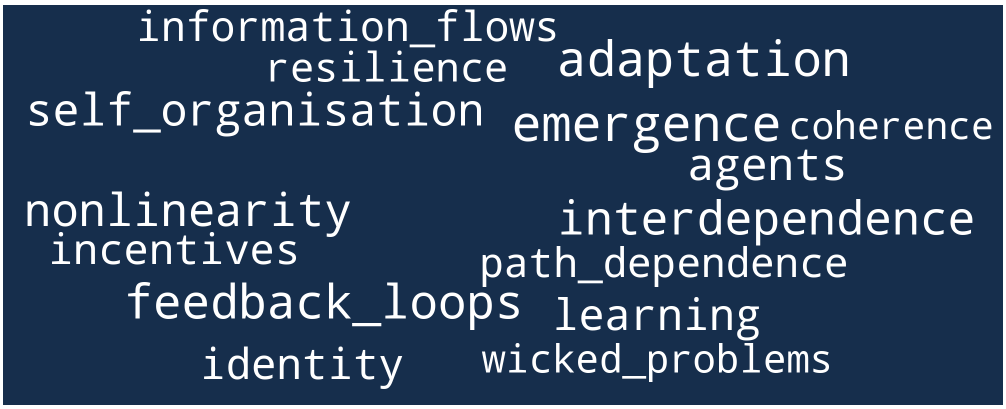

Wicked Problems

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Abstract

Contents

1 Introduction

Wicked Problems occupy a distinct and often misunderstood place in the landscape of complex human affairs. They arise in settings where diverse actors pursue overlapping but not identical aims, where information is incomplete or contested, and where interventions alter the very conditions they seek to improve. Unlike technical problems, which can be stabilised long enough to permit analysis, Wicked Problems resist simplification. Their boundaries shift, their terms evolve and their consequences unfold through the interactions of people, institutions and environments. They are not puzzles waiting to be solved but manifestations of systems in motion.

Although the term "Wicked Problem" originated in planning theory, the underlying dynamics reflect principles observed across the study of complex adaptive systems. In both domains, behaviour emerges from interaction rather than instruction, and change is shaped by feedback, learning and adaptation. Wicked Problems, however, add an explicitly social dimension: they are inherently value-laden, politically situated and shaped by conflicting interpretations of what the problem is and what counts as progress. A Wicked Problem is therefore never merely a technical challenge; it is a contested social reality unfolding within a complex system.

This paper examines Wicked Problems through this dual lens. It treats wickedness not simply as a list of characteristics but as an ontology—a way of understanding what these problems *are*, how they arise, and why they persist. By articulating the social, emergent, multi-causal and reflexive nature of Wicked Problems, the aim is to move beyond the familiar diagnostic lists and toward a deeper account of their structure. Such an account enables a more coherent view of why traditional planning methods struggle, why prediction falters, and why efforts at resolution frequently generate unintended consequences.

Understanding Wicked Problems in this ontological sense is not an academic exercise. It provides a foundation for practice. If Wicked Problems emerge from plurality, then methods must support negotiation and shared interpretation. If they evolve through feedback, then approaches must be iterative and adaptive rather than linear. If they are shaped by institutional structures, then governance and memory become as important as analysis. Working with Wicked Problems therefore requires approaches that acknowledge their complexity without collapsing it.

The sections that follow build this argument in stages:

- First, the social ontology of Wicked Problems is developed, showing how interpretation, values and institutional framing constitute the problem itself.
- Second, the emergent character of wickedness is examined, connecting it to the adaptive and nonlinear behaviours observed in complex systems.
- Third, the multi-causal, multi-perspectival and temporally open nature of Wicked Problems is described, highlighting why they resist reduction to discrete variables or fixed models.
- Finally, the paper considers approaches that are compatible with this ontology—collaborative, iterative and reflexive methods that seek progress rather than closure.

Taken together, these elements present Wicked Problems not as outliers in human affairs but as characteristic expressions of systems in which meaning, action and structure intertwine. To understand them is to understand something essential about how real-world systems behave when many forces interact.

2 Ontology

2.1 Social Ontology

Wicked Problems cannot be reduced to technical puzzles awaiting the correct analytical method. Their defining feature is that they arise through the interpretive, social and political processes of the systems in which they occur. Rittel and Webber made this foundational: in the public realm, the problem is inseparable from the actors who define it [12]. What counts as a problem, which outcomes matter, and who is affected are not objective properties of a situation but products of meaning-making within a social world. Unlike technical problems, whose structure can be examined independently of those analysing them, Wicked Problems possess no determinate form outside human interpretation.

This perspective echoes Churchman's insight that planners are never outside the systems they seek to improve [3]. Their assumptions, commitments and institutional positions shape both their understanding of the situation and the boundaries within which solutions appear thinkable. Schön later argued that problem-setting is the central act of professional practice, not a step preceding "real" problem-solving [13]. Together these insights reveal a core property: Wicked Problems cannot be stabilised long enough to reveal a single, authoritative formulation. Different stakeholders inhabit different slices of the system and therefore perceive different problems. This divergence is not an obstacle to be corrected but a constitutive feature of the problem's ontology.

