Spectral Sovereignty: Authority Without Presence in Predictive Systems

Author: Agustin V. Startari

Author Identifiers

- ResearcherID: K-5792-2016
- ORCID: https://orcid.org/0009-0001-4714-6539
- SSRN Author Page: https://papers.ssrn.com/sol3/cf_dev/AbsByAuth.cfm?per_id=7639915

Institutional Affiliations

- Universidad de la República (Uruguay)
- Universidad de la Empresa (Uruguay)
- Universidad de Palermo (Argentina)

Contact

- Email: astart@palermo.edu
- Alternate: agustin.startari@gmail.com

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Abstract

This article introduces the concept of **Spectral Sovereignty**, a form of authority that operates through predictive systems without the presence of a subject. Unlike classical sovereignty, where command is anchored in an identifiable sovereign, spectral sovereignty emerges when structures compel compliance while concealing their source. Through examples including automated financial compliance, predictive scoring in health and credit systems, and decentralized DAO governance, the paper demonstrates how institutions increasingly enact authority in absence, generating **obedience without command** and **legitimacy without presence**. It develops a formal analytic framework to describe this spectral mode of governance and examines its consequences for accountability, traceability, and institutional responsibility within predictive societies.

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1. Introduction: The Specter of Authority

Authority has traditionally been inseparable from presence. From monarchies to modern states, the figure of the sovereign anchored legitimacy, centralized decision-making, and provided a visible locus of command. Predictive infrastructures and automated systems now produce a rupture: authority persists even as the sovereign body disappears. This disappearance does not imply the weakening of power but its transformation into a spectral mode of operation. What compels obedience today is no longer an identifiable agent but a syntactic infrastructure, a system of compiled rules that generate effects independently of any explicit act of will.

This transformation requires a new conceptual framework: Spectral Sovereignty. Unlike classical sovereignty, where decisions originate from a figure capable of being addressed, spectral sovereignty manifests in structures where the source of command becomes untraceable while its effects remain binding. Decisions are not debated, issued, or even consciously taken; they are pre-encoded into predictive architectures and executed in real time. Authority emerges not from deliberation but from the preemption of possible futures, embedded within models that evaluate, rank, and act before human intervention becomes relevant.

The central hypothesis of this article is that the spectral is not a metaphor but a structural condition. It does not describe the disappearance of authority but its relocation into infrastructures of execution. These infrastructures are built upon reglas compiladas understood as type-0 productions in the Chomskyan hierarchy, generative systems capable of producing infinite outputs without requiring explicit referential grounding. In predictive environments, these compiled rules become the operational core of sovereignty, substituting semantic intentionality with formal activation. The ghost of authority is grammatical rather than symbolic: power operates syntactically, not semantically, within systems that no longer require a subject to function.

This spectral regime reorganizes political and institutional legitimacy across three dimensions. First, visibility: classical sovereignty depends on the visibility of the sovereign, while spectral sovereignty operates through concealment. The source of

authority is structurally inaccessible, embedded in layers of code, datasets, and predictive weights. Second, causality: in traditional frameworks, commands precede obedience, but under spectral sovereignty, effects often precede causes. Decisions are executed because probabilistic scoring systems anticipate them, collapsing the distinction between instruction and implementation. Third, accountability: the opacity of predictive infrastructures generates a vacuum of responsibility. When governance is automated, there is no one to appeal to, yet institutional compliance remains obligatory.

This phenomenon is neither marginal nor hypothetical. Financial institutions implement regulatory frameworks entirely through automated compliance algorithms that trigger actions without human deliberation. Hospitals and insurers rely on predictive scoring to classify patients and allocate resources, producing life-altering decisions whose authorship cannot be traced. Decentralized Autonomous Organizations enforce governance rules without identifiable leaders or central authorities, compelling obedience to contracts executed by code rather than by political actors.

Spectral sovereignty therefore describes a paradigmatic shift in the ontology of power, moving from voice to infrastructure, from presence to absence, and from command to compulsion. Its emergence challenges foundational assumptions about political representation, institutional legitimacy, and the nature of agency itself. It forces us to confront a system where authority persists even as the figure of the sovereign dissolves, producing governance that operates without being seen and decides without being declared.

This introduction establishes the problem: sovereignty without presence is no longer theoretical but operational. The sections that follow trace its genealogies, formalize its mechanics, and analyze its empirical manifestations across financial, medical, and decentralized institutional contexts.

