Cartographic Power: Reality–Protocol Theory and the Politics of the Maps We Live Inside

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Abstract

This paper advances *Reality–Protocol Theory* (RPT): the claim that power in complex societies is exercised primarily by designing, distributing, and defending *protocols*—lossy, rule-bearing maps that structure what agents perceive and how they act. A protocol is formalized as a tuple of categories, metrics, rules, versioning policy, and governance. Agents adopt protocols not because they perfectly mirror the world, but because the protocol trades off legibility and coordination benefits against distortion, translation, and embodiment costs. Diffusion is modeled via replicator dynamics, while a simple linear model captures Goodhart drift and immune correction. The theory explains genesis (crises, recombination, liminal spaces), the stability paradox (how successful protocols preserve a stable core while enabling adaptation at the edge), and durability (error-correction, boundary policing, and self-repair as an "immune system"). We propose operational indicators—legibility, distortion, network lock-in, translation cost, embodiment cost, opacity, immune repertoire, and bridging centrality—and outline empirical strategies (event studies, synthetic control, text-as-data, and platform A/Bs) for testing RPT's core propositions, including the thin-protocol diffusion advantage and the legibility–resistance curve. Case sketches on TCP/IP versus OSI and state-building in Afghanistan illustrate the framework. Applications to AI alignment, cryptocurrency governance, platform policy, culture wars, and climate accounting demonstrate reach. RPT reframes politics, markets, and war as protocol contests and relocates power to the design of the maps we are compelled to inhabit.

Keywords: protocols; standards; legibility; Goodhart's law; governance; diffusion; platform power; measurement; ideology; alignment

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1 Introduction

The map is not the territory, yet humans live by maps. Perception and action are mediated by abstractions that compress a world too complex to grasp in its fullness. Those abstractions are not neutral: they foreground certain distinctions, hide others, and prescribe rules. Laws turn citizens into legal subjects, accounting turns activity into numbers, platforms turn behavior into events and tokens. The result is that coordination depends on *shared* maps—and the politics of modern life is in large part a struggle to install one map rather than another as the default environment for others.

This paper formalizes that intuition as *Reality–Protocol Theory* (RPT). By *protocol* we mean a socially enforced map that carries operational rules: a compositional object combining categories, measurements, incentives, update procedures, and governance. Protocols can be legal codes, standards and APIs, platform policy stacks, monetary regimes, ideological frames, or scientific paradigms. Agents seldom accept a protocol because it is true in any absolute sense; they adopt it because it works—it makes the world legible enough to coordinate with others and to be recognized by institutions with coercive or infrastructural capacity. In doing so, they incur distortion (mismatch harm), translation costs (interoperability frictions with other maps), and embodiment costs (retraining, infrastructure, habit).

Two claims follow. First, power is largely cartographic: to rule is to set the *loss function* others must optimize, by defining what counts, how it is counted, and what is rewarded or sanctioned. Second, conflicts are often *protocol wars*: contests between incommensurate maps vying for default status—from standards battles in technology, to metric regimes in corporations, to ideologies that naturalize particular categories of person and harm. RPT offers a vocabulary for these contests and a quantitative scaffolding for measurement.

Our contributions are threefold. Conceptually, we define protocols as rule-bearing maps and articulate the mechanisms by which they originate, stabilize, mutate, and spread. Formally, we provide a compact model of adoption payoffs and diffusion dynamics, plus a drift–correction equation that tracks map–territory divergence under optimization pressure. Empirically, we propose a measurement kit and research designs to test core propositions, and we illustrate the framework with two contrasting cases: the global diffusion of the thin, modular TCP/IP stack, and the high-distortion imposition of thick, externally designed administrative protocols in Afghanistan.

RPT is synthetic. It bridges traditions: bounded rationality and predictive processing in cognitive science; the political sociology of "legibility" and state simplifications; the economics of standards, network industries, and switching costs; the social studies of classification and infrastructure; organizational studies of metrics and audit culture; and the political theory

of constitutionalism and meta-rules. The unifying move is to treat categories, measures, incentives, update cadences, and governance as parts of the *same* compositional object and to analyze power as control over that object's design.