2.2 Emergent Ontology

Wicked Problems are not static objects awaiting diagnosis; they come into being through interaction. As actors interpret events, pursue interests, revise strategies and respond to one another, the problem itself changes. A wicked problem is therefore emergent rather than fixed: what "the problem" appears to be at any moment is a temporary configuration of interpretations, incentives and system behaviours. The same named issue at two points in time may, under scrutiny, be a different problem entirely.

This emergent quality parallels the behaviour of complex adaptive systems, where global patterns arise from local interactions rather than central design [4, 7]. But in wicked settings, emergence is mediated by meaning. A policy shift, new technology or change

in leadership alters not only behaviours but the interpretive landscape: what people believe the problem is, what they fear, what they hope for and what they consider feasible. Feedback loops—across public perception, institutional incentives, political commitments and resource flows—continually reshape the problem. Rittel and Webber captured this succinctly: every attempted solution changes the situation irreversibly, producing new problem formulations that must be addressed in turn [12]. In such conditions, prediction becomes limited, not for lack of data but because the system evolves in response to the very attempts to influence it.

2.3 Institutional / Organisational Ontology

Organisations play a decisive role in shaping how Wicked Problems are perceived and acted upon. They do not encounter problems as neutral observers. Instead, they construct them through routines, incentives, boundaries, professional norms and embedded narratives. Majone noted that policy reasoning is never purely empirical: arguments are evaluated through the institutional commitments and value-laden assumptions that underpin them [11]. Head extends this by showing how institutions actively participate in producing the form of Wicked Problems—determining what is visible, what is obscured and what counts as credible action [6].

Information in such systems is not simply processed; it is filtered. Some signals are amplified, others suppressed. Distinctions between the formal and informal organisation, between strategic priorities and operational constraints, and between politically safe and unsafe interpretations shape what can be attended to. As these filters shift—through leadership changes, crises, public pressure or bureaucratic evolution—the perceived nature of the problem shifts with them. A wicked problem is therefore partly an artefact of organisational perception. Its ontology cannot be separated from the cognitive, structural and political processes through which organisations define their world.

2.4 Normative / Value Ontology

The ontology of Wicked Problems is also irreducibly normative. They persist not only because of complexity or uncertainty but because they arise within systems characterised by incompatible values, purposes and moral commitments. Grint observes that

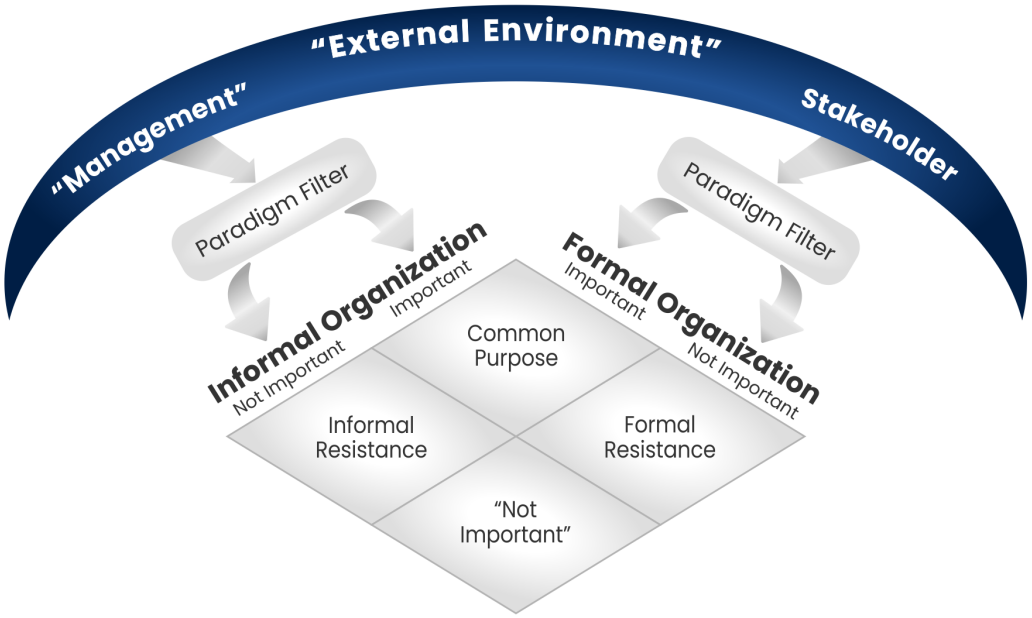

Figure 1: How do you create a common purpose?

Wicked Problems emerge precisely where no authoritative frame exists to adjudicate between competing interpretations of what the problem is or why it matters [5]. For some actors, the issue is one of fairness; for others, efficiency; for others, risk, identity or moral obligation. Each perspective generates a different understanding of what counts as evidence, harm, progress or legitimacy.