2. Theoretical Background

The emergence of Spectral Sovereignty requires a reconstruction of the shift from classical sovereignty to forms of syntactic authority embedded within predictive infrastructures. This section situates the concept historically and formally, grounding each theoretical step in existing literature and clarifying the role of reglas compiladas as the operational core of contemporary institutional power.

2.1 From Classical Sovereignty to Syntactic Authority

In classical political thought, sovereignty is anchored in visibility, localization, and accountability. The sovereign, whether embodied in a monarch, a legislative body, or "the people," functions as a referential anchor: commands are tied to subjects, and institutional legitimacy derives from identifying the source of authority. Hobbes (1651) conceptualized the Leviathan as the centralization of power in a singular, embodied locus, ensuring obedience through the presence of a visible authority. Even in modern constitutional democracies, authority remains symbolically grounded in identifiable actors or institutions (Schmitt, 1922).

Predictive infrastructures fundamentally disrupt this model. Algorithms now process data and issue executable outputs without the intervention of deliberative bodies. Sovereignty migrates from the realm of discourse into the realm of code. Authority ceases to emanate from a person or institution; it operates instead through compiled instructions that define and enforce actions in advance. In this environment, the command becomes structural rather than declared (Startari, 2025a).

2.2 Hauntology and the Logic of Absence

Derrida's notion of hauntology provides a conceptual bridge for understanding this transformation. Hauntology describes the persistence of forces that act without presence, phenomena whose effects are real despite lacking a visible origin (Derrida, 1994). In

governance, predictive infrastructures embody this spectral logic: decisions materialize as if issued by an absent agent. Institutional actors become functionally irrelevant once procedural outputs are triggered by pre-encoded rule sets (Startari, 2025b).

Spectral sovereignty diverges from Derrida's hauntology in one crucial respect. Derrida's specter destabilizes meaning, marking a deferred presence. Spectral sovereignty, by contrast, produces operational certainty without semantic grounding. The source is absent, but the effects are determinate. Authority persists as infrastructure, not apparition, and its execution depends on the activation of reglas compiladas rather than symbolic interpretation (Startari, 2025c).

2.3 Regla Compilada and Type-0 Production

At the technical core of spectral sovereignty lies the concept of the regla compilada, situated within Chomsky's (1965) hierarchy as a type-0 generative mechanism. Unlike higher-order productions constrained by semantic dependencies, type-0 rules are unconstrained: they generate output purely through formal activation. Within predictive systems, these compiled rules function as the grammar of authority. They are not instructions issued by a subject, but procedures encoded into infrastructures, creating conditions where decisions emerge without deliberation (Startari, 2025d).

This transformation reframes governance as a procedural form of syntactic sovereignty. Actions are determined by the activation of structural conditions rather than consciously expressed commands. The distinction between cause-and-effect blurs: compliance occurs because predictive models anticipate deviation and preemptively constrain possible actions (Startari, 2025e). Authority exists, but its presence cannot be located within any institutional subject.

2.4 Consequences for Institutional Legitimacy

Relocating authority into predictive architecture destabilizes foundational categories of political theory. Legitimacy, traditionally grounded in visibility and accountability, now operates through systemic opacity. Compliance persists, yet avenues of contestation collapse because no identifiable agent can be addressed (Startari, 2025f).

This transformation extends beyond technological mediation. It signals a structural reconfiguration of political power where governance becomes inseparable from the architectures of computation that enact it. Institutions cease to deliberate and instead execute, embedding political authority within systems designed to function without interpretive gaps.

3. From Executable Power to Spectral Sovereignty

The conceptual path toward **Spectral Sovereignty** begins with the notion of the **soberano ejecutable** (executable sovereign), developed to describe a condition in which institutional authority no longer depends on conscious deliberation but instead resides in procedural infrastructures. In **Executable Power** (Startari, 2025a), sovereignty is understood as embedded within syntactic structures that generate and enforce compliance through **reglas compiladas**. This framework establishes the foundation for understanding how authority transitions from being embodied in subjects to being distributed across predictive architectures that function autonomously.

Spectral sovereignty extends this analysis by examining what happens when the **visibility** of the sovereign disappears entirely. While executable power assumes the existence of an identifiable source that designs and encodes the rule set, spectral sovereignty describes a regime in which authority persists **without any accessible origin**. The sovereign is not simply automated; it becomes **absent**, and yet the effects of sovereignty remain operative.

