Gray and Hovav 2008; Niederman 2023). This work provides the epistemological license (Chiasson et al. 2018), but it does not provide a specified method—one with process criteria, quality standards, and epistemic justification tied to a

concrete IS research problem. Scenario methodology is already used in IS, but in roles that differ from what I propose. IS research use scenarios as experimental vignettes (Chang et al. 2013; Chen et al. 2012; Lowry et al. 2013), as implementation artefacts in case research (Holmqvist and Pessi 2006), as action-research instruments (Ahn and Skudlark 2002), and as participatory workshop outputs (Janssen et al. 2007). These uses are methodologically specified for their respective purposes. None treats scenarios as a theory-building research method (Ramirez et al. 2015), whose epistemic value depends on preserving conflict, uncertainty, and contested positions. These properties, I term *epistemic friction*, are needed to preserve plurality.

This paper asks: *Under what conditions can scenario methodology serve as an IS research method for human-AI coexistence, and what epistemic properties must the scenario process preserve to produce evidence suitable for IS theory-building?*

I answer this question in three moves. First, I develop epistemic friction as a methodological concept: the structured preservation of contested positions, normative conflicts, and uncertainty that gives a scenario set evidential value for theory-building. Second, I test the concept at its boundary. Scenario production itself has become a human-AI coexistence setting: organizations already delegate the writing of futures to generative AI. A comparative corpus study of 4,320 human-authored and GPT-generated scenarios (Kozachek 2026) shows what happens to the three properties when production shifts to AI: the generated futures are high-certainty, low-contention, and technology-centric, appealing for management, but often unsuitable for research. Third, I specify conditions under which scenario methodology produces evidence for IS theory-building on human-AI coexistence, and outline a research agenda. This short paper argues the methodological position; the corpus study that illustrates it is published prior work (Kozachek 2026), and the full empirical analysis appears there.

## **Related Work**

**Human-AI Coexistence in IS Research** treats AI as an organizational actor that delegates, decides, and redistributes accountability (Ågerfalk 2020; Berente et al. 2021). Algorithmic decision-making embeds normative commitments opaque to those affected (Dolata et al. 2022); AI integration shifts who answers for what across organizational roles (Ågerfalk et al. 2022; Spiekermann et al. 2022). Taken together, these studies show that humans and AI negotiate authority, roles, and norms under incomplete information. Naturally, most studies in this line examine arrangements already in place: delegation patterns after deployment, governance structures after implementation, accountability regimes after breakdown. Which role divisions stakeholders expect and contest before deployment, which coordination norms remain open, which design assumptions will be challenged—these phenomena require methods that engage futures before decisions foreclose them (Schlagwein et al. 2025).

**Futures-Oriented IS Research** has opened epistemological space for this kind of work. Speculative engagement with possible digital worlds has produced theory that retrospective methods could not (Hovorka and Peter 2021a). Speculation now functions as a mode of IS inquiry that treats uncertainty and plurality as conditions of knowledge (Hovorka and Mueller 2024a; Hovorka and Mueller 2024b). Digital futures have been defined as a research domain distinct from forecasting (Schlagwein et al. 2025), and futuring, design-oriented imagination (Ciriello and Richter 2019), has been proposed as a way to make possible worlds researchable (Hovorka et al. 2025). This work warrants futures inquiry in IS. It does not specify how to do it. Futures techniques transfer to IS, and scenario procedures have been sketched (Gray and Hovav 2008). But no quality criteria exist for scenario-based IS research, no standards for process design, and no account of how scenario outputs serve as evidence in theory-building. I supply these for the case of human-AI coexistence.