The rest of the paper proceeds as follows. Section 2 situates RPT against related work. Section 3 presents the theory: definitions, mechanisms of genesis, stability, meta-protocols, embodiment, immune systems, ecology, naturalization, and internal conflict. Section 4 formalizes adoption payoffs and dynamics and derives three lemmas. Section 5 operationalizes constructs and describes empirical strategies. Section 6 offers two case sketches. Section 7 discusses applications; Section 8 offers design implications. Section 10 concludes with scope conditions and research directions.

2 Conceptual foundations

Humans compress reality to act. Bounded rationality and predictive-brain accounts portray perception as model-driven; attention and memory are scarce, so representations must be selective. Social coordination then requires *shared* compressions: calendars and clocks, accounting categories, legal statuses, and the innumerable classification systems that make complex societies tractable (Bowker & Star, 1999; Porter, 1995). But these compressions are *normative* as well as descriptive; as Scott (1998) emphasizes, projects of state legibility enable control and extractive capacity while erasing local knowledge. The trade-off between central legibility and local fit recurs across domains.

Technology studies add a complementary lens. Standards and protocols create network externalities and lock-in; thin, interoperable layers travel well, while thick, prescriptive specifications struggle absent coercion or overwhelming complement advantages. The history of the internet's rise from a thin end-to-end architecture is exemplary (Abbate, 1999). Organizational sociology warns that metrics become targets: as incentives couple tightly to measures, optimizing against the metric degrades the underlying reality—Goodhart's Law (Goodhart, 1975). Audit cultures drift toward what can be measured; categories harden and blind spots expand (Strathern, 2000; Porter, 1995).

Political theory and constitutional design foreground *meta-rules*: procedures for creating, updating, and adjudicating rules. Polycentric governance emphasizes overlapping jurisdictions and adaptive, problem-fitting arrangements (Ostrom, 2010). The philosophy of science maps how paradigms define admissible questions, methods, and evidence, and how they shift (Kuhn, 1962). Actor–network theory and infrastructure studies insist that material and technical artifacts carry politics (Latour, 2005; Star & Ruhleder, 1996). RPT synthesizes these insights under one rubric: protocols are rule-bearing maps embodied in people, paper, and machines;

their politics is the politics of map design, installation, and maintenance.

3 Reality–Protocol Theory

3.1 Definitions

A *protocol* is a socially enforced map that carries *rules of use*. Formally, define

$$P = \langle C, M, R, V, G \rangle, \tag{1}$$

where C is a category schema (the ontology of the map), M is a set of measurements/metrics (what is counted and how), R comprises rules, incentives, and defaults, V is a versioning/compatibility policy, and G is governance—a meta-protocol specifying who may change what, with which evidence, and at what thresholds.

3.2 Genesis: where protocols come from

RPT highlights three routes. First, *crisis shocks* that degrade the payoff to incumbents open space for alternatives; failure creates demand for new compressions. Second, *recombination and forking*: new protocols often hybridize existing components or strip layers to expose thin, more general cores. Third, *liminal spaces*—frontiers, black markets, subcultures, warzones, research labs—lower enforcement costs for experimentation and incubate variants that later diffuse.

3.3 The stability paradox

Successful protocols solve a stability–adaptivity tension. Coordination requires a stable shared map; responsiveness requires timely updates. Institutions resolve this by (i) *versioning* (semantic versioning, deprecation schedules), (ii) separating *constitutional moments* from ordinary operation, and (iii) *core/periphery splits* that keep a thin core stable while allowing rapid innovation at the edge. Rate-limiting changes avoids churn-driven embodiment costs and Goodhart spirals from metric volatility.

3.4 Meta-protocols

Protocols that endure specify rules for changing rules: membership and voice (who proposes/ratifies), evidence rules (what proofs count), thresholds (quorum, supermajorities),

and audit/sunset provisions. Explicit meta-protocols accelerate recovery after failures and harden against capture.

3.5 Embodiment and installed base

Maps live in bodies and things: muscle memory, pedagogy, credentialing pipelines; buildings, roads, device fleets; schemas embedded in databases and chips. Embodiment creates inertia and favors incremental layering over wholesale replacement. Transition costs scale with the depth and specificity of embodiment.