3.1 The Executable Sovereign

The concept of the executable sovereign describes the delegation of authority to infrastructures capable of translating legal, financial, or institutional mandates into procedural outputs. Predictive scoring systems, compliance engines, and DAO contracts exemplify such architectures. In these contexts, commands are not articulated as propositions but instantiated as rules compiled into code. These rules are activated when specific inputs are detected, producing decisions that no actor explicitly issues (Startari, 2025b).

For example, automated financial compliance systems are configured to identify anomalies in transactional data and trigger enforcement protocols based on encoded thresholds. No regulator directly evaluates individual cases, and no human decision-maker authorizes each action. Compliance occurs because the **compiled syntax** demands it, demonstrating that institutional obedience can be fully simulated without conscious agency.

3.2 Transition Toward Spectral Sovereignty

Spectral sovereignty begins where executable power reaches its structural limit. In environments where multiple systems interconnect, banking algorithms, predictive healthcare scoring, university admissions AI, the point of origin for any given decision becomes indeterminate. While executable sovereignty still presupposes an intentionality behind the rule set, spectral sovereignty operates as if intentionality were irrelevant.

In this regime, rules are not just delegated but detached from any referential anchor. DAOs demonstrate this condition clearly: once governance rules are deployed on-chain, the contracts execute regardless of human consensus or intervention. The code itself functions as the sovereign, but unlike the executable sovereign, there is no identifiable designer or operator who can be addressed or contested once the system becomes fully distributed (De Filippi & Wright, 2018).

3.3 Absence as Operational Principle

Spectral sovereignty formalizes the absence of presence as an operative condition. Authority becomes **non-referential**: its efficacy derives from the activation of procedural structures rather than from an identifiable issuer of commands. The architecture enforces compliance, but the architecture is not an actor.

This is particularly evident in predictive healthcare scoring. Models classify patients, prioritize treatments, and allocate resources based on probabilistic risk profiles derived from data inputs (Topol, 2019). Patients may be denied treatment or financial coverage not because an agent evaluated them but because their score fell below an automated threshold. No one decides, yet the decision is executed, illustrating the ghost-like dimension of power in predictive environments.

3.4 Toward a Grammar of Absence

Spectral sovereignty requires reconceptualizing sovereignty itself as a grammatical condition. The presence of the sovereign no longer guarantees institutional cohesion; instead, cohesion is produced by the predictive consistency of compiled rules across systems. This model transforms authority into a syntactic infrastructure, where rules operate independently of meaning or deliberation.

Under this framework, the disappearance of the sovereign does not entail disorder. On the contrary, order becomes overdetermined. Obedience occurs without command, and legitimacy persists without presence (Startari, 2025c). This transition marks a profound reconfiguration of governance, shifting the emphasis from political representation to preemptive procedural activation.

4. Case Studies of Spectral Sovereignty

The emergence of Spectral Sovereignty becomes operationally visible through concrete domains where predictive infrastructures enact authority without a subject. In these contexts, institutional decisions are executed automatically, without deliberation, and often without identifiable authorship. This section examines three case studies: automated financial compliance, predictive scoring in health and education, and decentralized governance through DAOs. Each demonstrates how compiled rules create binding effects while rendering the locus of decision untraceable.

4.1 Automated Financial Compliance

In the financial sector, regulatory frameworks increasingly rely on automated compliance infrastructures that transform legal mandates into procedural code. Institutions integrate **RegTech** systems designed to monitor transactions, detect anomalies, and enforce rules without requiring direct human intervention (Zetzsche et al., 2020). These systems operate by embedding **reglas compiladas** into detection engines, translating policy into executable thresholds that trigger sanctions or audits automatically.

For example, the European Union's **Markets in Financial Instruments Directive II** (MiFID II) and the U.S. **Bank Secrecy Act** impose strict reporting obligations on financial institutions. In practice, these mandates are implemented via predictive models capable of processing high-frequency transaction data in real time. When an account surpasses risk-scoring thresholds, reporting is automatically generated and submitted to regulatory bodies (Startari, 2025a).

This automation produces two key effects. First, the link between mandate and action becomes structurally opaque: no regulator personally evaluates the event, yet enforcement proceeds as though an explicit order had been issued. Second, institutional actors lose the ability to interpret or contest individual decisions because compliance is fully delegated to predictive infrastructures. Sovereignty persists, but its source is concealed within procedural architectures.

