THE

Innovation Jam Sessions™

A Knowledge Coordination Protocol for Cross-Disciplinary Problem-Solving

Methodology Brief with Field Evidence from Community Practice

Prepared for the Science & Engineering Community

Community Circle

Scaling Business Innovation for Humanity

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The coordination problem engineers know well

Complex systems fail not because individual components are poorly designed, but because interfaces between subsystems are misspecified. The same principle applies to multi-stakeholder innovation: when engineers, ecologists, community members, and traditional knowledge holders work on shared problems, the dominant failure mode is not lack of expertise — it is **interface failure between knowledge systems**.

Friedrich Hayek identified this precisely in a different context: the data of society is never given to one mind but exists as dispersed bits of incomplete and frequently contradictory knowledge among individuals. The challenge is not aggregating expertise — it is building coordination mechanisms that allow distributed, heterogeneous knowledge to produce coherent, actionable output without forcing epistemic assimilation.

> *"The engineering question is not "how do we get everyone to think the same way?" but "how do we design a protocol that extracts signal from distributed, heterogeneous knowledge systems?""*

A second, compounding problem: as AI and standardised design tools become dominant in innovation workflows, there is a risk of systematic convergence — solutions optimised for problem contexts well-represented in training data, while edge cases (including rural and Indigenous community contexts) are systematically underweighted. This is not a failure of intent; it is a distributional bias problem with structural causes.

Box 1 | THE WHOLE IS GREATER THAN THE SUM OF ITS PARTS

Lytton First Nation (Nickeyeah IR#25), British Columbia

What happened A decade-long boil water advisory had resisted prior technical interventions. The breakthrough came when leadership, operators, youth, residents, health authorities, funding agencies, consultants, manufacturers, and contractors were brought together as a unified knowledge system — not as sequential consultees. No single participant held the solution; the solution only became visible across the interface between them.

Why it matters *Hayek's insight holds: the data needed to solve the problem was dispersed across individuals and organisations. The coordination mechanism — not the expertise — was the missing component. The advisory was lifted in 2015.*

Box 2 | FORMING AN UNUSUAL PARTNERSHIP

Middle River (Tl'azt'en Nation), British Columbia

What happened A 14-year boil water advisory persisted in a remote community facing limited operator resources, power and connectivity challenges, and historically weak community engagement. Earlier solutions failed: a groundwater well was sealed after concerns over low levels of arsenic, while a sophisticated surface-water treatment plant was decommissioned because it required constant operator intervention and regular consumables. The eventual success came through a partnership of researchers, engineers, manufacturers, health and funding agencies, and community leadership working "beyond the mandate of their respective organisations."

Why it matters *Interface failure between knowledge systems — not technical inadequacy — was the root cause. Fourteen years of failure ended when the coordination mechanism changed.*

Why conventional methods fail at this interface

Standard approaches to multi-stakeholder knowledge integration — expert panels, structured surveys, stakeholder interviews, focus groups — share a common architecture: they are **sequential and filtered**. A facilitator or analyst mediates between knowledge systems, translating, summarising, and inevitably compressing. What is lost in compression is precisely what matters most: tacit knowledge, contextual dependencies, and the implicit rules that practitioners apply but rarely articulate.

Mathematicians may fail to account for technicians' operational constraints. Engineers and ecologists may lack shared vocabulary. Traditional knowledge holders and scientists may approach causality from incompatible frameworks. When these gaps remain unaddressed, two failure modes emerge:

- Solutions satisfy some knowledge systems while alienating others, producing adoption failure downstream
- Solutions that would require cross-epistemic synthesis never emerge at all — the design space is never fully explored

Hayek's insight about economic coordination is directly applicable: centralised aggregation of distributed knowledge — whether by a facilitator, an algorithm, or a planning committee — cannot substitute for the coordination mechanisms that allow many separate persons to cooperate. Innovation Jam Sessions™ are designed on the same architectural principle.