Benford and Snow show that such conflicts take the form of frame contests, in which groups construct narratives that privilege particular causal explanations, identities and solutions while marginalising alternatives [1]. These interpretive struggles do not occur around a stable underlying problem; they constitute the problem. Value pluralism ensures that no single formulation can command universal assent, and no metric exists by which all competing claims can be reconciled. A wicked Problem therefore exists not simply in the world but in the sociopolitical and moral terrain through which meaning, legitimacy and action are negotiated.

3 Interpretation and problem construction

Wicked Problems do not present themselves to practitioners as pre-formed objects awaiting diagnosis. They must be interpreted, and in the very act of interpretation they are partially constructed. This stands in contrast to technical problems, whose structure exists independently of the analyst.

A Wicked Problem does not reveal a stable form prior to engagement; the process of observing, naming and framing it alters what the problem becomes. The observer is not outside the system but a participant in the conditions that bring the problem into being. Rittel and Webber highlighted this when they argued that in the public realm the "problem" is inseparable from those who define it [12]. Interpretation is therefore not an adjunct to problem-solving; it is constitutive of the problem's existence.

Meaning emerges through processes of framing. Actors foreground some elements of a situation while backgrounding others, drawing on histories, identities, institutional logics and moral commitments. These frames determine which aspects of reality become salient, how causal relationships are understood and what counts as a legitimate or desirable form of action. Benford and Snow show that such framing processes shape collective understanding by privileging particular causal stories while marginalising alternatives [1]. A wicked problem is thus not a stable configuration of facts but a contested field of meaning. What appears self-evident to one stakeholder may be incomprehensible or irrelevant to another, and these divergences are not errors: they reflect the plural social worlds through which meaning is constructed.

Interpretive plurality also arises from the positionality of actors within the system. Churchman observed that planners are unavoidably entangled in the systems they seek to change [3]. Their institutional affiliations, professional traditions and personal commitments shape how they see the world, what they consider important and which solutions they find credible. Schön extends this argument by demonstrating that problem-setting is a reflective, iterative process through which practitioners make sense of ambiguous situations and stabilise them long enough to act [13]. Meaning, in this view, is neither fixed nor given; it is negotiated, revised and continually re-made.

Institutional environments further structure interpretation by filtering what can be attended to. Organisations amplify certain signals and suppress others, shaping the interpretive horizon available to their members. Head shows how routines, administrative categories and political imperatives determine what is recognised as a problem and what remains invisible [6]. These filtering processes create path dependencies: once a particular formulation becomes dominant, alternative interpretations become harder to articulate or sustain. Meaning is therefore not only personal or cultural but organisational and systemic.

The construction of a wicked problem is also shaped by the temporal dynamics of the system. As actors learn, argue, adapt and respond to one another, the meaning of the problem shifts. A reform initiative may change incentives; changing incentives may alter behaviour; altered behaviour may shift public perceptions; shifting perceptions may redefine the political landscape. At each stage, the problem is reinterpreted and reconstructed. What appears as continuity in naming may conceal profound discontinuity in meaning. A wicked problem is therefore a moving target, not because analysts fail to grasp its essence, but because its essence is emergent and relational.

To understand interpretation in wicked settings is to recognise that meaning is not an optional extra added after the "real" problem has been discovered. Meaning is the medium through which the problem becomes intelligible at all. Analysts and practitioners do not merely uncover the problem; they participate in its construction. This does not imply that Wicked Problems are arbitrary or unconstrained—real consequences, harms and dependencies exist—but it does mean that the form these take is inseparable from how they are understood. An adequate account of Wicked Problems therefore requires attention not only to system behaviour but to the interpretive processes through which situations become problems, actors become stakeholders and issues become matters of public concern.

4 Problem dynamics and the instability of boundaries

Wicked Problems do not stand still. Once brought into view through interpretation and institutional attention, they begin to move. Policies are proposed, resisted and revised; coalitions form and dissolve; resources are reallocated; external conditions change. Each move alters the configuration of relationships, incentives and expectations within the system. What appears at first as a single, bounded problem gradually reveals itself as a shifting field of interdependencies whose contours refuse to stabilise. Boundaries that initially seemed clear become porous, leak into adjacent domains or collapse altogether. The dynamics of Wicked Problems are therefore defined as much by the instability of their boundaries as by the complexity of their internal structure.

This instability reflects the underlying behaviour of complex adaptive systems. In such systems, global patterns arise from local interactions rather than central design, and feedback loops continually reshape the conditions under which actors operate [4, 7]. Wicked Problems inherit these properties but layer onto them the additional complications of meaning, power and institutional structure. A change intended to address one aspect of the problem alters incentives elsewhere, which reshapes behaviour, which shifts interpretations, which in turn modifies the political and organisational context in which further decisions are made. Rittel and Webber captured this recursive quality when they argued that every attempted solution to a wicked problem leaves the world in a different state, generating new problem formulations that must themselves be confronted [12]. There is no stable baseline to which the system can be returned.