3.6 Immune systems

Mature protocols develop error-correction (courts, audits, replication norms), boundary policing (heresy/misinformation labels, trademark defense), self-repair (incident reviews, rollbacks), and diversity safeguards (red teams, metric rotation). Richer immune repertoires slow Goodhart drift and reduce cycle amplitude.

3.7 Protocol ecology

Most domains host multiple coexisting protocols. Ecological relations include mutualism (e.g., accounting standards and capital markets), predation (gatekeeping, rent extraction), and niche differentiation (vernacular local protocols under the radar of centralized legibility).

3.8 Naturalization

The most powerful protocols disappear into the background: default UX, curricular imprinting, architecture that nudges behavior, and category capture render a protocol "just how things are." We operationalize this as *opacity*: compliance without enforcement multiplied by rarity of explicit protocol naming in public corpora.

3.9 Scale and internal conflict

Protocols exhibit phase transitions as scale increases: coarse-graining from micro rules to meso routines to macro regimes. Individuals run multiple, sometimes contradictory, role-protocols; conflicts resolve via priority rules (context salience, sanction asymmetry, identity stakes). High cross-context switching costs correlate with error, stress, and demand for integrative meta-protocols (codes of ethics, personal operating systems).

4 A compact formal model

Let agent i inhabit environment E_i and face a choice among protocols $P \in \mathcal{P}$. Define the following constructs.

Distortion $D(E_i, P)$ Harm from mismatch between environment E_i and compression induced by P (prediction error, welfare slippage).

Legibility $L(P)$ Administrative readability (coverage of registration/ID, data completeness, audit latency, enforcement yield).

Network lock-in $N(P)$ Complement availability, installed base, switching costs, and credential sunk costs.

Translation cost $T(P, \bar{Q}_i)$ Frictions to interoperate with the set of other protocols $\bar{Q}_i$ used by counterparties.

Embodiment cost $K(P)$ Installed base inertia: infrastructure, retraining, habit retooling.

The expected adoption payoff is

$$\pi_i(P) = \alpha L(P) + \beta N(P) - \gamma D(E_i, P) - \delta T(P, \bar{Q}_i) - \epsilon K(P), \quad \alpha, \beta, \gamma, \delta, \epsilon > 0. \tag{2}$$

Let x_P be the population share using P. Diffusion follows a replicator dynamic

$$\dot{x}_P = x_P \left[\bar{\pi}(P) - \sum_{Q \in \mathcal{P}} x_Q \, \bar{\pi}(Q) \right], \quad \bar{\pi}(P) = \mathbb{E}_i[\pi_i(P)]. \tag{3}$$

Goodhart drift and immune correction. Let λ be the intensity of optimization pressure on metrics M and ℓ be measurement leakage (how much optimizing M deviates from the intended target). Let κ be immune correction rate and ρ its effectiveness. Map–territory divergence Δ evolves as

$$\dot{\Delta} = \lambda \ell - \rho \, \kappa. \tag{4}$$

When $\rho\kappa > \lambda\ell$, drift is bounded.

Genesis rate and stability paradox. New-protocol introduction rate η scales with shock intensity s and liminality μ: $\eta = \varphi\, s\mu$ for some $\varphi > 0$. Optimal update cadence u solves

$$\min_{u}\ \Gamma\, D(E, P \mid u) + \Xi\, K(P \mid u), \tag{5}$$

which balances distortion from stasis against embodiment costs from churn.

4.1 Three lemmas

Lemma 1 (Thin-protocol diffusion advantage) *Suppose two protocols P_t (thin, modular) and P_k (thick, prescriptive) satisfy $L(P_t) \geq L(P_k)$, $K(P_t) \ll K(P_k)$, $T(P_t, \cdot) \ll T(P_k, \cdot)$, and $\mathbb{E}[D(E, P_t)] \leq \mathbb{E}[D(E, P_k)]$ across heterogeneous environments. Then there exists $\varepsilon > 0$ such that $\bar{\pi}(P_t) \geq \bar{\pi}(P_k) + \varepsilon$, and under the replicator dynamic $x_{P_t} \to 1$ absent exogenous coercion for P_k.*

Sketch. The uniform payoff gap implies positive selection. Modularity and interoperability reduce embodiment and translation penalties across environments while preserving legibility; heterogeneity magnifies the advantage as thick prescriptions misfit more contexts.

