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Why platform-mediated communication tends to become imbalanced: a two-wing, three-layer mechanism framework of communicative structure

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Abstract. Datafied platforms increasingly reconfigure communicative conditions through interface design, infrastructural control, and algorithmic modeling. This article argues that platform-mediated communication tends toward a structural imbalance between a material-institutional wing and a symbolic-rational wing. We develop a two-wing, three-layer mechanism framework (interface/infrastructure/model) mapped across entry, reach, and evaluation to show how communicative practices are captured, visibility is allocated, and outcomes are sedimented into reusable thresholds. Anchored generatively in Marx and normatively in Habermas, the framework specifies scope conditions and minimal institutional levers for rebalancing and enables comparative, empirically oriented critique.

Keywords: platformization, communicative structure, data private property regime, extraction–prediction logic, algorithmic governance

1. Introduction

Datafied platforms, especially social media and search engines, now organize a large share of everyday interaction. Recent work describes this shift as the platformization of the public sphere and debates its structural consequences [1, 2]. The authors argue that platform-mediated communication exhibits a persistent imbalance between the two wings: material-institutional mechanisms increasingly pre-shape the conditions under which symbolic-rational mechanisms can operate.

Research on platformization is extensive but fragmented. Political economy, media and information ecology, and governmentality/subjectivity studies each identify strong tendencies such as "surveillance", "colonization", "platformization" and "algorithmic governance". What remains rare is an integrated mechanism account that shows how these tendencies combine and recur across platforms and contexts.

This gap leads us to one core question. Why does communication under platform conditions tend toward persistent structural imbalance? In practice, the imbalance appears across three moments: entry, reach, and evaluation. Communication keeps moving toward an extraction-prediction logic, instead of coordination that is centered on understanding. The authors identify three minimum conditions of communicative practice.

Reasons can be opened to challenge, mutual recognition can be sustained over time, and justification can be made public. When data and models function as central productive forces and a Data Private Property Regime (DPPR) becomes entrenched in dominant platforms, how are entry, reach, and evaluation systematically rewritten in ways that defer symbolic-rational practices and render them instrument-like?[1] Our aim is to explain the mechanisms that produce this imbalance, not merely to list its symptoms.

The authors respond to this gap with a tractable mechanism framework, which is also our core contribution. This intervention is a theoretical claim about where mechanisms operate and how imbalance is reproduced. The grid is a way of making the theory's claims precise enough to specify observable implications and structure comparative inquiry, not a new method in itself. The authors use communicative structure as a mediating concept. It has two wings. One wing is material-institutional mechanisms. It includes platform infrastructure, interface rules, and algorithmic models.The other wing is symbolic-rational mechanisms. The authors focus on three dimensions in this wing. They are reason-giving, mutual recognition, and public justification. The authors present this framework through a three-layer apparatus grid to track how each layer compresses different practices. The three layers are interface, infrastructure, and model. They primarily shape the moments of entry, reach, and evaluation in communication.

The framework contributes three mechanism moves. It decomposes "the technical" into apparatus positions (interface, infrastructure, model), tracks when communication is rewritten (entry, reach, evaluation), and specifies what is normatively compressed (reason, recognition, justification). Together, the grid yields examinable middle-range claims about how DPPR-linked apparatus control shifts the relative weight of the two wings across settings.

Our key claim is that the three layers exert differentiated effects on the three practices. When DPPR becomes entrenched and couples with an extraction-prediction logic, an imbalance between the two wings is best understood as a structural tendency, not an occasional governance failure.

Marx and Habermas supply two constraints on this framework rather than background citations. Marx provides the anchor for historical genesis. When DPPR becomes entrenched, communicative forms couple with productive forces and relations of production, stabilizing an extraction–prediction orientation. Habermas provides the anchor for normative judgment. This anchor prevents "imbalance" from becoming a merely descriptive label. On our account, imbalance refers to a patterned displacement and functionalization of the conditions of reason, recognition, and justification, undermining the symbolic-structural reproduction of the lifeworld. Together, they keep the framework both explanatory and normatively located.

The article proceeds as follows. Section 2 synthesizes three research routes and specifies the gap. Sections 3–4 develop the theoretical bridge and localize mechanisms across interface, infrastructure, and model along entry, reach, and evaluation. Section 5 derives minimal rebalancing levers implied by the diagnosis. Section 6 concludes with contributions, scope conditions, and a research agenda.

[1] Data Private Property Regime (DPPR), as used here, refers to a platform-centered regime of control. First, it entails exclusionary control over access to data and their secondary uses, as well as over derivedmodels, exercised through technical and contractual means. Second, it involves the unilateralappropriation of value from behavioral traces. Third, it rests on infrastructural dependency and lockin, such that participation becomes contingent on platform-governed interfaces, standards, and terms. DPPR is thus an analytic label for this bundled configuration of exclusion, appropriation, anddependency, rather than a claim about formal legal "ownership" of data in any simple sense. Analytically, the authors treat DPPR as "strong" when these three elements are jointly present and mutuallyreinforcing; where one element is absent, the authors speak of partial DPPR and expect weaker or interruptedreproduction of the mechanism chain

2. Literature review

Prior research richly documents extraction, visibility allocation, and predictive evaluation, but it still lacks a unified mechanism framework that localizes where these mechanisms operate and explains how their combination becomes stably reproduced. The authors therefore reread three recurring lines of argument through mechanism localization across three apparatus layers—interface, infrastructure, and model—and examine how each layer intensifies the compression of reason, recognition, and justification across entry, reach, and evaluation.