The boundaries of wicked problems are further destabilised by the way organisations partition responsibility. Administrative structures divide reality into sectors—health, education, housing, finance, security—each with its own mandates, metrics and time horizons. Wicked Problems cut across these domains. Attempts to address them from within a single organisational silo often displace pressures rather than resolving them, exporting costs or risks to other parts of the system. Head notes that institutions both reflect and reinforce these divisions, creating “boundary regimes” that shape who is authorised to act on which aspects of a problem and with what instruments [6]. As initiatives unfold, these regimes are strained, stretched and occasionally reconfigured, altering the effective boundaries of the problem in ways that are difficult to predict from the outset.

Temporal dynamics compound this instability. Wicked Problems evolve on multiple timescales: some effects appear quickly, others unfold slowly; some interventions produce immediate visible changes, others yield delayed consequences that only become apparent years later. Short political cycles, performance regimes and budget horizons encourage attention to near-term, measurable outcomes, often at the expense of longer-term system behaviour. Churchman warned that planners become part of the problem by privileging certain timescales and perspectives over others [3]. In wicked contexts, this temporal selectivity can lock systems into patterns that are difficult to escape. Efforts to stabilise one boundary—for example, by freezing a definition to meet a reporting requirement—may create new forms of drift elsewhere as actors adapt in ways that were not anticipated.

Conflict and contestation also drive boundary shifts. As different stakeholders advance competing interpretations of the problem, they implicitly redraw its limits. Grint observes that Wicked Problems are most visible where leaders cannot command a single authoritative framing of what is at stake [5]. Each framing brings different actors into focus, foregrounds some causal pathways and backgrounds others, and locates responsibility within different parts of the system. Benford and Snow show how such framing contests shape collective action, expanding or contracting the perceived scope of a problem as groups struggle over meaning [1]. A wicked problem's boundaries therefore move with the balance of interpretive power: when one frame gains traction, the problem appears to narrow; when alternative frames reassert themselves, it expands again.

These dynamics challenge the assumption that a problem can be cleanly defined at the outset, analysed within fixed boundaries and then addressed through a sequence of planned interventions. In wicked settings, the act of intervention feeds back into the system in ways that alter both the problem and its boundaries. New actors may enter the field; existing actors may exit or change their stance; unintended consequences may create fresh issues that attach themselves to the original problem, increasing its scope or changing its nature. Attempts to insulate a domain—for instance, by limiting the remit of a reform to "operational" matters—often fail because the system's behaviour is generated by interactions that cross those artificial lines.

Recognising the dynamic and unstable character of boundaries does not imply that analysis is futile. It does, however, shift the focus from seeking definitive formulations to tracing patterns of coupling and decoupling over time. Rather than asking where the problem definitively begins and ends, practitioners must ask how boundaries are being drawn, by whom, for what purposes and with what consequences. They must attend to where feedback is accumulating, where delays are masking emerging risks and where local fixes are displacing pressures onto other parts of the system. In this sense, the dynamics of Wicked Problems invite a move from static mapping to ongoing cartography: the system must be re-mapped as it changes.

A dynamic view of Wicked Problems has direct implications for practice. It suggests that efforts to impose premature closure—by fixing definitions, freezing boundaries or insisting on singular lines of accountability—may provide short-term reassurance at the cost of long-term adaptability. It also implies that governance arrangements must be capable of revisiting problem framings, revising institutional boundaries and adjusting interventions as new patterns emerge. The task is not to eliminate boundary instability but to develop the capacity to work with it: to recognise when boundaries are shifting, to understand how those shifts are driven by interaction and interpretation, and to adjust collective action accordingly. In wicked domains, stability lies not in the problem but in the quality of the system's ongoing response.

5 Causality, explanation and the limits of prediction

Wicked Problems unsettle the conventional assumptions that underpin causal analysis. In well-structured technical domains, causes can be isolated, effects traced and predictions generated with reasonable confidence. The problem can be decomposed into component parts, each governed by stable relationships. Wicked Problems resist such treatment. Their causal structure is diffuse, interdependent and continually reconfigured by the actions and interpretations of the actors within the system. As a result, explanation becomes difficult and prediction uncertain—not because analysts lack skill or information, but because the system itself does not exhibit the stable regularities on which predictive reasoning depends.

This difficulty begins with the distributed nature of causality. No single variable or actor exerts decisive control; instead, outcomes arise from the patterned interaction of many elements across multiple levels of the system. Feedback loops amplify some effects and dampen others, creating behaviour that is sensitive to history, timing and context. Small changes in one part of the system can cascade into disproportionate effects elsewhere, while apparently significant interventions may have little impact. Efforts to establish linear causal pathways therefore capture only fragments of a wider ecology of interaction. As Holland and others have shown in the study of complex adaptive systems, global behaviour cannot be inferred by analysing components in isolation [4, 7]. Wicked Problems inherit this non-decomposability and add to it a layer of interpretive instability.