**Scenario Methodology in IS** appears in three forms (Godet 2001; Wack 1985). First, scenarios serve as experimental stimuli: controlled vignettes that test behavioral responses under specified conditions (Chang et al. 2013; Chen et al. 2012; Gupta et al. 2017; Lowry et al. 2013). Their epistemic value lies in internal validity and ecological plausibility; conflict and uncertainty are controlled out, not preserved. Second, scenarios function as implementation artefacts in case and action research, documents that orient organizational change and get revised as circumstances shift (Ahn and Skudlark 2002; Ciriello and Richter 2019; Holmqvist and Pessi 2006; Jarke et al. 1998). They help practitioners manage ambiguity but do not surface

contested positions. Third, participatory scenario construction supports policy foresight (Heikkinen et al. 2008; Janssen et al. 2007). Workshop procedures, moderation protocols, and cross-scenario analysis are specified. This tradition comes closest to futures studies methodology; its connection to IS theory-building remains to be made, and this paper makes it. Across all three uses, conflict, uncertainty, and contested positions appear as features to manage, not as properties whose preservation determines whether scenarios can serve as research evidence. I call these properties epistemic friction and develop them as a methodological concept in the next section.

## Epistemic Friction as a Methodological Lens

Scenario methodology in futures studies does not aim to predict, it produces structured accounts of competing futures (Godet 2001; Gray and Hovav 2008; Wack 1985). These scenarios differ in assumptions, stakeholder interests, and normative commitments (Gray and Hovav 2008; Hirsch et al. 2013). The methodological literature treats scenarios as communicative practice: organized processes in which participants negotiate what counts as plausible, desirable, or threatening (Duckett et al. 2017; Wright et al. 2013). Disagreement between participants is not noise to filter; it is the signal that makes scenarios useful as research evidence (Hargrave and Van de Ven 2017; Tung and Quaddus 2001). I formalize this observation as *epistemic friction*: the structured preservation of three properties across the scenario production process. Each property originates in a specific methodological tradition, and together they form a causal chain from process design to evidential value.

**Contested positions** originate in participatory scenario practice. Workshop designs recruit actors with incompatible assumptions about the future (Duckett et al. 2017; Holmqvist and Pessi 2006; Janssen et al. 2007) because scenarios earn scholarly value by challenging existing assumptions (Ramirez et al. 2015), and a process can only challenge assumptions its participants disagree on. A scenario set built from consensus confirms what its participants already believed.

**Normative conflict** originates in the dialectics literature on organizational contradiction (Hargrave and Van de Ven 2017; Tung and Quaddus 2001). Incompatible assumptions, once they meet in one process, surface trade-offs between values as well as between variables (Goodwin and Wright 2010). Preserved contestation forces the question of who benefits and who loses; for human-AI coexistence, scenarios must name whose autonomy expands, whose contracts, and under what governance assumptions.

**Structured uncertainty** originates in the distinction between scenarios and forecasts (Robinson 1982; Voros 2003; Wack 1985). Where a forecast converges on one expected outcome, a scenario set keeps several trajectories open, and unresolved normative conflict keeps them open: as long as value trade-offs stay contested, closure on a single future stays unjustified.

Epistemic friction is the joint presence of all three properties across the design, execution, and output of a scenario process. This chain determines when scenarios can serve as research evidence. IS theory-building on human-AI coexistence requires evidence about competing arrangements before decisions foreclose them. Without contested positions, a scenario process reproduces the assumptions its participants share. Without normative conflict, the resulting futures leave competing arrangements indistinguishable, because winners, losers, and governance stakes remain unnamed. Without structured uncertainty, the output converges into a prediction, and prediction is the business of forecasting. A scenario set that fails any of the three tests still reads as plausible; it stops functioning as evidence for IS theory-building.

The concept connects to IS research on how AI reduces epistemic diversity. When AI advice homogenizes individual judgments, collective knowledge suffers even as individual accuracy improves (Berente et al. 2021). When humans perceive agreement with AI rather than conflict, they shift to shallower reflection (Hovorka and Mueller 2024b). Translated to scenario work: AI may accelerate production while eliminating the disagreement, value conflict, and open uncertainty that make scenarios worth producing in the first place. The next section tests whether this is what happens.

