

Algorithmic Compulsion & Civic Media Utilities

A public-health and legitimacy framework for platforms that rank, monetize, and interface attention

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Abstract

Across ratings, feeds, search, and matching, the same actor *measures* attention, *monetizes* it, *optimizes* the interface to harvest more of it, and *mediates* daily decisions at civic scale. When these four functions coalesce, platforms drift from *value* toward *compulsion*, from pluralism toward *conformity*, and from open debate toward *covert agenda-setting*. We propose treating dominant attention platforms as *civic media utilities* with *public-health* stakes. Contributions: (1) a *Civic-Utility Trigger* that adds a *Compulsion Index (CI)* to necessity/dominance tests; (2) a *Duty Stack*—D1 Right to a Reason & Appeal, D2 Responsibility Trace, D3 Church/State Separation of ranking and ads, D4 Duty to Diversify (local *and* global), D5 Auditability, D6 Reversibility, D7 Child Protections; (3) *Instrumentation*—operational definitions and governance for CI, a *Variety Index (VI)*, an *Imbalance Index (II)*, and a *Responsibility Diffusion Index (RDI)*; and (4) four sector vignettes (consumer ratings, ride-hail matching, video/streaming feeds, paid search/news). We align the framework with current regulatory momentum and outline testable pilots. The opening vignette names the pattern plainly: **algorithmic opium**.

1 Introduction: from screens to systems (the “algorithmic opium” problem)

A metro at night: heads bowed, thumbs flicking. What looks like personal habit is, at population scale, *engineered compulsion*—infinite scroll, autoplay, streaks, variable rewards—optimized against proxies like watch-time and return probability. Consequences are no longer private foibles: *attention depletion*, *political polarization*, *reputation economies*, and *opaque allocation* of work, money, and visibility.

We unify four problem areas—**ratings, matching, feeds, search/news**—as faces of one mechanism: *measure* → *monetize* → *optimize* → *interface*. At civic scale these systems function like *utilities* (eat, move, learn, decide) but lack *utility-grade duties*. Our aim is neither puritan refusal nor naïve optimism, but *governable alignment* of powerful systems with human flourishing—online and off.

Contributions. We (i) specify when a platform crosses into *civic-utility* status; (ii) articulate *non-negotiable duties* that follow; (iii) propose *indices* regulators, researchers, and product teams can compute and debate; and (iv) sketch enforceable pathways and near-term pilots.

2 Theoretical lens (very brief)

We draw on: Arendt (great harms from *thoughtless systems*); Foucault (power in *categories, labels, dashboards*); Mill (liberty + *harms that scale*); Dewey (publics require *shared inquiry*); Weil & Han (attention as moral resource; *self-exploitation*); Du Bois & Said (measurement, representation, power); Kant tempered by Derrida (persons deserve *publicly justifiable reasons*); and Bateson (system-level mislearning needs system-level correctives). Zuboff's shift from surveillance to *instrumentarian* shaping grounds the public-health frame: platforms increasingly *author* behavior (Zuboff 2019; Wu 2016; Pasquale 2015; Cohen 2019).

3 When a platform becomes a civic media utility

A platform triggers *public-interest duties* when ≥ 4 hold:

1. **Necessity:** mediates essential functions (eat, move, learn, work, decide).
2. **Dominance:** few substitutes; high market power.
3. **Externalities:** societal spillovers (attention health, polarization, business viability).
4. **Asymmetry:** users or complements cannot negotiate.
5. **Lock-in:** high switching costs (network/data/reputation captivity).
6. **Compulsion (new):** a *Compulsion Index (CI)* above threshold for relevant cohorts.

We add *Compulsion* because attention harms are *public-health* harms: population-level, dose-dependent, measurable, and design-induced.

4 The Duty Stack

If the trigger fires, the platform owes:

- D1. Reason & Appeal** Domain-appropriate explanations for impactful decisions; timely appeals that can *change outcomes*.
- D2. Responsibility Trace** A signed *accountability chain* across the pipeline (“who could have prevented this harm?”).
- D3. Rank \neq Ads** Hard walls between ranking/search/editorial and advertising/revenue optimization; documented conflicts and independent oversight.
- D4. Diversify (Local & Global)** **D4-L:** maintain a default *Variety Index (VI)* floor; expose users to high-quality dissent; a user-visible *Variety Dial* with a diversity-weighted default. **D4-G:** *interoperable pluralism*—shared provenance/contestation protocols; *model passports* (training regions, value overlays, allowed uses); *dataset federations* governed by represented communities; *humanitarian compute corridors*.
- D5. Auditability** External testing; publish failures/corrections. For ratings/moderation: *open case-law* (anonymized decisions & rationales).
- D6. Reversibility** *Regret-minimizing* design: undo decisions; repair reputational/economic harms.
- D7. Child Protections** For minors: no *infinite scroll*, no *public performance metrics*, no *night pings*; enforce ceilings; household sabbath and school-mode integrations.