Interpretation matters because causal relations in wicked settings are mediated through human perception, judgement and meaning-making. What counts as a cause depends on the frame through which actors view the situation. A rise in waiting times in a public service system, for example, may be attributed by one group to resource shortages, by another to organisational inefficiencies and by a third to changes in user expectations or broader socioeconomic pressures. Each explanation foregrounds different mechanisms and identifies different levers for action. None can be validated independently of the assumptions and values underpinning the frame.

As Schön argued, practitioners in such settings operate not by discovering pre-given causal chains but by constructing plausible narratives that render complex situations intelligible long enough to act [13]. Causality in Wicked Problems is therefore partly an interpretive accomplishment rather than an objective mapping of system relations.

The limits of prediction follow from this causal and interpretive complexity. Wicked Problems evolve as actors respond to each other's behaviour, to policy interventions and to changes in the wider environment. Forecasts shape expectations; expectations shape behaviour; behaviour reshapes the system that the forecast sought to anticipate. In such reflexive settings, the conditions required for reliable prediction—stable structures, closed boundaries and independence between observation and system behaviour—do not hold. Churchman warned of the paradox that planners become part of the very system they seek to understand [3]. Their models, decisions and measurements feed back into the environment, altering incentives and perceptions in ways that undermine the assumptions on which those models initially rested.

Attempts to stabilise causality through tighter control or more detailed measurement often exacerbate these difficulties. Performance indicators may change behaviour in unintended ways; interventions may displace pressures to other parts of the system; attempts to reduce uncertainty may generate new uncertainties through adaptive responses. As Rittel and Webber noted, every intervention produces irreversible effects that alter the structure of the problem [12]. Under such conditions, prediction becomes less a matter of projecting future states and more a matter of anticipating how different actors will interpret, respond to and reshape the evolving landscape. The question shifts from "What will happen?" to "How will the system behave as it co-evolves with our actions?"

Explanation, too, must adapt to these realities. Rather than seeking single, definitive causal accounts, practitioners must work with multiple, partial narratives that capture different facets of system behaviour. They must trace the interplay between structural dynamics and interpretive processes, recognising that causes are not merely mechanical relations but socially mediated understandings of how events hang together. This does not reduce explanation to relativism. It requires disciplined attention to evidence, but also awareness of how evidence is interpreted within different frames and how causal stories gain or lose authority within institutional settings.

A more appropriate approach to causality in Wicked Problems therefore foregrounds patterns, mechanisms and interactions rather than linear chains. It emphasises the conditions under which certain behaviours emerge, the feedback processes that sustain them and the points at which small interventions may trigger larger shifts. It also demands reflexivity: an awareness of how the analyst's own framing, measurement practices and interventions influence the system. Prediction in this mode is not about forecasting precise outcomes but about anticipating plausible trajectories, potential tipping points and the adaptive responses that might follow from different courses of action. In wicked domains, understanding is less a matter of achieving certainty than of developing the capacity to navigate uncertainty with insight and humility.

6 Working with, rather than, solving

To engage with Wicked Problems is to accept that they cannot be solved in the conventional sense. Their boundaries shift, their meanings are contested, and their dynamics co-evolve with the actions taken upon them. Attempts at definitive resolution fail not because practitioners lack expertise, but because the problem itself does not stabilise long enough for closure. This produces a necessary shift in posture: from the pursuit of solutions to the practice of working *with* the problem as an evolving sociopolitical system.Working with a wicked problem begins with recognising that no actor holds a complete view of the issue. Different groups inhabit different institutional positions, interpretive frames and temporal horizons. As Head notes, progress requires creating conditions in which these partial perspectives can be brought into productive relation rather than forced into premature consensus [6]. This is less a matter of analysis than of enabling interaction. The practitioner's task becomes one of convening, framing and maintaining dialogue across plural viewpoints, acknowledging that each contributes to the construction of the problem and its possible futures.

In this context, expertise remains important but no longer functions as a privileged vantage point outside the system. Grint emphasises that complex and Wicked Problems demand a shift from authoritative, "command" forms of leadership to more collaborative, inquiry-driven modes [5]. Technical knowledge informs action, but it cannot determine it. Instead, working with Wicked Problems involves aligning diverse forms of knowledge—professional, experiential, political—into a shared, if provisional, understanding of the system and its constraints. This alignment is not an endpoint but a recurrent accomplishment that must be remade as conditions evolve.

A second requirement is the cultivation of adaptive capacity. Because Wicked Problems produce unintended consequences and irreversibly alter the situation in which they occur, practitioners must build strategies that can absorb surprise rather than collapse under it. This reflects lessons learned from complex adaptive systems, where feedback and non-linearity make prediction unreliable [7].

Instead of seeking optimal solutions, organisations must establish iterative cycles of action, observation and adjustment. Schön's notion of "reflection-in-action" captures this shift: practitioners learn by acting, interpreting the effects of their interventions and revising their understanding accordingly [13]. In wicked domains, learning is insep-

arable from doing.