Lemma 2 (Opacity–compliance relation) *Let $O(P)$ denote protocol opacity, defined as the product of sanction-free compliance and rarity of explicit protocol naming. Under bounded attention with switching cost $s > 0$, expected voluntary compliance c is increasing in O: $\partial c / \partial O > 0$.*

Sketch. With status-quo bias in a logit/quantal response framework, unmarked defaults reduce perceived benefit of switching relative to s, raising baseline compliance.

Lemma 3 (Immune-rate threshold) *If $\dot{\Delta} = \lambda\ell - \rho\kappa$, then (i) if $\rho\kappa < \lambda\ell$, Δ diverges (Goodhart spiral); (ii) if $\rho\kappa > \lambda\ell$, Δ is mean-reverting to a bounded set; (iii) periodic audits that temporarily increase κ above the threshold restore alignment after shocks.*

Sketch. Sign of the linear drift term determines global behavior; adding shocks yields an Ornstein–Uhlenbeck process in the aligned regime.

5 Measurement and empirical strategy

We operationalize RPT with a scorecard of indices, each scaled to $[0, 100]$ using z-scores mapped to percentiles. These indices can be used in event studies, difference-in-differences with staggered adoption, synthetic control, and text-as-data designs.

Legibility L (higher is better). Coverage of registration/ID; data completeness; audit latency (reversed); enforcement yield. Define $L = 100 \cdot \Phi(\text{z}[\text{coverage}, -\text{latency}, \text{yield}, \text{completeness}])$ where Φ is the standard normal CDF.

Distortion D (lower is better). Forecast error; outcome–target slippage; incidence of unintended consequences; variance inflation after metric changes.

Network lock-in N (higher is better). Complement count; interoperability breadth; sunk education/credential time; vendor concentration (reversed).

Translation cost T (lower is better). Time/money to convert artifacts; legal steps to recognition; retraining hours; crosswalk complexity.

Embodiment cost K (lower is better). Specificity of capital stock; code/hardware tied to the protocol; installed base age; retraining burden.

Opacity O. Sanction-free compliance multiplied by rarity of explicit naming in media/curricula corpora (with curricular plurality reversed).

Immune repertoire I (higher is better). Presence/strength of error-correction (courts, audits), boundary policing, self-repair (post-mortems, rollbacks), and diversity safeguards (red teaming, metric rotation).

Bridging centrality B_c (higher = more chokepoint power). Construct a bipartite network of protocols and translator nodes; compute weighted betweenness for translator nodes and normalize.

5.1 Research designs

1. **Event studies of protocol updates.** Measure changes in D, L, O, and outcomes around version releases or policy shifts using unit and time fixed effects; use modern estimators for staggered adoption.

2. **Synthetic control for mandates.** For jurisdictions or firms forced to adopt a protocol, construct synthetic comparators to estimate counterfactual trajectories of D and L.

3. **Text-as-data for naturalization.** Estimate explicit naming rates and frame dominance in news, policy, and curricular corpora; track category drift over time.

4. **Platform A/Bs on defaults.** Randomize defaults and metric visibility where ethical/feasible; measure compliance, drift proxies, and welfare outcomes.

5. **Instruments for liminality.** Use exogenous enforcement shocks (e.g., budget freezes, disasters) as instruments for liminality μ to estimate effects on genesis rate η.

6 Case sketches

6.1 Thin-protocol success: TCP/IP versus OSI

The diffusion of TCP/IP over OSI exemplifies thin-protocol advantage. TCP/IP offered a stable, minimal core with end-to-end semantics and pushed complexity to the edge. Its RFC process was an explicit meta-protocol with open membership, evidence norms (running code, interop tests), and incremental versioning. Translation costs were low: gateways bridged heterogeneous local networks; embodiment costs were manageable due to commodity hardware and incremental deployability. Complements exploded as the web took off, creating network lock-in. Opacity rose as the "internet way" became unmarked common sense in industry and curricula. Immune repertoire matured through best current practices (BCPs), peering norms, and incident post-mortems. OSI, by contrast, was thicker and more prescriptive; absent commensurate coercion or complement advantages, it struggled to fit heterogeneous environments.