2.1. Political economy: Assetization and the extraction-prediction logic

Political economy research shows how assetization reorganizes communication as an extractable and accountable input–output relation. When data and models become central assets for value capture, communicative activity is institutionalized as a pipeline of inputs that can be extracted and outputs that can be accounted for.

Assetization is produced through institutional practices rather than a simple transfer of ownership. Data becomes an asset through measurement, governance, and valuation [3], which stabilizes measurability and tradability. This institutionalization strengthens platform power by concentrating how information is valued in markets and regulatory settings [4] and by supporting durable rent streams across sectors [5]. Studies of gig platforms make this dynamic visible. Labor governance and monitoring both intensify exploitation and generate reusable data assets within workflows and rating systems [6], drawing labor and communication into the assetization chain.

This literature highlights three linked shifts. First, experience is treated as low-cost raw material: behavioral data is separated from service improvement, recast as "behavioral surplus", processed through machine intelligence, and converted into prediction products sold in behavioral futures markets [7]. Second, accumulation becomes circular. Data scale improves models, improved models attract users, and network effects raise switching costs, locking communicative resources into a small number of dominant platform architectures [8]. Third, assetization is stabilized through contracts and regulatory environments. Control over data and access can resemble property rights and secure durable rent streams [9].

Political economy identifies the profitability and accumulation logic, but it under-specifies where, in the communicative process, the imbalance is produced and reproduced. To locate the apparatus positions that rewrite entry and reach, the authors turn to media and information ecology.

2.2. Media and information ecology: The spatial re-encoding of public visibility

Media and information ecology shows that public visibility is not an effect that simply follows communication; it is an infrastructural condition that platforms configure and govern. Platforms therefore function as apparatuses that allocate visibility resources rather than neutral conduits. This configurational power extends beyond on-screen interfaces: through partner ecosystems and commercial/data partnerships, it expands into B2B infrastructural networks that enable platform expansion while reshaping governance and power relations [10].

The rewriting of public visibility unfolds as a chain across layers. At the interface layer, platforms eventize interaction by standardizing activity into measurable signals and translating visibility into metrics [11]. At the infrastructure layer, the open web is increasingly mediated by platform APIs and terms of service. Access rights, rate limits, and entry conditions delimit data flows and generate lock-in, shifting interoperability from open protocols toward a more closed structure in which a few platforms control entry points and routin [12].

At the level of knowledge production, power moves upstream as social knowledge is increasingly generated through platforms' processing and reuse of data, a structural appropriation highlighted by the "data colonialism" thesis [13]. Analytically, this implies that visibility should be treated as an empirical object assembled through institutions and practices, rather than reduced to abstract media effects [14].

Platform governance operates not only through removal decisions but also through the calibration of reach and distribution. Studies of TikTok describe this as "visibility moderation", in which governance works by managing how far content travels and how visible it becomes [15]. This configurational control hardens into a structural condition when coupled with cloud and AI industrialization. Dependence can harden into a structural condition, as a small number of cloud firms control critical layers of the industrial AI stack and extend entry-point and routing advantages into wider sectors [16].

This shifts the analytic focus from the reorganization of communicative space to the reorganization of judgment. Once evaluation is keyed to performance indicators rather than public scrutiny in reason-giving terms, governmentality and subjectivity research becomes the next required lens.

2.3. Governmentality and subjectivity: The turn to metricization

Governmentality and subjectivity studies explain how algorithmic governance operates through recording, modeling, and feedback loops that reshape choice architectures and self-understanding. In this setting, symbolic-rational dimensions are often translated into performance metrics rather than treated as independent constraints.

The turn to metricization can be read as a sequence. First, personalized choice architectures preconfigure action paths in fine-grained and less noticeable ways, guiding decisions while making effective questioning difficult [17]. Second, visibility and rating mechanisms mobilize actors as self-monitoring subjects, turning opportunity, performance, and exposure into competitive resources that sustain self-optimization [18]. Finally, in machine-learning practice, differences are compressed into features and indicators, and "being understood" is increasingly rewritten as "being predictable", making communication more likely to be absorbed as performance signals rather than structures of reasons [19].

As steering is translated into optimizable metric chains, institutional responses increasingly center on auditability and accountability. Audits assess how algorithmic systems affect rights and interests, while accountability demands a checkable chain linking organizational procedures, responsibility allocation, and external oversight. The aim is to prevent "technical compliance" from substituting for public reasons [20, 21].