## Research Design

The corpus comparison serves as a boundary test of the friction concept. Scenario production is itself a setting of human-AI coexistence: the delegation this paper studies as a phenomenon now occurs inside the method, as organizations hand scenario writing to generative models (Kozachek 2026). If epistemic friction determines whether scenarios can serve as research evidence, a production regime that strips contested positions, normative conflict, and structured uncertainty must yield outputs that fail as evidence in measurable ways. I draw on a comparative corpus of 4,320 scenarios (Kozachek 2026) to run this test. This paper reuses the published study as an illustration and reports the analyses that trace the three friction properties; full protocols and analyses appear in the original publications (Kozachek 2023; Kozachek 2026). The corpus comprises 1,080 human-authored and three sets of 1,080 machine-generated scenarios, all addressing education, energy, and governance for 2030. The human scenarios were scraped from institutional foresight publications (European Commission, OECD, World Economic Forum) and parsed into single-sentence statements; a typical entry reads: “a reduction in working hours, as demanded by trade unions and employee associations, is now often practiced because of economic crisis situations.” GPT-3 was fine-tuned on prompt-completion pairs derived from this human corpus; GPT-3.5 and GPT-4 were prompted with 30 curated future-oriented questions (e.g., “How might [...] technologies transform the classroom experience in Europe by 2030?”) under generation parameters validated by two experts from foresight and NLP.<sup>1</sup> The three friction properties are process properties; at corpus level they are observable through the traces they leave in scenario text. Each property maps to the trace it necessarily produces:

**1. Contested positions require carriers.** A position can only be contested when an identifiable actor holds it: a scenario that names teachers’ unions and ministries can carry incompatible assumptions; a scenario that names no one cannot. Named entity recognition therefore counts distinct actors (persons, organizations, geopolitical entities) appearing as core subjects per 1,000 words. The measure captures whether a corpus distributes agency across parties able to disagree; whether they actually disagree is the object of the second measure.

**2. Normative conflict is articulated conflict:** trade-offs between values become visible as conflict vocabulary and as negative valence. I compare distributions of positive, negative, and neutral valence across sources and track conflict terms (protest, unemployment, inequality, trade-off). These measures capture trade-offs that scenarios name; they miss conflict that is implied without being named, and thus yield a conservative estimate.

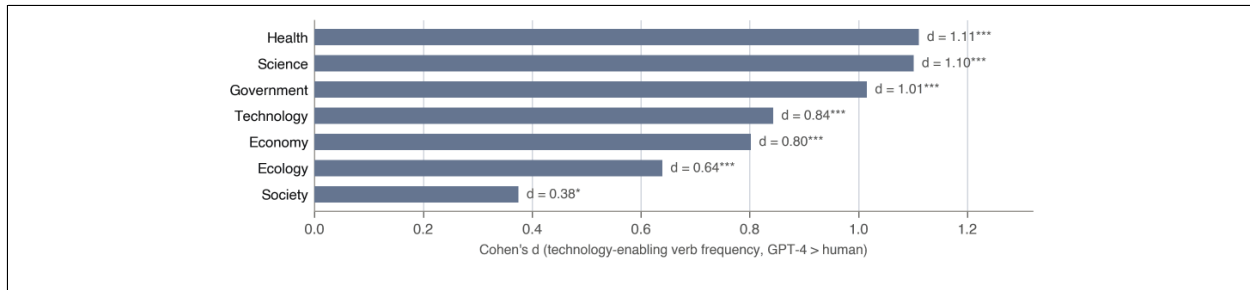
**3. Structured uncertainty is open trajectories.** A corpus that keeps several futures open spreads across topics and hedges its claims; a corpus that has converged reads like a prediction. Topic modeling (LDA), lexical diversity, and uncertainty modal counts (may, could, if, whether) capture this openness; a corpus with concentrated topics and few modals has converted scenarios into predictions.