Box 3 | SHIFTING FROM SEQUENTIAL TO SIMULTANEOUS

Hupačasath First Nation (Kleekhoot Reserve), British Columbia

What happened The community had a clear technology preference — passive membrane technology developed at UBC, not yet commercially available — grounded in their operational requirements: simplicity, minimal maintenance, local operator capacity. A conventional sequential process would have filtered this preference out at the expert-specification stage. Instead, all parties prioritised ideas simultaneously, aligned with community vision. No consulting engineering firm was involved. At each iteration, community knowledge and innovator knowledge ran in parallel, not in series.

Why it matters *Sequential, filtered methods structurally exclude the community knowledge that most determines whether a solution will be adopted and sustained.*

Box 4 | BREAKING WITH TRADITION

Siska Indian Band (IR 5B), British Columbia

What happened The community faced documented historical reluctance to adopt changes proposed by outsiders. The partners broke with the standard request-for-proposal process entirely: Siska leadership met directly with manufacturers and contractors to evaluate and select preferred vendors. A consulting firm then used that manufacturer and contractor insight to reduce its billable hours for the community's benefit. The knowledge flow was structurally reversed.

Why it matters *When community knowledge is placed upstream of technical specification, adoption resistance dissolves — because the solution becomes an expression of community judgment, not an imposition upon it.*

The method: theatre as coordination protocol

Innovation Jam Sessions™ use research-based theatre as the coordination mechanism — not as a creative exercise, but as a structured protocol for surfacing, testing, and integrating distributed knowledge. The choice of theatre is not aesthetic; it is functional.

Making tacit knowledge explicit

Embodied enactment forces participants to externalise implicit rules. When an engineer and a Knowledge Keeper both enact "how water is managed in this valley," they are not describing their models — they are running them. The discrepancies that emerge are data: they reveal where assumptions diverge, where vocabulary is incompatible, and where one framework's "rule" produces outcomes another framework finds unacceptable.

Participants are collectively distinguishing lawlike generalisations — principles that express genuine causal necessity across contexts (Moravcsik) — from accidental universals that hold in one knowledge system but not another. This is precisely the kind of validation that single-discipline peer review cannot perform.

Box 5 | LEVERAGING A STALEMATE

T'it'q'et First Nation (Towinock IR#2), British Columbia

What happened Some community members had chlorine allergy and objected to mandatory chlorination — a direct conflict between regulatory science and lived community health experience. When community members and technical partners met directly and repeatedly to discuss treatment options, their implicit rules were externalised: the community's allergy knowledge was not a preference to accommodate but a constraint as binding as any engineering specification. The discrepancy drove a creative solution: ultraviolet primary disinfection with emergency-only chlorination.

Why it matters *Tacit knowledge only becomes data when it is externalised. Direct enactment of the problem makes implicit constraints explicit and actionable.*

Box 6 | TAKING A LONGER VIEW

Lhoosk'uz Dené Nation (Kluskus Village IR#1), British Columbia

What happened

The technical problem appeared straightforward: find and treat an alternative water source. But two deep-supply wells had elevated iron and manganese, were located in a historic burial area, and sat about 80 metres from a failing septic field. This shifted the focus from a short-term technical fix to a long-term sustainable solution, co-selected with the community and validated by health and funding authorities.

Why it matters *Community members running a system over decades hold temporal knowledge that visiting experts do not. Their long-horizon orientation is observational data about what sustainability actually requires in this context.*

Reflective equilibrium as iterative refinement

The process operates through reflective equilibrium — a method originally developed by Rawls and adapted to scientific reasoning by Føllesdal. The principle is bidirectional: rules are amended if they yield inferences we are unwilling to accept; an inference is rejected if it violates a rule we are unwilling to amend. Neither technical rules nor community knowledge is treated as fixed — both are subject to revision when they produce outcomes that another knowledge system finds unacceptable.