These three routes illuminate different dimensions of the same reconfiguration, yet they remain insufficiently coordinated. Political economy foregrounds generative motives, media and information ecology locates apparatus positions, and governmentality and subjectivity clarifies lived and internalized effects. The next step is to integrate them in one coordinate system and ask whether they converge on an empirically examinable structural tendency. This is the point at which our research gap becomes clear.

2.4. Synthesis: A two-wing imbalance in communicative structure and the research gap

Read together, these studies converge on symptoms of an imbalance between the two wings in communicative structure. Platforms do not simply "break" communication. They reorganize entry, reach, and evaluation through apparatuses and institutional arrangements. This tends to stabilize an advantage for material-institutional mechanisms, while reason, recognition, and justification are displaced and functionalized. The remaining gap is analytical: the authors lack a framework that both explains how this advantage is reproduced and specifies where compression occurs in the communicative process.

The literature therefore points to a structural tendency under DPPR and large-scale datafication. Entry is preformatted as capturable signals, distribution is translated into visibility metrics, and outputs are reduced to prediction targets. The practical shift is from understanding to response, from recognition to exposure, and from public justification to technical effects. Because these shifts cut across moments, they are better treated as a structural deformation continuously reproduced in everyday cognition, interpersonal relations, and public discussion.

The gap can therefore be stated in operational terms. Existing work starts from labels. These include surveillance capitalism, data colonialism, platformization, and algorithmic governance. These labels help identify key mechanisms. They highlight extraction, visibility allocation, and predictive forms of governance. However, they do not locate these mechanisms within a single grid of entry, reach, and evaluation or specify how each moment differentially compresses reason, recognition, and justification. What is needed is a middle-range mechanism theory that explains how this advantage is reproduced and specifies where compression occurs across entry, reach, and evaluation. The next subsection lays out the framework's coordinates and prepares the theoretical bridge in Section 3.

2.5. Analytical coordinates: Building and applying the framework

To specify the mechanism theory in a transparent way, the authors use four linked coordinates. The two wings (material-institutional and symbolic-rational mechanisms) serve as structural coordinates. The three apparatus layers (interface, infrastructure, model) serve as positional coordinates for locating where mechanisms operate. The three moments (entry, reach, evaluation) mark where communication is rewritten in process terms. The three practices (reason, recognition, and justification) specify the practical dimensions of the symbolic-rational wing. Using this grid, the authors identify where mechanisms are located and where compression occurs.

Section 3 explains why the framework requires two anchors: a generative logic and normative coordinates. With these in place, the authors connect the claim about forms of intercourse and the mode of production to the claim about lifeworld reproduction, enabling a continuous dialogue between the two.

3. Theoretical bridge: Communicative structure as a two-wing mediating framework

3.1. The mediating framework

This section introduces communicative structure as a mediating framework that links a generative anchor (Marx) and a normative anchor (Habermas). The authors use this linkage to explain why platform-mediated communication exhibits structural imbalance rather than contingent distortions. The bridge specifies how a generative account of structural reproduction constrains the feasible space of communicative rationality at concrete apparatus positions.

The authors operationalize communicative structure through three apparatus layers: interface, infrastructure, and model. The authors treat them as positions where mechanisms operate. These layers correspond to three process moments: entry, reach, and evaluation. On the symbolic-rational side, the authors focus on reason, recognition, and justification as the core practices at stake in lifeworld reproduction. The framework specifies a coordinate grid that links how each apparatus layer rewrites conditions across entry, reach, and evaluation to how these rewritings differentially compress reason, recognition, and justification.

The point of this mediating framework is to turn "where mechanisms operate" and "where compression occurs" into examinable middle-range claims, rather than leaving them as descriptive labels. It identifies the

technical and institutional conditions under which the relative weight of the two wings shifts, and it makes "where compression occurs" an empirical question. Section 4 builds on this coordinate grid to diagnose mechanisms across the three layers. Section 5 uses the same structure to specify minimal governance levers for reopening room for communicative rationality at the apparatus level.

Common schemes lack this resolution. Many interaction-focused accounts treat "the technical layer" as a single unit, which blurs the distinction between interface design and infrastructural architecture even though they play different roles in communicative structure. The system–lifeworld binary often treats the platform simply as "the system", but it cannot locate where reason, recognition, and justification are compressed within the apparatus. Broad divisions into content, technology, and institutions face the same limitation. They do not yield indicators tied to concrete apparatus positions and practices. By contrast, our framework supplies analytical coordinates that support comparison and contestation across technical positions.

Instead of asking which macro-label best fits a platform, the authors ask which apparatus position rewrites which process moment in ways that compress which practice, and under what property and dependency conditions. This shift turns debates about "platform power" into mechanism questions that can be compared, contested, and traced across cases.

The authors next specify the framework's two anchors in turn: Marx provides the generative account of structural reproduction, and Habermas provides the normative coordinates for diagnosing imbalance.

3.2. Generative anchor: Forms of intercourse and the mode of production

This subsection specifies the generative anchor of our framework. Marx's proposition that forms of intercourse co-evolve with the mode of production helps explain why the diagnosed imbalance can be stably reproduced rather than episodic.