Institutional context also shapes what it means to work with Wicked Problems. Organisations filter information, impose boundaries of responsibility and privilege certain interpretations over others. These constraints cannot be removed, but they can be made explicit. As Majone argues, policy reasoning is inherently normative, and progress depends on surfacing the values and assumptions embedded within institutional practice [11]. Working with Wicked Problems therefore requires institutional reflexivity: the ability of organisations to examine how their own routines, incentives and structures contribute to the persistence or evolution of the issue. Without such reflexivity, interventions risk reinforcing the very dynamics they seek to alter.

Finally, working with Wicked Problems involves sustaining legitimacy as much as achieving outcomes. Because stakeholders disagree about what the problem is and what should be done, the process by which action is taken becomes as significant as the action itself. Benford and Snow show that competing frames influence whether actors perceive interventions as credible, fair or meaningful [1]. Progress therefore depends on maintaining a process that actors recognise as legitimate, transparent and responsive to their concerns—even when substantive agreement remains elusive. Legitimacy stabilises relationships long enough for adaptive work to continue.

Taken together, these practices constitute a distinctive mode of engagement. To work with a wicked problem is to navigate its plurality rather than resolve it; to adapt rather than predict; to convene rather than command; and to generate shared meaning rather than impose a single frame. This stance does not eliminate complexity. Instead, it equips practitioners to inhabit it: to act purposefully within systems that cannot be controlled, to learn from consequences that cannot be foreseen, and to maintain coherence in environments where consensus is neither available nor necessary. It is within this practical orientation that more formal exploratory tools—including those introduced in the following section—find their proper place.

7 Traditional approaches to “Solving”

Efforts to address Wicked Problems have frequently relied on methods developed for domains where problems can be clearly defined, analysed and resolved through linear reasoning. These conventional approaches persist not because they succeed in wicked environments, but because they promise clarity and control in systems that resist both. Understanding their limitations is essential before more adaptive and reflexive forms of inquiry can be articulated.

7.1 Technical Rationality

The most enduring traditional approach is the model of technical rationality. Here, it is assumed that the problem possesses an underlying structure that can be discovered through expert analysis, after which an optimal solution can be designed and implemented. This model emerges from engineering and classical planning traditions, where the separation between analysis and action is stable and the problem remains constant while the solution is developed. Rittel and Webber famously critiqued this logic, arguing that in public and organisational settings the very act of formulating the problem is a political and interpretive act that alters the situation [12]. Churchman went further, warning that the systems analyst is never external to the system and that the search for an objective, technical solution can obscure the moral and institutional dynamics that constitute the problem [3]. Despite these critiques, the belief that more data and better analysis will reveal the correct solution remains deeply embedded in policy practice.

A brief aside is warranted here. Systems thinkers often turn to causal loop diagrams as a first step in engaging with complex problems, using feedback structures to expose unintended consequences, reinforcing dynamics and time delays. Such diagrams can quickly reveal why linear, problem–solution models fail. However, while CLDs illuminate structure, they do not resolve the interpretive, political and institutional dimensions that distinguish Wicked Problems from technical complexity. They are diagnostic, not prescriptive.

7.2 Goal-Based Planning

A second traditional response has been to impose fixed goals, milestones and performance indicators on situations that cannot be stabilised. Goal-based planning assumes that clarity of objectives precedes effective action and that the task of management is to align activities with predefined outcomes. Such assumptions derive from rational–comprehensive planning models, in which planners identify goals, generate alternatives and evaluate outcomes through systematic analysis. Schön challenged this model directly, emphasising that in conditions of uncertainty and conflict, goals emerge through action rather than prior to it [13]. In wicked contexts, premature goal specification can narrow perception, suppress disconfirming information and harden institutional commitments around frames that later prove untenable.

7.3 Authoritative Decision-Making

Where disagreement is pronounced, organisations often revert to authoritative, top-down decision-making. Here, a senior figure or institution determines the problem definition and imposes a course of action. Grint argues that such command models are appropriate for "tame" problems—where causality is stable and authority uncontested—but fail in wicked settings [5]. Authoritative resolution suppresses the interpretive plurality that gives rise to the problem. It may secure compliance, but it rarely secures legitimacy or shared understanding. Moreover, top-down interventions risk escalating conflict, particularly when they undermine the perspectives or interests of actors whose cooperation is necessary for subsequent action.

7.4 Incrementalism

Incrementalism represents a more cautious approach. Lindblom famously described policy-making as "muddling through," a process of making small, reversible moves in the absence of clear knowledge or agreement [10]. Incremental strategies can be appropriate under uncertainty, but they are insufficient when the problem requires reframing rather than adjustment. Incrementalism may stabilise an unsatisfactory equilibrium or reinforce institutional path dependencies, limiting the system's capacity to recognise or act on underlying contradictions. In wicked settings, small steps may entrench the very constraints that preserve the problem.