> *"Each enactment cycle is a test run. Discrepancies are not noise to be managed — they are the signal that drives model refinement."*

Box 7 | DISCOVERING COMMON GROUND

Lytton First Nation (IR3 Spintlum & IR11 Yawaucht), British Columbia

What happened Two reserves were living under boil water advisories but had been excluded from national assessments because their systems served fewer than five homes. A cross-institutional partnership conducted an iterative feasibility study for point-of-entry systems, testing water quality variation, demand, technology selection, monitoring plans, liabilities, and costs at each step. At each iteration, what partners were willing and unwilling to accept revised the shared model. The advisories were lifted in January 2017.

Why it matters *Reflective equilibrium is not consensus-seeking — it is bidirectional model revision. When partners test assumptions rather than defend them, the shared causal model converges on something none of them held individually.*

Box 8 | BUILD ON A VALIDATED LEARNING STRATEGY

ʔaq̓am Community (St Mary's Indian Band), British Columbia

What happened Many homes in the community had high iron, manganese, fluoride, or combinations of contaminants, with visible effects on plumbing, clothing, and skin. Rather than specifying a centralised solution, the project began with two homes receiving point-of-entry treatment systems, with ongoing monitoring of both water safety and system effectiveness. Each iteration refined the model against community experience. The pilot validated the pathway.

Why it matters *Iterative refinement treats discrepancies as signals, not failures. The pilot-first, monitor-continuously approach is the operational form of reflective equilibrium.*

Epistemic advantage at the margins

A counterintuitive but well-supported finding from standpoint epistemology (Wylie) is directly relevant to engineering contexts: those closest to a problem — particularly those at society's margins — often possess localised knowledge that significantly changes problem definition. This is not a social justice claim alone; it is a claim about information access.

Community members living with a system (a watershed, a power grid, a disease vector) have observational access that researchers and engineers do not. Their knowledge may be encoded in practice rather than formal models, but it is data-rich and causally grounded. Excluding it is not only unjust — it is a systematic information loss that degrades solution quality.

Box 9 | STUDYING BEST PRACTICES, TOGETHER

Van Anda Improvement District, Texada Island, British Columbia

What happened The community had spent years cycling through vendor-advocated solutions without resolution. The Community Circle intervention transferred investigative authority: the community organised an open house through which all residents became aware of design principles, treatment options, and trade-offs. The Board of Trustees developed the ability to answer what works, why, and how — because they had been the ones investigating.

Why it matters *Treating the community as co-investigator — not research subject — makes observational knowledge about failure modes, seasonal variation, and operational reality available to the design process.*

Box 10 | PRIORITIZING OUTCOMES, NOT FEATURES

Gillies Bay Improvement District, Texada Island, British Columbia

What happened The community's requirements were defined in terms of outcomes — remove natural organic matter and colour, achieve effective disinfection, meet budget, achieve long-term sustainability — not features. The project team deployed a mobile pilot plant to test granular activated carbon, biological activated carbon, ion exchange, and UV and chlorine disinfection in combination over 24 months.

Why it matters *Communities at the margins know what outcomes they need; they rarely know which technical features will produce them. Their observational knowledge reframes the engineering specification.*

Comparing approaches: a functional summary

Table 1 maps common knowledge-integration challenges to conventional approaches and the Innovation Jam Sessions™ alternative. Each row corresponds to a pattern appearing in the field evidence above.

Challenge	Conventional	Innovation Jam Sessions™
Knowledge gap	Facilitator translates between experts	Knowledge Keeper and Engineer enact together — discrepancies become data
Tacit knowledge	Compressed in interview transcripts	Externalised through embodied enactment in real time
Vocab. mismatch	Smoothed over in summary reports	Incompatible terms flagged as interface specs

Challenge	Conventional	Innovation Jam Sessions™
Epistemic authority	Defers to credentialed expert	Proximity to problem confers evidential weight
Iteration	Report → review → revision	Enactment → discrepancy → amendment
Output	Recommendations for community	Co-produced causal models owned by community
Adoption risk	High — community consulted	Low — community is co-generator

What the method produces

Innovation Jam Sessions™ are not discussion forums. They generate structured deliverables:

Shared causal models. Participants co-produce process maps identifying leverage points, causal pathways, and intervention opportunities that no single discipline could generate alone.