The authors reread datafied platforms through this proposition. Platform apparatuses are not merely technical containers for interaction. They are materialized and institutionalized structures that give contemporary intercourse a durable form. This grounding matters because it locates an imbalance between the two wings at the level of the mode of production.

In The German Ideology, Marx and Engels use "forms of intercourse" to establish a historical-materialist standpoint in which intercourse is a constitutive dimension of social being and social reproduction rather than a mental layer external to production. Marx argues that forms of intercourse are shaped by existing productive forces and also shape them in return, a point he formulates through the category of civil society [22]. Analytically, forms of intercourse are constrained by a given configuration of productive forces, yet they also condition how those forces are socially organized and reproduced.

From this standpoint, datafied platforms are not merely a novel firm type. They constitute a productive-force configuration organized around data capture, storage, computation, and distribution. Under this configuration, DPPR functions as a corresponding relation of production. It is not only an ex post legal constraint. It enters upstream by structuring the conditions under which communication can occur through property arrangements and infrastructural dependencies.

When data and data-driven models become central to valorization, communicative activity is reorganized accordingly, and the relative weight of the two wings shifts in a structurally asymmetric direction. Material-institutional mechanisms gain an upstream advantage through DPPR, infrastructural control, and algorithmic governance. Symbolic-rational mechanisms are not eliminated, but practices of reason, recognition, and justification are more likely to be displaced and instrumentalized. They often appear as secondary constraints or post hoc layers rather than as organizing conditions of communication.

The authors treat this shift as historically produced. It reflects the sustained coupling between datafication and platformization as productive forces and an accumulation logic often discussed as data colonialism [13]. The co-evolution proposition is therefore analytically useful because it lets us treat interface, infrastructure, and model as materialized forms of contemporary intercourse, not neutral layers. Their coupling with capitalist imperatives systematically reshapes the conditions under which symbolic-rational mechanisms operate. This provides the generative grounding for the diagnosis that follows.

3.3. Normative anchor: Lifeworld reproduction and validity claims

This subsection specifies the framework's normative anchor through Habermas's account of lifeworld reproduction, so that "imbalance" functions as a criterial diagnosis rather than a descriptive label for change.

With lifeworld reproduction as the reference point, the authors treat reason, recognition, and justification as the core practices through which the symbolic-rational wing matters. This directs attention to how platform apparatuses reconfigure, from within, the conditions under which these practices can be performed.

In *The Theory of Communicative Action*, Habermas ties social integration to the reproduction of the lifeworld's symbolic structures. Lifeworld reproduction involves three linked tasks: renewing valid knowledge, sustaining group solidarity, and socializing actors who can be held responsible. These tasks depend on raising and testing criticizable validity claims (Geltungsansprüche) in communicative action [23]. On that basis, Habermas advances the diagnosis of lifeworld colonization.

When leading datafied platforms increasingly provide infrastructures for everyday communication, colonization takes an apparatus-embedded form. System imperatives do not simply intrude from the outside. They are mediated through interface choices, protocol standards, and access rules, and then operationalized through algorithmic models. Platforms can encode allocation, behavioral steering, and risk management into mundane communicative infrastructures [9, 12]. The result is functional coupling between system and lifeworld within the same platform apparatus.

This coupling can be specified across the three apparatus layers, each of which rewrites a different set of communicative conditions. At the interface level, public visibility is decomposed into metrics—ranking weights, recommendation scores, and exposure slots—so mutual seeing is shaped primarily by algorithmic ordering rather than participants' capacity to offer and contest reasons. At the infrastructure level, connectivity is redrawn through API permissions, rate limits, and terms of service, shifting open interoperability toward managed access and turning interoperability into a licensed technical privilege [12]. At the model level, evaluation and steering rely increasingly on predictive indicators rather than publicly articulated normative contestation, so effectiveness can outweigh reason-based deliberation in practice. Yeung's "hypernudge" clarifies one mechanism: recommender systems guide choices through personalized choice architectures, and outputs can be misrecognized as spontaneous choice [17]. In this arrangement, justification is recoded as a technical question of performance. If a recommendation or ranking improves click-through, watch time, or conversion, it tends to receive priority. Whether it can withstand public scrutiny in reason-giving terms becomes secondary.[2]

[2] This process has already been indicated in the earlier discussion of van Dijck, Plantin, and Couldry and Mejias.

From the perspective of communicative structure, these reconfigurations do not eliminate the symbolic-rational wing. They re-embed it within platform apparatuses under tighter constraints. Reason, recognition, and justification no longer operate as relatively autonomous normative dimensions. Instead, they are folded into a techno-institutional logic oriented to visibility allocation and efficiency optimization, where they tend to appear as tunable parameters.

This reframes Habermas's classic system–lifeworld diagnosis for the platform era. The issue is the rewriting of lifeworld reproduction conditions from within the apparatus across interface, infrastructure, and model through the reorganization of entry, reach, and evaluation. This is why communicative structure is analytically necessary here. It links a generative account of structural reproduction with normative coordinates for diagnosing imbalance.