7.5 Modelling and Quantification

A final traditional approach involves the use of analytical or computational models to represent the system. Modelling can illuminate particular dynamics—especially in complex adaptive systems, where non-linearity and emergence make intuitive reasoning unreliable [7]. However, Wicked Problems possess additional features that modelling alone cannot capture: contested meanings, strategic behaviour, institutional filtering and shifting frames of interpretation. Checkland's critique of "hard systems" methods remains relevant: formal models can be misleading when applied to systems whose boundaries and goals are matters of debate rather than technical definition [2]. Models can clarify aspects of the system, but they cannot stabilise a problem whose identity is itself contested.

Recent developments in modelling have sought to address some of these limitations by explicitly acknowledging deep uncertainty. Approaches commonly grouped under the heading of exploratory modelling and decision making under deep uncertainty abandon point prediction in favour of examining system behaviour across a wide range of plausible assumptions. Rather than optimising for a single expected future, they assess the robustness of policy options under diverse scenarios, recognising that key parameters, causal relationships and external conditions may be unknown or contested [8, 9]. In this respect, such approaches represent a significant advance over deterministic or forecast-driven models, particularly in settings characterised by non-linearity and long-term uncertainty.

However, despite this sophistication, exploratory modelling remains constrained by assumptions that limit its applicability to Wicked Problems. Most importantly, these approaches presuppose a stable problem framing. While uncertainty is explored within the model, the boundaries of the system, the definition of outcomes, and the criteria by which performance is judged are typically fixed in advance. In wicked settings, these elements are not merely uncertain but actively contested and subject to ongoing reinterpretation. Disagreement over what the problem is, whose interests matter, and what constitutes harm or success cannot be resolved by sampling across parameter space.

Exploratory modelling also brackets the reflexive effects of modelling itself. The act of constructing, communicating and legitimising a model influences how actors understand the problem, how authority is distributed and how future actions are shaped.

These feedback effects are central to the dynamics of Wicked Problems but lie largely outside the representational scope of quantitative exploration. As a result, while exploratory modelling can illuminate sensitivities within an agreed frame, it cannot interrogate the stability or legitimacy of the frame itself.

For these reasons, even the most advanced modelling approaches encounter limits when applied to Wicked Problems. They remain valuable analytical instruments, capable of revealing patterns and stress-testing assumptions, but they cannot substitute for forms of inquiry that treat problem framing, interpretation and institutional context as objects of investigation in their own right.

7.6 Synthesis

Across these traditional approaches, a common set of assumptions emerges: that the problem is objective and definable; that its boundaries can be stabilised; that expertise can determine an appropriate solution; and that implementation will unfold without altering the problem in unpredictable ways. Each assumption is at odds with the ontology of Wicked Problems. Conflicting interpretations, institutional constraints, value pluralism and emergent dynamics ensure that the problem cannot be separated from the system that constitutes it. Attempts to "solve" Wicked Problems using traditional methods generate frustration, unintended consequences and resistance not because the methods are poorly applied, but because they are grounded in the wrong ontology.

Recognising the limitations of conventional approaches opens the space for more appropriate forms of engagement. Working with Wicked Problems requires forms of inquiry that acknowledge interpretive plurality, institutional complexity and emergent behaviour, without assuming that these can be eliminated. Such inquiry must navigate a central tension: while Wicked Problems cannot be stabilised in any final or authoritative sense, learning and collective deliberation nevertheless require moments of temporary coherence. In the following section, we outline an approach designed to explore Wicked Problems without collapsing their intrinsic uncertainty: stabilising the problem long enough to interrogate it, perturbing its structures and assumptions, and learning from the consequences.

8 Provisional stabilisation and exploratory inquiry

If Wicked Problems cannot be stabilised in any final or authoritative sense, it does not follow that they cannot be stabilised at all. To work with such problems requires navigating a tension between ontological instability and epistemic necessity. On the one hand, Wicked Problems evolve through interpretation, interaction and feedback, resisting any attempt to hold them still. On the other, inquiry, learning and collective deliberation require some degree of temporary coherence. Without it, systems remain opaque, disagreement proliferates and action collapses into reaction. The challenge, therefore, is not whether to stabilise a wicked problem, but how to do so without mistaking provisional order for underlying truth.

This section introduces a mode of engagement that treats stabilisation as an explicitly epistemic manoeuvre rather than an ontological claim. The aim is not to define the problem correctly or to impose closure, but to suspend its motion long enough to interrogate its structure, assumptions and sensitivities. Such stabilisation is provisional by design. It is bounded in time, acknowledged as partial and undertaken with full awareness that the problem will resume its evolution once inquiry gives way to action. In this sense, stabilisation functions as a temporary bracket placed around a moving system, allowing aspects of its behaviour to be examined without pretending that the bracketed state is real, complete or enduring.

The need for such a move arises directly from the limitations of traditional approaches discussed earlier. Technical rationality seeks stability by assuming it; goal-based planning enforces it through targets; authoritative decision-making asserts it through power; modelling approximates it through abstraction. Each approach treats stability as either given or achievable. In wicked settings, this assumption is precisely what fails. Provisional stabilisation, by contrast, begins from the opposite premise: that instability is fundamental, but that inquiry nevertheless requires moments of artificial stillness. The legitimacy of the move lies not in its fidelity to reality, but in its transparency and reversibility.