Validated generalisations. Cross-epistemic scrutiny distinguishes principles that hold across knowledge systems (genuinely lawlike) from those that are domain-specific (accidental universals).

Identified assumption conflicts. Explicit documentation of where frameworks diverge — the engineering equivalent of interface specification — allows downstream design to account for incompatibilities rather than discover them during implementation.

Community-owned frameworks. Because community members are co-generators rather than consultants, the resulting frameworks carry legitimacy and contextual accuracy that externally-produced models lack.

The method also produces process understanding: how change actually happens when multiple ways of knowing are integrated, what the sequence dependencies are, and where resistance is likely to emerge.

Box 11 | RAPID IMPLEMENTATION DURING EMERGENCIES

Zhiibaahaasing First Nation, Manitoulin Island, Ontario

What happened Flooding compromised the existing water plant during summer 2020. Community leaders, the water operator, and cross-sector partners conceived, designed, built, transported across the country, and delivered a replacement water treatment plant in three months. The plant was customised to the community's long-term infrastructure plan throughout the fabrication process. Community leadership and the operator were engaged at every stage.

Why it matters *Co-generation does not slow implementation — it accelerates adoption and prevents emergency solutions from becoming new legacy problems.*

KEY FINDING

Theatre workshops function as decentralised coordination mechanisms, allowing many separate actors to build shared understanding without requiring epistemic assimilation — much as Hayek's price system coordinates economic activity through distributed signals rather than central control.

Implications for engineering and technology partnerships

The practical case for incorporating Innovation Jam Sessions™ into technical innovation processes rests on three propositions:

- **Problem definition errors are the most expensive errors in engineering.** A method that systematically surfaces hidden assumptions reduces the risk of solving the wrong problem.
- **Adoption failure is common when communities are consulted rather than co-designing.** Solutions generated through genuine epistemic integration have higher implementation fidelity.
- **AI-driven design tools compound rather than solve these problems** if training data excludes marginalised community contexts. Human coordination protocols are a necessary complement, not a redundancy.

The methodology is not a replacement for technical rigour — it is a front-end coordination protocol that improves the quality of problem specification and solution validation before technical resources are committed. In systems engineering terms, it operates at the requirements and architecture phases, not the implementation phase.

> *"No single individual or organisation possesses all the knowledge needed to truly solve the fundamental problems that are specific and very likely unique to each Indigenous and rural community."*

NOTE FOR TECHNOLOGY PARTNERSHIPS

Innovation Jam Sessions™ are most effective when integrated at the problem-scoping phase. Retrofitting collaborative knowledge integration after technical specifications are set yields diminishing returns.

References and methodological sources

Theoretical foundations

Hayek, F. A. "*The Use of Knowledge in Society*." Distributed knowledge, decentralised coordination, and the limits of central planning.

Wylie, A. "*Pluralisms, Objectivity & Collaborative Practice in Archaeology*." Epistemic advantage at the margins, contingent credibility, external collaborations.

Rawls, J. / Føllesdal, D. "*The Emergence of Justification in Ethics*." Reflective equilibrium as a bidirectional method for scientific and ethical justification.

Moravcsik, J. "*All A's are B's: Form and Content*." Distinguishing lawlike generalisations from accidental universals.

Pratt, M. G. "*For the Lack of a Boilerplate*." Constructing explanatory process narratives from qualitative research themes.

Feyerabend, P. "*How to Defend Society Against Science*." Science as one tradition among many, shaped by historical contingency.

Taylor, M. Z. "*Does Culture Still Matter?*" Cultural factors shaping innovation ecosystems and national innovation rates.

Hoyningen-Huene, P. "*Objectivity, Value-Free Science and Inductive Risk*." Values and ethical considerations in scientific inquiry.

Field evidence

Field evidence panels draw on Community Circle's fifteen-year programme, documented in:

Community Circle / RESEAU-CMI. *Water Health Equity for Indigenous and Rural Communities.* Case Studies 1–14.

Community Circle. *Water Wellness, Economic Resilience: Reimagining Indigenous and Rural Futures Worldwide.* 2026.