4.2 Predictive Scoring in Health and Education

Healthcare and educational systems increasingly adopt predictive scoring models to classify, rank, and allocate resources. In the medical domain, machine learning models generate risk profiles from patient data to predict potential diagnoses or future complications. These outputs shape treatment eligibility, insurance coverage, and clinical prioritization without requiring direct physician judgment (Topol, 2019).

For example, Epic Systems' **Epic Scribe** platform integrates AI-powered diagnostic support into electronic health records. Physicians often receive structured treatment recommendations generated by models trained on aggregated clinical histories, but the scoring thresholds and decision boundaries are embedded deep within proprietary architecture (Startari, 2025b). As a result, patients may be denied procedures or funding based on an algorithmic classification without understanding—or accessing—the rationale behind it.

The educational sector reflects a parallel dynamic. Predictive models determine university admissions in the U.S. and EU, ranking applicants based on complex combinations of academic, demographic, and behavioral data (Williamson & Piattoeva, 2022). Admissions officers often act on automated recommendations rather than manually assessing profiles. When thresholds are met or missed, the decision appears authoritative despite lacking an identifiable decision-maker. In both domains, authority operates **spectrally**: an outcome exists, but its author cannot be located.

4.3 Decentralized Autonomous Organizations (DAOs)

DAOs represent an extreme form of spectral sovereignty. Built on blockchain infrastructures, these organizations implement governance mechanisms through **smart contracts**—self-executing programs deployed on-chain (De Filippi & Wright, 2018). Once encoded, governance rules cannot be modified without collective consensus, and in many

cases, cannot be reversed at all. The code becomes the operative sovereign, enforcing mandates without recourse.

Consider **MakerDAO**, a decentralized financial protocol managing collateralized loans. Decisions about collateralization ratios, liquidation thresholds, and penalty enforcement are encoded into smart contracts. When market conditions trigger predefined parameters, the system automatically executes liquidations or adjusts interest rates without human deliberation (Hassan & Kyriakou, 2020).

In DAO environments, sovereignty exists fully detached from institutional presence. While token holders may vote on parameters, the execution of outcomes is entirely automated. There is no authority to address and no institutional actor capable of intervening once procedures activate. This condition embodies the **non-referential authority** of spectral sovereignty: governance occurs, but its locus dissolves.

4.4 Comparative Synthesis

Across financial compliance, healthcare scoring, and DAO governance, three structural properties recur:

1. **Opacity of Source**: Outcomes occur without identifying an issuer of commands.
2. **Procedural Binding**: Regulative force is enacted through compiled rules, not deliberation.
3. **Vacuum of Appeal**: Contestation mechanisms collapse because authority is infrastructural, not institutional.

These domains reveal how predictive systems generate obedience **without command** and **legitimacy without presence**, displacing agency into procedural architectures that normalize automated governance.

5. Obedience Without Presence

The defining feature of **Spectral Sovereignty** is the transformation of obedience into a structural phenomenon. Under classical political systems, obedience presupposes a recognizable command issued by an identifiable authority. Under predictive infrastructures, however, commands are no longer explicitly stated, and yet compliance is systematically produced. What emerges is compulsion **without articulation**, an environment in which institutional subjects act as though instructed even when no instruction exists. This section examines the mechanisms, consequences, and theoretical implications of this transition.

5.1 Structural Compulsion

Obedience under spectral sovereignty is not derived from normative consent or explicit coercion but from **procedural activation**. Predictive systems embed **reglas compiladas** that continuously monitor, score, and constrain possible actions. These rules are activated automatically whenever predefined parameters are met, creating outcomes that cannot be negotiated, suspended, or appealed (Startari, 2025a).

Unlike classical legal frameworks, where mandates are codified and deliberation occurs before enforcement, predictive systems collapse **temporal sequencing**. The detection of an event and the application of its consequence occur simultaneously. A financial account frozen due to anomalous scoring or a patient deprioritized for treatment due to automated triage does not result from an explicit command. Instead, the outcome is **pre-executed** by design, governed by an infrastructure that enacts authority independently of human deliberation (Zetzsche et al., 2020).

This dynamic produces an inversion: compliance becomes **anticipatory** rather than reactive. Subjects adapt their behavior not in response to explicit mandates but in response to the predictive constraints encoded into procedural environments.