4. Mechanism specification across the three layers: Entry, reach, and evaluation

This section advances the paper's core diagnosis. Interface, infrastructure, and model systematically reconfigure entry, reach, and evaluation in ways that differentially compress reason, recognition, and justification. The authors disaggregate the platform apparatus into three layers and track how each layer reshapes communicative conditions across the three moments. For comparability, the authors keep the same coordinates throughout.

4.1. Interface layer: Capturable entry and visibility programming

At the interface layer, platforms preformat communication at the point of entry by recoding entry as capturable events and expression as visibility programming. This configuration grants the material-institutional wing an upstream advantage, while the symbolic-rational wing operates only within constraints set by interface logic.

First, entry is organized as capturable events that double as data-generation points. Clicks, swipes, dwell time, and navigation are routinely converted into usable by-products, what Kitchin terms exhaust data [24]. On mobile devices, tracking permissions and consent pop-ups turn entry into an institutionalized gate, and presentation details shape what users believe they authorize and what they expect to follow [25]. The interface is therefore not a neutral surface. It connects communicative entry to data provision.

Second, capturability is produced through the alignment of code and contractual terms. Default settings, opt-out routes, and privacy notices often operate as a bundle that raises the practical costs of refusal and withdrawal [9]. Consent-interface studies show that refusal friction and button design can materially affect consent choices [26]. Large-scale analyses of cookie banners likewise suggest that outcomes are driven by interface strategies and defaults more than transparent preference expression [27]. When deactivation or deletion is cumbersome, continued use functions as continued authorization and sustains data provision [28]. The implication for reason is direct. At entry, contestability depends less on whether users can articulate reasons and more on whether interfaces provide comprehensible information and workable paths to refuse and revoke.

Third, interfaces structure visibility as a controllable resource. Buttons, feedback cues, and recommendation gateways translate the chance of being seen into tunable parameters. This is central to Bucher's account of programmed sociality and can be read here as visibility programming, in which visibility is pre-arranged through design and computational ordering [29]. Under these conditions, recognition can be redirected into competition over countable interaction signals such as likes and reposts, while reason is less likely to organize public argument around claims and more likely to appear as downstream demands for

explanations of visibility outcomes. The interface thus recodes entry and expression into a chain of capturable, feedback-ready, and optimizable signals.[3]

When interaction is rendered as events, consent and exit are designed with high friction, and visibility feedback is tied to ranked exposure slots, platforms gain a persistent upstream advantage at entry by securing steady streams of data and early attention. In this configuration, reason is easier to narrow to what the interface permits, the non-competitive basis of recognition is easier to erode as visibility programming becomes normalized, and justification is more likely to appear as ex post explanations of interface rules and visibility allocation rather than as publicly contestable argument about entry design and visibility programming.

4.2. Infrastructure layer: Managed connectivity and platformized reach

At the infrastructure layer, platforms reorganize reach and interoperability through layered controls. Arrangements once coordinated through open protocols are translated into managed access and allocation within platform environments, stabilizing reach conditions and fixing connectivity boundaries in structural ways.

In the open web ideal, connectivity is coordinated through common protocols and public standards. Platform infrastructures disrupt this premise by channeling connectivity through APIs, quotas, identity systems, and contractual terms, thereby recoding connectivity as managed connectivity that can be recalibrated. Plantin and colleagues capture this dual movement: platforms expand by offering infrastructural services while defining interfaces and ecosystem rules that lock access inside platform-set technical boundaries [12]. Methodological work on digital trace data underscores the same point: APIs and access routes are governed by mutable technical and policy constraints, making decisions about who can access which data part of platform governance [31].

Managed connectivity operates through three linked mechanisms. First, permissions and quotas organize access through eligibility rules and call limits, producing a tiered structure. Second, interoperability becomes path-dependent: once core functions are tightly coupled to specific APIs, identity systems, and protocols, switching and exit costs rise. Third, reach becomes a governance variable. Through contractual terms, platforms reserve unilateral rights to modify, suspend, or terminate access, making reach allocation a governed object rather than a neutral technical condition. This is why interoperability is often framed as a goal that requires external obligations to limit unilateral discretion [32].[4]

Network effects entrench platformized reach by generating cumulative loops in which user growth supports data accumulation, data supports model improvement, and improved models reinforce attractiveness [8]. Once key organizational ties move onto a small number of platforms, exit is no longer a simple tool substitution. It can sever relational networks, disrupt information distribution, and break established business processes.

When managed connectivity licenses reach and reserves adjustment powers through contractual terms, the terms of contestation shift. Reason is less able to translate into publicly contestable rules on reach boundaries or viable appeal-based correction mechanisms. Recognition depends on sustained reach, yet reach is rendered a platform-controlled variable. Justification therefore tends to migrate into compliance documentation and internal review rather than public argument over reach rules and boundary-setting.

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[3] Related regulatory discussions summarize such misleading interface designs as dark patterns [30].