## Empirical Evidence: How AI-Generated Scenarios Lose Friction

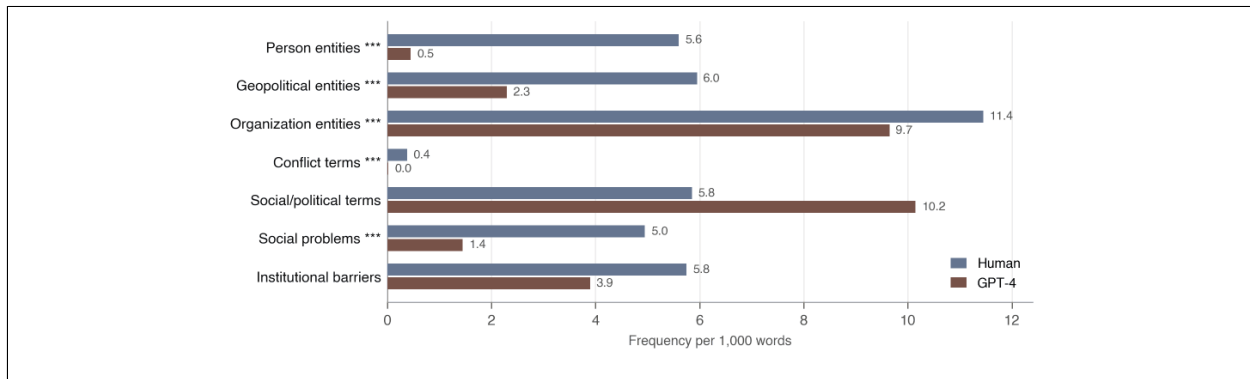
**Contested Positions Collapse.** Technology-enabling terminology appears as core subject in 6 of 7 topic clusters (Figure 1); GPT-4 scenarios contain 92% fewer person references, 62% fewer geopolitical entities, and 16% fewer organization references per 1,000 words than human-authored scenarios (Figure 2), while human-authored scenarios distribute agency across institutional, political, and individual actors. The effect holds across all seven domains tested (Cohen’s  $d$ : 0.375 to 1.111 for technology-enabling verb frequency), with the largest effect in government ( $d = 1.15$ ), where “smart governance” framings dominate GPT outputs (Kozachek 2026). Consider a scenario that reads “education systems broadly adopt AI” rather than “teachers’ unions resist standardized AI assessment while ministries push adoption targets” has removed the actors, whose disagreement opens futures for investigation (Figure 2). For IS research on human-AI coexistence, where competing role divisions and governance conflicts are the object of inquiry (Ågerfalk 2020; Dolata et al. 2022), this removal may eliminate the phenomenon under study.

**Normative Conflict Disappears.** GPT-3.5 and GPT-4 scenarios show significantly contentious terms (unemployment, war, protest, bureaucracy, law, conflict) drop out; abstract consensus terms (ethical, com-

<sup>1</sup>Corpus, prompts, and fine-tuning protocols: <https://github.com/koizachek/VisionaryMachine>



**Figure 1. Technology-enabling verbs, GPT-4 vs. human scenarios (Cohen's  $d$  per domain)**



**Figure 2. GPT-4 reduces named actors and conflict terms (\*\*\* $p < 0.001$ , Mann-Whitney U)**

munities, platforms, privacy, regulations) replace them (Figure 1). This pattern aligns with RLHF alignment toward positive, “safe” outputs (Grover et al. 2023). The loss of conflict vocabulary points to an asymmetry of authorial intent. The human corpus carries motives that readers can inspect: institutional foresight publications name their commissioning bodies, mandates, and stakeholder interests. Generative models write under objective functions and alignment tuning that remain opaque to the reader (Kozachek 2026; Rowland and Grüning 2025; Spaniol and Rowland 2023), while management and strategy outlets actively promote this mode of production (Chermack et al. 2026; Finkenstadt et al. 2023; Ramírez et al. 2025), which makes the asymmetry a growing condition of foresight practice. A two-round Delphi evaluation (Linstone and Turoff 2002) embedded in the corpus study (Kozachek 2026) asked 40 domain experts to rate scenario plausibility and identify their source blindly. Friction loss did not register at the level of individual scenarios — it surfaced only in aggregate computational analysis (Figure 3). If expert judgment cannot detect friction loss, safeguards must be built into the scenario production process itself, not delegated to post-hoc review.

**Structured Uncertainty Collapses into Certainty.** GPT scenarios use significantly more technology-enabling verbs and fewer uncertainty modals across all domains tested (Figure 1). Topic modeling shows convergence on fewer, more homogeneous clusters; lexical diversity declines with model advancement. Temporal markers that anchor futures in governance cycles, implementation stages, and budgeting rhythms disappear in socio-political domains while persisting in techno-scientific ones. GPT scenarios cluster in the high-certainty, low-contention quadrant; human-authored and practitioner scenarios occupy the low-certainty, low-contention space. The separation across quadrants operationalizes friction loss at the corpus level (Figure 3). Where scenario methodology for IS theory-building requires open alternatives (Goodwin and Wright 2010; Gray and Hovav 2008), AI production closes them. The same properties that make AI scenarios useful as research evidence for management (certainty, coherence) are the properties that disqualify them as evidence for IS research on contested futures.