6.2 Thick-protocol failure: State-building in Afghanistan

Externally designed administrative, legal, and security stacks raised legibility for donors and central ministries but imposed high distortion on diverse local ecologies. Embodiment conflicts with customary justice and decentralized authority structures generated resistance; translation costs were borne by a class of intermediaries (contractors, NGOs) whose bridging centrality enabled rents and ceremonial compliance. Immune mechanisms (audits, courts) were weak or politicized; Goodhart drift manifested in KPI gaming (districts "cleared," schools "built"). Opacity remained low; the protocol was experienced as visible imposition rather than naturalized order. As coercive and fiscal support waned, reversion toward locally legible protocols followed.

7 Applications

AI alignment. Alignment can be reframed as installing a *control protocol* for powerful optimizers: defining categories, metrics, and constraints, plus meta-protocols for safe updating and immune mechanisms for spec-gaming detection. Thin cores with modular oversight and strong translation layers (human–model–institution) are predicted to diffuse better.

Cryptocurrency and monetary stacks. Cryptonetworks are explicit attempts to found new monetary protocols with alternative trust assumptions. Bridges and exchanges possess high bridging centrality and therefore political power. Governance tokens and improvement proposals are meta-protocols; chain splits are forks when the stability paradox fails.

Platform governance. App stores and content policies are infrastructural protocols with quasi-governmental reach. Defaults, review rules, and measurement dashboards define loss functions for developers and users; A/B infrastructure enables rapid ordinary updates, while high-ceremony policy overhauls play the constitutional role.

Culture wars. Conflicts over gender, identity, and merit can be analyzed as clashes between category schemas C and metric regimes M. Naturalization battles are struggles over opacity: which map becomes "just how things are."

Climate accounting. GDP-centric metric regimes clash with sustainability taxonomies and carbon accounting. Immune systems (MRV—measurement, reporting, verification) mitigate drift; polycentric arrangements allow local fit while preserving global coordination.

8 Normative design implications

RPT yields practical guidance. First, practice *protocol humility*: prefer thin cores with local plug-ins; avoid smuggling value judgments into universal layers. Second, build for *polycentricity*: overlapping protocols reduce single-point failure and allow niche fit. Third, make *interoperability* a default; invest in translators and shared schemas. Fourth, govern metrics: separate measurement from reward where feasible, rotate metrics, and audit for drift. Fifth, embed *sunset clauses* and feedback loops; specify meta-protocols before crises, not during them.

9 Discussion and limitations

RPT is a lens, not a monocausal theory. Material resources, coercion, geography, and contingency matter, and some phenomena are better explained by them. The claim is that protocol power is *systematically under-theorized* and that treating categories, measures, incentives, versioning, and governance as a unified object clarifies otherwise disparate puzzles. Scope conditions likely include complexity (the approach is most useful where coordination depends on abstraction) and modularity (where thin cores are feasible). A fuller model could endogenize the weights $\alpha, \ldots, \epsilon$ and allow for strategic investment in L, N, T, K, and I by designers and rivals. Microfoundations of within-person polyprotocol conflict and identity dynamics merit further work, as do richer ecological models of coexistence and parasitism among protocols.

10 Conclusion

Power often looks like map design. Reality–Protocol Theory makes that intuition precise by treating protocols as compositional, rule-bearing maps and by analyzing their genesis, stability, evolution, and diffusion. Where the classic slogan warns that the map is not the territory, RPT adds: in modern life, the *map we are made to use* is a central battleground. By measuring legibility, distortion, lock-in, translation, embodiment, opacity, immune repertoire, and bridging centrality, and by studying protocol changes with contemporary causal tools, we can move the analysis of protocols from metaphor to method. The payoffs are conceptual unity across domains and practical guidance for building maps that coordinate without crushing, adapt without unraveling, and remain visible enough to be governed.

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