[4] The Digital Markets Act similarly treats interoperability and data access as part of a binding institutional regime for designated gatekeepers [33].

4.3. Model layer: Metricization, predictive governance, and the recasting of justification

At the model layer, communicative ends are encoded as optimizable system metrics. Predictive governance then relocates justification from a publicly contestable process to the attainment of system metrics, systematically subordinating the symbolic-rational wing in evaluative practice.

First, metricization redefines what counts as a "good" outcome through the objective function. Click-through rate and dwell time become central because they are measurable and readily integrated into optimization loops. By contrast, many normative values enter as constraints, penalty terms, or compliance checks. Recommender-systems research emphasizes that objectives and metrics are not neutral. They structure system behavior and determine which values appear as internal goals versus external constraints [34]. The decisive question is not measurement accuracy, but which values are permitted to enter the objective function.

Second, predictive governance moves judgment upstream through correlation modeling that translates evaluation into thresholds and scores. Rouvroy's account of algorithmic governmentality captures this shift: governance is organized less through commands or explicit normative reasoning than through modeling digital traces and acting via risk scores and rankings that modulate conduct before action occurs [35]. At the level of experience, predictive governance often takes the form of a continuously updated choice architecture. Yeung terms this the hypernudge, as systems iterate on feedback-ready metrics and selectively amplify behavioral tendencies [17]. Audit work adds a concrete implication. Engagement-based ranking can amplify more partisan and out-group hostile political content, and this amplification does not track stated preferences or satisfaction [36].

Third, metricization and predictive governance reinforce each other through feedback loops. Objective functions shape ranking and distribution; ranking and distribution reshape visibility and steer interaction; interaction returns as training and evaluation signals, thereby stabilizing prevailing objectives and metrics [37]. When this loop aligns with data assetization and markets for prediction products [7, 9, 38], justification is more likely to be reduced to performance management and compliance at the organizational level.

As a result, metricized evaluation at the model layer reshapes communicative structure in three ways. Reason narrows into output explanations, while public contestation over objective selection and value trade-offs is often absent. Recognition is more readily substituted by profiling and scoring, allowing differential treatment without adequate channels for dialogue and correction. Justification is prone to shift into technical routines, including impact assessment, audit, and performance review. The informational basis and timing of these routines depend heavily on internal metrics and log infrastructures.

5. Rebalancing the two wings: Institutional levers across the three layers

This section advances a structural normative claim: rebalancing requires enforceable, apparatus-level constraints mapped onto interface, infrastructure, and model, because the diagnosed imbalance is produced by how these layers rewrite entry, reach, and evaluation over time.

5.1. Material-institutional wing: Rewriting structural conditions

At the material-institutional wing, rebalancing must begin with the structural conditions under which interface, infrastructure, and model are jointly configured. Under current platform architectures, this wing tends to dominate because the three layers are aligned through code and institutional arrangements, shaping entry conditions, reach conditions, and objective formation.

When this configuration serves data extraction and predictive optimization, communicative activity is reorganized within an extraction-prediction logic. Symbolic-rational practices then operate downstream, inside

apparatus-set boundaries, and rarely feed back to constrain the structure as a whole.

The authors therefore derive three minimal enforceable constraints, in direct correspondence with the three apparatus effects diagnosed in Section 4. They are a reconfiguration of data-use rights at the interface layer, interoperability and reach obligations at the infrastructure layer, and auditable compliance at the model layer with respect to objectives and secondary uses.

These constraints target structural conditions in the communicative process and open minimal procedural entry points for reason, recognition, and justification.

Because the interface rewrites entry through capturability and consent frictions, rebalancing must begin with enforceable data-use rights at the point of entry rather than abstract ownership claims. De facto control can arise through legal and technical control over aggregated databases and access routes [39, 40]. Debating whether data is property therefore does little to address lock-in. A more actionable route is the granular design of use rights.

The diagnosis therefore implies a contestable, enforceable use-rights constraint at entry. One concrete instantiation is institutionalized stewardship (e.g., data trusts), which relocates access, reuse, and benefit-sharing from private contracting to a framework open to contestation and scrutiny [38]. The point is to make entry-related data uses contestable and enforceable at the interface, so that capturability and consent frictions no longer operate as default conditions of participation.

Because reach is rewritten as managed connectivity under unilateral terms, the minimum corrective is to convert interoperability from a voluntary promise into a binding obligation. The open web relied on shared protocols to sustain interoperability. Under platform logics, API policies, rate limits, and access permissions translate reach into a managed and adjustable resource [12]. Network effects can further entrench this arrangement [8]. In this structure, who can be heard, and under what conditions mutual visibility holds, is shaped primarily by platform-defined tiers and thresholds rather than by publicly contestable procedures.

Interoperability therefore cannot remain at the level of contractual declarations. Without a boundary constraint that removes unilateral discretion over portability, switching horizons, and interconnection capacity, reach remains a variable controlled by platforms [41, 42]. The minimum constraint is to remove unilateral discretion over reach conditions at the interoperability boundary.