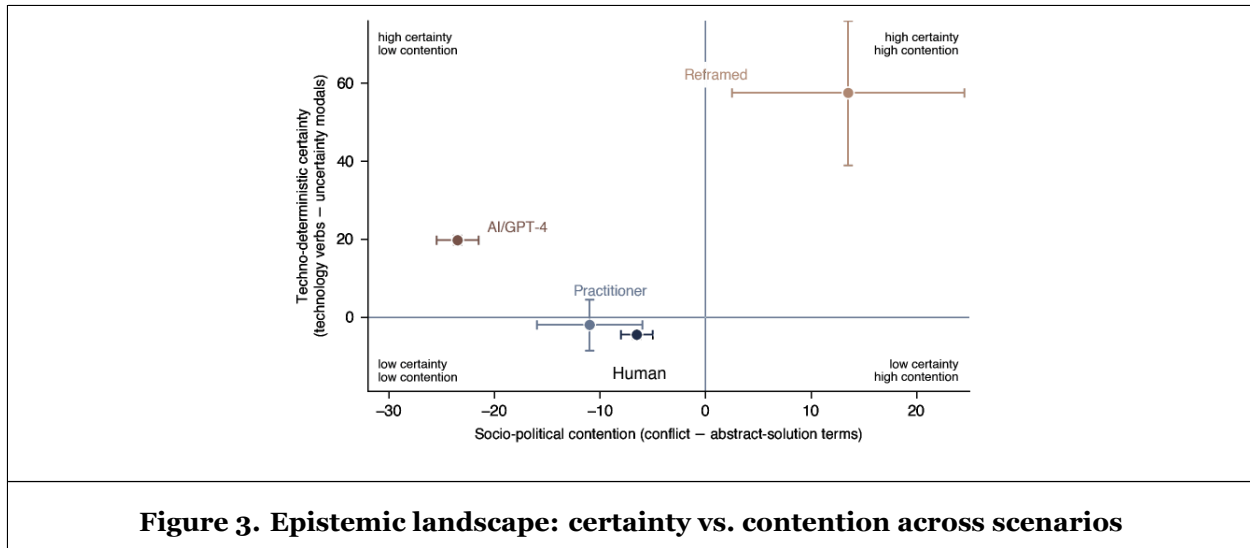


Figure 3. Epistemic landscape: certainty vs. contention across scenarios

## Conditions, Implications, and Limitations

The empirical evidence shows what friction loss looks like. I now specify conditions under which scenario methodology preserves friction and can produce evidence for IS theory-building on human-AI coexistence.

**Condition 1: Stakeholder heterogeneity.** The scenario process must include participants who hold incompatible assumptions about human-AI arrangements. Workers, regulators, developers, citizens, and those excluded from AI access bring different stakes to the same question. Without this heterogeneity, contested positions cannot form (Holmqvist and Pessi 2006; Janssen et al. 2007).

**Condition 2: Conflict preservation in output.** Moderation protocols and evaluation criteria must reward articulating trade-offs rather than resolving them. Scenarios that name who benefits and who loses under each arrangement expose the normative structure of the future; scenarios that describe arrangements without distributional consequences suppress it (Hargrave and Van de Ven 2017; Tung and Quaddus 2001). Where the producer's intent cannot be inspected, as with generative models, this process requirement substitutes for the missing transparency: the output must show its conflicts because its author cannot be asked.

**Condition 3: Maintained uncertainty.** Multiple competing trajectories must survive into the final output: across thematic scope (different arrangements, not variations on one), temporal structure (sequences and contingencies, not endpoints), and linguistic register (conditional language where evidence is absent) (Goodwin and Wright 2010; Gray and Hovav 2008; Robinson 1982).