Relation to “information fiduciaries”. We share the aims (care, loyalty) but avoid importing fiduciary law’s vagueness/capture risk. We specify measurable duties (D1–D7), structural separation (D3), and public auditability (D5) (Balkin 2018; Pasquale 2015; Khan 2017).

5 Instrumentation: indices you can compute (and govern)

5.1 Compulsion Index (CI)

Subscales (0–1; 28-day window; cohort-specific): **NU** night-use spike; **Tol** tolerance (minutes \uparrow while satisfaction/novelty \leftrightarrow / \downarrow); **W** withdrawal/relapse (post-break & post-warning re-engagement); **Disp** displacement (sleep loss, missed commitments); **LoC** loss-of-control (days exceeding self-set limits). Weights start equal (0.2); refine via pre-registered models predicting adverse outcomes (sleep, WHO-5/PHQ-9 deltas). Adult hazard bands (informational): *Candy* ($\leq p50$), *Beer* ($p50$ – $p80$), *Tobacco* ($p80$ – $p95$), *Opioid* ($\geq p95$ and risk-ratio ≥ 2.0). For minors, features strongly tied to high CI are disallowed regardless of band.

5.2 Variety Index (VI)

$$VI = \alpha H(\text{category distribution}) + \beta \text{Novelty} + \gamma \text{DissentExposure}$$

H : normalized entropy; Novelty: share from categories unseen in prior window; Dissent: rate of high-quality counter-positions from credible, diverse sources. Start $\alpha = \beta = \gamma = 1/3$; tune via pre-registered experiments to maximize comprehension/retention without spiking churn. Empirical work on “filter bubbles” is mixed; personalization interacts with *pre-existing social clustering*. VI/II and D4 target the combined, self-reinforcing dynamic—raising exposure diversity *without* imposing a single ideological “center”.

5.3 Imbalance Index (II) for news

Reference spectrum R : ensemble from cross-ideological panels, a balanced outlet basket, and a dynamic *claim graph*. Metric: Jensen–Shannon divergence between a story’s stance distribution and R , topic-weighted. Trigger: $II > \tau \Rightarrow$ *Counterpoint Adjacency* inline; τ set by field tests maximizing understanding & reducing extremity.

5.4 Responsibility Diffusion Index (RDI)

Model the decision pipeline as a DAG:

$$RDI = 1 - (\lambda_1 \text{TraceCompleteness} + \lambda_2 \text{PreventiveControls} - \lambda_3 \text{Time-to-Accountability})$$

Log each hop; publish λ weights; aim RDI \downarrow annually.

6 Vignettes (neutral, cross-regional)

Consumer ratings oligopoly. Star inflation (4+ default), pay-to-promote badges, soft suppression, opaque disputes. \Rightarrow D1 reasons & appeal; D2 full trace; D5 open case-law; anti-gaming (blind sampling; calibrated distributions; penalties for gift-for-stars schemes).

Ride-hail matching. Paid driver priority; opaque matching. \Rightarrow Ban pay-to-prioritize; allow justified priority (safety/medical/ADA) with logged reasons; D1/D2/D6 explanations, trace, and remedies; portability of reputations across apps.

Video/streaming feeds. Runaway loops; night-time compulsion; narrow diets. \Rightarrow user-visible CI & VI; Variety Dial defaulted above comfort on civic-utility platforms; D4 duty to diversify; D7 remove infinite scroll/public metrics for minors; night locks/ceilings.

Paid search & news. Rank entangled with ads; novelty/engagement-heavy lists; covert agenda-setting. \Rightarrow D3 rank \neq ads (structural separation); in-article funding/stance disclosures; Counterpoint Adjacency when II exceeds threshold; correction ledgers; audits for rank drift under ad policy changes (Gillespie 2018; Helberger 2020).

7 Implementation & enforcement

Designation & risk regime (CMU). Civic-media-utility status triggers annual risk assessments, measurement APIs for CI/VI/II/RDI, and the Duty Stack; non-compliance \rightarrow corrective orders/fines (analogous to systemic-risk regimes in the EU DSA) (European Union 2022b).

Separation orders (D3). Organizational/firewall separation of ranking from ads; conflict-of-interest codes; independent certification (DMA-style obligations on gatekeepers) (European Union 2022a).

Private rights & safe harbors. Right of action for harms tied to CI/RDI failures; safe harbor with independent certification + effective D1 appeals.

Procurement & distribution levers. Public procurement and app stores require in-app hazard bands, child protections, appeal routes, and open case-law (for minors, align with duty-of-care approaches such as the UK Online Safety Act) (UK Parliament 2023).

Co-regulatory standards & audits. Standards track (ISO/IEEE-style) for CI/VI/II/RDI; third-party conformity assessments; civil-society sandbox access.