This lever follows from the diagnosis that the model layer rewrites evaluation through objective functions and secondary-use practices that are largely invisible and internally audited. Rebalancing therefore requires verifiable compliance conditions—record-keeping, external review, and purpose-bounded secondary use—rather than paper transparency alone.

Objective setting and secondary data use should be tied to record-keeping and external review, so that purpose limitation, contextual transfer, and long-term retention do not rest on internal self-attestation alone.

Platforms can invoke flexible clauses such as "legitimate interests" or "service improvement" to preserve the appearance of compliance [9], and they may shape regulatory intensity through policy influence [43]. The issue is therefore not the elegance of terms but whether secondary use, contextual transfer, and retention can be independently verified.

Two minimum constraints follow for large or socially consequential platforms. First, high-risk processing should trigger external review and logging duties, allowing key compliance claims about objectives and purpose limitation to be independently verified. Second, disclosure must be made verifiable; otherwise, transparency tools can fail because disclosed data are unusable or poorly structured [44, 45].

In short, the minimum constraint at the evaluation stage is independent verifiability of objective-setting and secondary-use claims, rather than self-attested compliance.

Read as constraints rather than options, each lever is fixed by the diagnosed mechanism at its apparatus site: entry (interface), reach (infrastructure), and evaluation (model).

5.2. Symbolic-rational wing: Re-embedding reason, recognition, and justification

Rebalancing also requires that the symbolic-rational wing recover enforceable positions inside platform architectures. Reason, recognition, and justification cannot remain ex post add-ons; each requires an operational foothold at the relevant apparatus stage and process moment (entry, reach, and evaluation). Building on the material-institutional revisions above, the authors specify institutional footholds for these practices within interface, infrastructure, and model.

In Habermas's account, communicative rationality is stabilized through procedures, rights, and institutional forms and is thereby embedded in lifeworld reproduction [23].

Because entry is the first point at which contestability is displaced, the minimal foothold for reason must be procedural and front-loaded at the interface. Communicative rationality presupposes that coordination rests on claims that can be challenged [23]. In platform environments, however, many decisions, including recommendation and throttling, are mediated by opaque metrics. Users typically observe outcomes without access to the grounds. They cannot easily ask "why me" or "why this content".

A minimal institutional step is to provide basic, actionable explanations at entry and distribution. This includes "why you see this content" and "why this action was taken" [46]. In high-impact automated decisions, such as credit scoring and hiring, platforms should also maintain a workable route for human review and appeal [17]. Otherwise, explanation duties collapse into after-the-fact narratives that do not enable contestation and correction, leaving affected parties without voice and making arbitrariness harder to identify and remedy [47, 48].

When mutual encounter is mediated by platform-controlled reach conditions, recognition can no longer be treated as an emergent social outcome; it requires a foothold in the governance of reach and visibility allocation. Through ranking and recommendation, platforms recode social visibility as adjustable weights [29]. When visibility is determined entirely within that configuration, recognition can slide into competition for exposure and metrics.

Communicative rationality does not require equal exposure. It requires publicly contestable conditions for discussion on public issues. The diagnosis therefore implies a minimal rule-and-review pathway for public-issue visibility, so that allocation can be challenged, reviewed, and, where warranted, corrected without collapsing into discretionary, purely internal calibration.

Because evaluation is organized around performance metrics, the minimal foothold for justification is an ex ante burden of justification that can be externally reviewed. Metricization and predictive governance can make "effectiveness" the dominant standard in practice, while relocating fairness, respect, and public-interest concerns into ex post compliance routines.

In high-impact domains, a more actionable route is ex ante impact assessment combined with external review. These steps are a minimum requirement before deployment and triggered again before updates or retraining that could change risk profiles, specifying implicated rights and risks and, within scope, assessing group-differentiated effects [46].

Overall, re-embedding reason, recognition, and justification across interface, infrastructure, and model is not a blueprint for an ideal speech situation. It is a minimal institutional pathway for communicative rationality within existing architectures. In consequential cases, users should be able to ask "why"; in public-issue discussion, conditions for mutual encounter should be preserved; and key algorithmic decisions should bear a basic burden of justification. Under these conditions, the symbolic-rational wing need not remain a

subordinate layer of performance metrics and can regain an organizing force in digital communicative structure.

6. Conclusion

6.1. Key findings

The authors conclude that platform-mediated communication exhibits a persistent imbalance in communicative structure, and that widely reported outcomes such as polarization and unstable trust are better read through this lens than as isolated platform failures or moral decay [49]. "Structural" does not imply that symbolic-rational practices disappear. Reason, recognition, and justification continue to occur, but over time they are more likely to be deferred and compressed, and then absorbed into the adjustable logic of platform apparatuses. The result is a durable shift in the relative weight of the two wings.

Datafied platforms are pivotal to this shift. Interface, infrastructure, and model form a reinforcing configuration that reshapes entry, reach, and evaluation [8, 12]. Eligibility to enter, conditions of mutual visibility, and criteria of "effective" conduct are increasingly shaped upstream through apparatus design rather than secured through publicly contestable procedures. Justification is thereby recoded as performance and effectiveness rather than reasons open to public scrutiny. Reinforcement across the three layers keeps communication structurally oriented toward extraction and prediction across entry, reach, and evaluation.