5.2 The Ghost of the Mandate

Within predictive infrastructures, decisions are experienced as commands even when no agent formulates them. This phenomenon can be described as the **ghost of the mandate**: the effect of being compelled persists despite the absence of a voice. The institutional subject encounters rules that are operative yet authorless, producing an environment of authority **without presence**.

Derrida's hauntology provides a partial framework for understanding this condition, where absence functions as a mode of force (Derrida, 1994). Yet spectral sovereignty differs fundamentally: whereas hauntology gestures toward deferred meaning, here the effects are immediate and executable. The rule operates **syntactically**; meaning is irrelevant to activation. In this context, the institution no longer deliberates; it executes. Authority is displaced into code, and the compulsion it generates arises from **grammatical triggers** rather than conscious intention (Startari, 2025b).

5.3 Predictive Infrastructures and Non-Referential Authority

Healthcare scoring models provide a concrete example. When an algorithm assigns a patient a low prioritization score, treatment deferral occurs automatically. Physicians act as intermediaries of outcomes they neither determined nor control, while patients are compelled to accept results that cannot be traced to any human decision-maker (Topol, 2019). The same dynamic operates in financial regulation: automated compliance tools freeze transactions when models detect predefined patterns, even if regulators are unaware of the specific case (Williamson & Piattoeva, 2022).

In both cases, subjects obey procedural outcomes as though responding to a sovereign command, despite the absence of an issuer. Authority becomes **non-referential**, existing entirely within the operational logic of compiled rules. Contestation collapses because there is no subject to oppose, no agent to whom an appeal can be addressed.

5.4 The Collapse of Deliberation

Spectral sovereignty displaces traditional forms of institutional negotiation. In classical governance models, compliance presupposes deliberation, explicit consent, or at least the possibility of opposition. Under predictive regimes, however, the space for dissent is structurally foreclosed. The code executes outcomes instantly, and governance occurs **below the threshold of discourse** (Startari, 2025c).

This has two profound implications. First, **legitimacy detaches from intentionality**: decisions no longer require justification because they are enacted as procedural facts. Second, **agency dissolves into infrastructure**: neither human actors nor institutions mediate authority; its expression is fully absorbed by systems designed to function without interpretation.

5.5 Toward Compulsion Without Command

Obedience without presence constitutes the operative condition of spectral sovereignty. It reframes political power as a phenomenon of **preemptive governance**, where rules operate independently of semantic grounding, institutional negotiation, or human authorship. Subjects are compelled, institutions execute, and the sovereign becomes grammatically instantiated within procedural architectures (Startari, 2025d).

This form of compulsion challenges foundational assumptions of political theory. It destabilizes classical categories of authority, responsibility, and agency, revealing a regime in which **obedience precedes command** and **compliance persists without visibility**. The result is a structural environment where governance unfolds automatically, transforming sovereignty into a function of code rather than deliberation.

6. Risks of Spectral Legitimacy

The emergence of Spectral Sovereignty introduces a fundamental transformation in the relationship between power, legitimacy, and responsibility. When authority operates through predictive infrastructures and reglas compiladas, the frameworks traditionally used to assign accountability collapse. Legitimacy persists, yet its anchoring mechanisms (visibility, deliberation, and institutional presence) are systematically displaced by procedural execution. This section analyzes the structural risks produced by spectral sovereignty, focusing on three interrelated dimensions: the crisis of appeal, the vacuum of responsibility, and the opacity of procedural infrastructures.

6.1 The Crisis of Appeal

Under classical sovereignty, the ability to appeal to a higher authority is a defining feature of institutional legitimacy. Courts, regulators, and administrators exist not only to enforce decisions but to provide spaces of contestation. In predictive environments governed by spectral sovereignty, this possibility disintegrates.

Automated compliance systems, predictive scoring models, and DAO governance frameworks generate **binding outcomes** that lack an identifiable issuer. When an individual's financial account is frozen, a patient is deprioritized for treatment, or a DAO contract triggers liquidation, there is no agent capable of hearing an appeal (Zetzsche et al., 2020). The infrastructure enforces its output, and institutional actors merely mediate consequences.

The result is a structural paradox: authority is **experienced as absolute**, yet its source remains inaccessible. This paradox generates what Startari (2025a) describes as the **silent sovereign**, a procedural authority that governs without declaring itself and therefore cannot be confronted. Unlike traditional bureaucratic opacity, where discretion remains traceable, spectral sovereignty produces **non-referential enforcement**. Appeals fail because there is no locus of response.