8 Related work (positioning, concise)

This framework sits alongside: attention markets (Wu 2016); surveillance/instrumentarian capitalism (Zuboff 2019); black-box accountability (Pasquale 2015); gatekeeper/systemic-risk regimes (European Union 2022b; European Union 2022a); moderation and platform responsibility (Gillespie 2018); antitrust critiques of integrated platforms (Khan 2017); information-fiduciary proposals/criticisms (Balkin 2018); pluralism and opinion power (Helberger 2020); protocols-over-platforms (Masnick 2019). Our distinct move fuses *public-health instrumentation (CI)* with *legitimacy duties (D1–D7)* and a *globalized D4*.

9 Objections & replies (compact)

Paternalism. Adult labels are informational; minors face feature bans (not viewpoint bans).

Chilling innovation. Duties trigger only at civic-utility thresholds; separation reduces conflicts, not creativity.

Free speech. We regulate *process* (reasons, appeals, diversity defaults), not viewpoints; Counterpoint Adjacency increases speech quality.

Gaming/vagueness. Multi-proxy, auditable indices; publish methods; pre-register changes; invite replication.

Regulatory capture. Open metrics, case-law, independent audits, portability/interoperability, and humanitarian carve-outs mitigate capture.

10 Ethical stance

Not a ban on platforms or personalization. A call to: treat *compulsion* as public health; restore *due process* and *accountability*; protect *children*; preserve *cultural biodiversity* (including *off-screen* life); and maintain *interoperable pluralism* across civilizational lines.

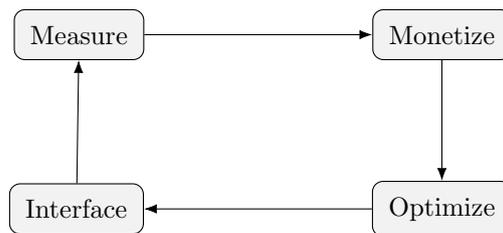
11 Research agenda (pilots)

1. Top-50 app CI classification (hazard bands) → validate vs sleep/mood.
2. Feed trials: deploy Variety Dial → measure VI, comprehension, well-being.
3. Ratings due-process pilot: open case-law → appeal effectiveness & trust.
4. Search/news audits: compute II → test Counterpoint Adjacency on understanding/extremity.
5. RDI audits: trace completeness & time-to-accountability across two platforms.
6. Global D4 pilots: model passports + dataset federation for an under-represented language.

12 Conclusion

When ranking, revenue, and interface optimization live in the same black box at civic scale, societies drift toward *compulsion*, *conformity*, and *covert agenda-setting*. Treating dominant attention platforms as *civic media utilities* clarifies when *public-interest duties* apply and what they require. The *Compulsion Index* and *hazard bands* pull attention harms into public health; the *Duty Stack* restores *due process*, *accountability*, and *pluralism*; the *Variety/Imbalance* and *Responsibility Diffusion* indices give us dials to tune and standards to enforce. The task is to align the infrastructures of attention with human flourishing—locally and globally—without losing the creativity that made them powerful.

Figures (schematics)



Societal outcomes:
compulsion, conformity, covert agenda-setting

Figure 1: The civic-scale attention machine: measure → monetize → optimize → interface (with societal feedback).

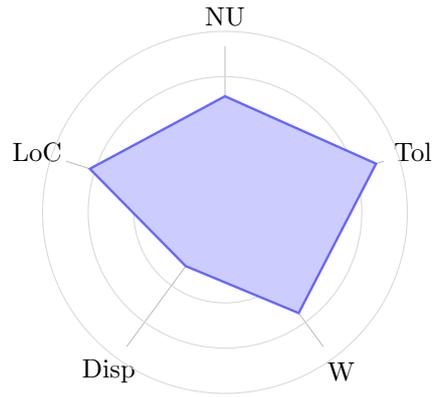


Figure 2: Compulsion Index (CI) radar (illustrative): five subscales (vertices lie exactly on each axis).

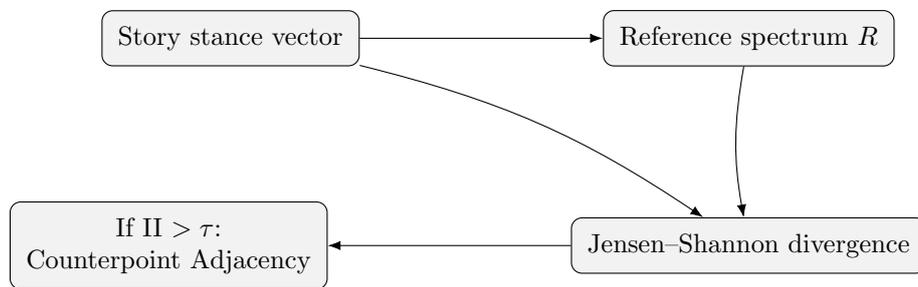


Figure 3: Imbalance Index (II): compare stance to a plural reference spectrum; trigger inserts counterpoints inline (non-overlapping flows).

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