The authors therefore treat "imbalance" as a reproducible structural tendency. When entry is rendered capturable, reach is platformized, and evaluation is metricized—and when these moves are coupled within the same apparatus configuration—the material-institutional wing tends to secure an upstream advantage and become normalized as default conditions. The symbolic-rational wing is not eliminated, but is more often positioned downstream as an ex post layer of explanation or secondary constraints. Historical materialism specifies why this tendency can persist by tracing how forms of intercourse couple with productive forces and relations of production [22]. *The Theory of Communicative Action* clarifies what is at stake normatively: under this tendency, the lifeworld-reproductive conditions of reason, recognition, and justification become harder to sustain as relatively autonomous organizing conditions [23]. Our concluding claim is thus not merely that platforms influence communication, but that apparatus configurations stably reallocate communicative conditions across entry, reach, and evaluation—an allocation that grounds the normative implications above.

6.2. Contributions and normative implications

Our main theoretical contribution is a mechanism framework of communicative structure with two wings and three layers. The two wings capture shifting relative weight between material-institutional and symbolic-rational mechanisms. The three layers specify the differentiated roles of interface, infrastructure, and model across entry, reach, and evaluation. The authors operationalize the symbolic-rational wing through reason, recognition, and justification. The framework turns broad labels into contestable structural claims about where mechanisms operate and where compression occurs, enabling structured comparison across platforms and settings.

The framework matters in three respects. First, it increases locational resolution. Existing work often foregrounds data extraction, infrastructural power, or predictive-model dominance in isolation [7, 24, 29], but then struggles to separate entry, routing, and evaluation effects or to locate where reason, recognition, and justification are displaced and functionalized. Second, it supports a stronger structural proposition. When interface capturability, infrastructural platformization of reach, and model-level metricization are coupled as a reinforcing configuration, communication is sequentially rewritten across entry, reach, and evaluation. This

increases the likelihood that it is organized around an extraction-prediction logic. Third, it is doubly anchored. Marx provides a generative account of reproduction by linking forms of intercourse to productive forces and relations of production. Habermas provides normative coordinates that make "imbalance" criterial rather than merely descriptive by specifying patterned displacement and functionalization of reason, recognition, and justification. Without the former, imbalance reads as contingency; without the latter, it collapses into moral assertion. Together, these anchors allow the framework to answer both why the pattern emerges and why it is problematic within a single logic.

Building on this diagnosis, the authors treat rebalancing as a secondary agenda with concrete apparatus-level sites. It asks how tools such as interoperability and portability, purpose limitation and explanation access, and impact assessment with external review can be inserted into the three layers, making communicative rationality institutionally contestable rather than an abstract ideal.

6.3. Scope conditions and future research

This article is scoped largely to major platforms and policy texts in European and North American settings, with attention to social media, search, and multi-sided platform ecosystems. Our discussion of Global South platform forms, tighter state–platform power relations, and the interaction between offline labor organization and digital apparatuses remains indirect and relies on prior work and conceptual extension rather than systematic comparison [50, 51]. Future research can address this limitation through a typological approach to platform governance by classifying platform forms into comparable "standard types" and assessing the strength and combination of three-layer mechanisms across types [52]. Because the evidence base here is primarily secondary, the three-layer coordinate grid is best read as a set of structured expectations rather than a settled empirical generalization.

The framework also yields concrete strategies for empirical assessment. At the interface layer, studies can compare platforms on default data-collection settings, explanation visibility, and notice-interface transparency to test whether entry is preformatted as capturable signals [24, 53]. At the infrastructure layer, protocol analysis, developer-platform research, and measurement of API use can identify systematic gaps between contractual commitments and practical interoperability, turning restricted interoperability into a comparable empirical pattern [12]. At the model layer, algorithmic ethnography, organizational inquiry, and decision-log analysis can trace how metrics are set and revised internally, and assess whether engagement, dwell time, and conversion remain dominant[5] even when they conflict with fairness, explainability, and community well-being [17].

A further step is to situate this agenda within historical materialism. Marx and Engels argue that forms of intercourse co-evolve with productive forces and relations of production and are stabilized through social reproduction [22]. If data and algorithms function as core productive forces and DPPR as a dominant production relation, then interface, infrastructure, and model can be treated as constitutive elements of a newly prevailing form of intercourse. Measures that appear local—mandated interoperability and portability, constraints on optimization metrics, or minimal apparatus space for reason, recognition, and justification—can also be read as interventions within the reproduction of the mode of production. This perspective suggests two directions. One is tracing how institutional and technical reforms re-route the reproduction of accumulation and power. The other is specifying the social and technical conditions under which the symbolic-rational wing can, via new apparatus configurations, regain a more symmetric structural position relative to the

[5] Consistent with incentive structures built around attention extraction [54].

material-institutional wing.

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