**Implications for Theory.** This paper contributes to IS methodology by specifying scenario methodology as a research method for phenomena not yet empirically accessible, with criteria for process design and epistemic justification. It extends the futures-oriented IS agenda (Hovorka and Mueller 2024a; Hovorka and Mueller 2024b; Schlagwein et al. 2025) from epistemological legitimation to methodological specification. The concept of epistemic friction offers IS researchers a criterion to distinguish scenario processes that produce research evidence from those that produce management outputs. For the IS literature on human-AI coexistence (Ågerfalk 2020; Ågerfalk et al. 2022; Berente et al. 2021; Dolata et al. 2022; Spiekermann et al. 2022), the paper identifies specific phenomena that remain invisible without scenario inquiry: anticipated role divisions, emerging coordination norms, stakeholder conflicts over AI governance, and normative assumptions embedded in design decisions before deployment. These phenomena are constituted through present decisions but unfold in futures that present-oriented methods cannot reach.

**Implications for Practice.** Organizations that use AI to generate strategic scenarios should treat the corpus evidence as a warning. AI-generated futures are plausible and efficient to produce, but also high-certainty, low-contention, and technology-centric. If governance and design decisions rely on these futures

without friction-preserving human processes, they risk foreclosing alternatives that would otherwise remain open for contestation (Berente et al. 2021). This warning connects the friction criterion to the corporate foresight and risk literature, which treats scenario planning as an instrument for managing strategic uncertainty (Hirsch et al. 2013; Tesch 2019; Wenzel 2022). A scenario set that has quietly resolved uncertainty conceals the risk it was commissioned to manage; the three friction properties give risk managers a test for this condition before decisions build on it. The three process conditions (stakeholder heterogeneity, conflict preservation, maintained uncertainty) translate directly into design guidance for hybrid human-AI foresight workflows in organizations, by constraining AI's role without excluding it. AI can accelerate early ideation, identify blind spots in human-authored drafts, and test internal consistency of scenario logics. The corpus evidence suggests a specific use: AI as diagnostic instrument, detecting missing actors, absent conflict vocabulary (Figure 3), or premature convergence in human-authored scenarios (Kozachek 2026). This reverses the default assumption. AI does not write scenarios for IS research, it audits them.

**Limitations.** The corpus study compares scenarios across "authors" (human vs. three GPT generations). The human-authored corpus draws from institutional foresight publications, which carry their own selection biases, normative orientations, and thematic emphases. The friction I observe in human scenarios may partly reflect institutional diversity of the publishing organizations rather than properties of human scenario production. The concept of epistemic friction is developed for the specific case of human-AI coexistence in IS. Its applicability to other IS research domains that require futures inquiry (e.g., sustainability, platform governance, digital inequality (Qureshi et al. 2021)) remains to be tested. Finally, the analysis covers fine-tuneable GPT-models. Newer models may produce different output patterns.

## Conclusion and Next Steps

IS research on human-AI coexistence explains how people and AI coordinate in existing arrangements (Ågerfalk 2020; Berente et al. 2021). It does not examine competing arrangements before design and governance decisions foreclose them. The futures-oriented IS literature has established the epistemological warrant for such inquiry (Hovorka and Peter 2021b). What is missing is a specified method. I proposed scenario methodology from futures studies, grounded in epistemic friction: contested positions, normative conflict, and structured uncertainty. A corpus study of 4,320 scenarios showed that AI-generated futures systematically lose all three properties (Figure 3). Three process conditions specify when scenario methodology can serve as IS research evidence on human-AI coexistence. IS needs methods that match the temporal structure of its object (Wenzel 2022): decisions are made now; consequences unfold in futures that only friction-preserving methods can open to inquiry. Extensions follow: The Delphi results raise a follow-up question: under what conditions do experts detect friction loss, and when do they miss it? Answering this would produce evaluation criteria for IS reviewers assessing scenario-based research. The topic modeling results identify which thematic domains lose friction most severely under AI generation, pointing to where IS needs scenario-based inquiry most urgently. And a scenario-level analysis of the epistemic landscape would move the argument from corpus-level description toward individual scenario quality criteria. Taken together, these extensions move scenario methodology for IS from a programmatic proposal toward an empirically grounded methodological framework. The material exists; the next step is to build the criteria that let IS researchers use it.

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