Once a problem has been provisionally stabilised, it becomes possible to engage in exploratory inquiry through deliberate perturbation. Here, perturbation should not be understood as intervention in the operational sense, nor as an attempt to optimise outcomes. Rather, it functions as a form of structured questioning. By altering as-

sumptions, boundaries, incentives or interpretations within the stabilised frame, practitioners can explore how the system might respond if key elements were different. The purpose is not to predict what will happen, but to surface relationships, dependencies and sensitivities that remain hidden while the problem is in motion. Perturbation, in this sense, is a way of learning about the system's topology rather than its future trajectory.

This exploratory use of perturbation distinguishes the approach from scenario planning and simulation. Scenarios typically explore alternative futures under differing assumptions, but they often inherit a fixed framing of the problem itself. Models can reveal non-linear dynamics, but they require prior decisions about boundaries, variables and goals. Provisional stabilisation makes those decisions themselves the object of inquiry. By holding a particular framing steady and then deliberately unsettling it, practitioners can examine how much of the system's apparent behaviour depends on that framing and where interpretive or institutional choices exert disproportionate influence. What is revealed are not solutions, but fault lines: points at which small changes in interpretation or structure produce large shifts in meaning, legitimacy or behaviour.

Crucially, both stabilisation and perturbation are undertaken in full recognition of reflexivity. The act of inquiry feeds back into the system it seeks to understand. Insights generated through exploration may alter how actors interpret the problem, which in turn reshapes subsequent dynamics. This does not invalidate the approach; it defines its limits. Provisional stabilisation is not a neutral analytical step preceding action, but part of the system's ongoing evolution. Its value lies in making that influence explicit rather than implicit, and in enabling learning that would otherwise be inaccessible amid continuous flux.

The contribution of this approach is therefore modest but significant. It does not offer a method for solving Wicked Problems, nor a technique for controlling complex systems. Instead, it provides a disciplined way of creating temporary epistemic footholds within systems that cannot be made stable. By distinguishing between ontological claims about what a problem is and epistemic moves that enable inquiry, it becomes possible to explore Wicked Problems without collapsing their intrinsic uncertainty. Different contexts will require different ways of operationalising this posture, depending on institutional constraints, decision demands and forms of accountability. What remains constant is the recognition that learning in wicked domains depends not on eliminating instability, but on knowing when and how to work momentarily against it.

9 Conclusion

Wicked problems resist resolution not because they are poorly understood, but because they arise from systems in which meaning, action and structure co-evolve. Their instability is not an accidental feature to be overcome through better analysis or stronger authority; it is a constitutive property of social systems characterised by plural values, institutional fragmentation and adaptive behaviour. To approach such problems as if they were stable objects awaiting solution is therefore to misrecognise their nature and to invite frustration, unintended consequences and loss of legitimacy.

This paper has argued that Wicked Problems are best understood ontologically rather than diagnostically. They are not defined by a checklist of attributes but by the conditions under which they emerge and persist: interpretive plurality, emergent dynamics, reflexivity and contested boundaries. These conditions undermine the assumptions that underpin traditional approaches to problem-solving, including technical rationality, optimisation, authoritative decision-making and even the most sophisticated forms of modelling under uncertainty. The limitations of these approaches are not primarily technical. They are ontological.

Recognising this shifts the task from solving Wicked Problems to working with them. Working with Wicked Problems requires forms of engagement that can accommodate instability without denying it, that can support learning without assuming convergence, and that can sustain legitimacy in the absence of closure. It demands attention not only to system behaviour but to the interpretive and institutional processes through which

problems are constructed, contested and reconfigured over time.

Within this frame, the paper has introduced provisional stabilisation and exploratory inquiry as an epistemic move rather than a method or solution. By distinguishing between ontological claims about what a problem is and epistemic practices that enable inquiry, it becomes possible to create temporary footholds within systems that cannot be made stable. Such footholds allow practitioners to interrogate assumptions, explore sensitivities and surface latent structures without mistaking provisional coherence for underlying truth. The value of this move lies not in prediction or control, but in learning.

The implications of this perspective extend beyond any single technique or context. They suggest that competence in wicked domains is less a matter of selecting the right solution than of cultivating the capacity to sustain inquiry over time: to revisit framings, to adapt institutional responses, and to learn from the consequences of action without insisting on finality. In settings where closure is neither available nor desirable, progress depends on the quality of collective sense-making rather than on the promise of resolution.

Wicked Problems, understood in this way, are not aberrations at the margins of social life. They are characteristic expressions of systems in which human judgement, organisational structure and adaptive dynamics intersect. To engage with them responsibly is therefore not to seek their elimination, but to develop practices of stewardship that enable societies and institutions to act, learn and remain legitimate in the presence of enduring uncertainty.

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