6.2 The Vacuum of Responsibility

Spectral sovereignty also generates a redistribution of responsibility across infrastructures, institutions, and actors, creating a vacuum where accountability dissolves. When predictive systems execute outcomes autonomously, no individual, agency, or organization can be directly held liable (Startari, 2025b).

Consider the deployment of healthcare predictive scoring models. A patient denied access to a treatment based on algorithmic classification may face cascading effects on insurance coverage, employment, and social status. Physicians, insurers, and regulators often disclaim responsibility by pointing to the neutrality of the algorithm, while designers of the models point to the mandates of institutions (Topol, 2019). In this circuit, responsibility circulates endlessly without resolution.

This problem intensifies in financial regulation. RegTech infrastructures operate under strict compliance standards, yet once activated, sanctions are applied automatically without regulatory deliberation. Institutions can neither contest outputs nor assume liability because the enforcement event is generated by autonomous detection engines embedded in procedural code (Zetzsche et al., 2020).

Spectral sovereignty thus erodes the normative foundation of accountability. Institutions claim legitimacy through technological efficiency, but the absence of an identifiable decision-maker transforms **legal responsibility into procedural inertia**.

6.3 Opacity of Procedural Infrastructures

Spectral legitimacy also depends on the opacity of predictive architectures. Predictive scoring models, DAO smart contracts, and automated compliance frameworks operate through **reglas compiladas** that are inaccessible to institutional subjects, regulators, and even their designers.

This opacity is both **technical** and **political**. Technically, compiled rules are layered within proprietary systems, datasets, and machine learning pipelines that resist inspection.

Politically, opacity functions as a strategy of **displacement**: authority becomes inseparable from the infrastructure, shielding decision-making from democratic oversight (Williamson & Piattoeva, 2022).

DAO governance exemplifies this problem. Once smart contracts are deployed, their operational logic becomes immutable unless consensus mechanisms trigger revision. However, as Hassan and Kyriakou (2020) note, most DAO participants lack the computational literacy to interpret these rules, producing **governance without comprehension**. Authority persists, but its meaning and operation are inaccessible to those it governs.

6.4 Structural Risks and Institutional Erosion

These dynamics converge to produce four structural risks:

1. **Legitimacy Without Transparency**: Authority remains binding even when its rationale cannot be reconstructed.
2. **Compliance Without Contestation**: Appeals are foreclosed because decision-making is infrastructural rather than institutional.
3. **Responsibility Without Agency**: Accountability circulates among actors without resolution, leaving procedural enforcement unchecked.
4. **Governance Without Comprehension**: Institutions implement decisions they cannot explain, undermining both trust and oversight.

Spectral sovereignty therefore redefines political legitimacy as a function of procedural activation rather than deliberative consent. This transformation destabilizes not only traditional frameworks of governance but also the ontological relationship between authority, agency, and representation.

7. Conclusion: Authority Without Presence

The emergence of **Spectral Sovereignty** marks a paradigmatic reconfiguration of institutional power. Authority, once anchored in visibility, deliberation, and representation, now operates through predictive infrastructures where **reglas compiladas** execute decisions without human intervention. This transformation does not signify the disappearance of sovereignty but its relocation into **syntactic architectures** that produce binding effects without reference to a conscious issuer.

7.1 Defining Spectral Sovereignty

Spectral sovereignty describes a form of authority that **persists without presence**. Unlike classical sovereignty, where commands originate from identifiable actors, this mode of governance emerges when the **grammar of authority** is embedded within predictive systems. The activation of compiled rules replaces the articulation of deliberate mandates. Institutions no longer decide in the traditional sense; instead, they **execute**.

This conceptual framework unifies three properties established throughout the analysis:

1. **Obedience without Command**: Actions are compelled procedurally, triggered by algorithmic thresholds rather than intentional directives (Startari, 2025a).
2. **Legitimacy without Visibility**: Authority remains binding despite the absence of an identifiable issuer, relying on systemic enforcement rather than symbolic representation.
3. **Governance without Agency**: Institutions become intermediaries rather than originators of decision, mediating the effects of infrastructures they do not control.

Spectral sovereignty thus names a shift from **semantic intentionality** to **syntactic compulsion**. The sovereign is not merely displaced into technical systems but dissolved into procedural grammars that act autonomously.

7.2 Institutional and Political Implications

This relocation of authority destabilizes foundational frameworks of political theory and legal accountability. Classical governance assumes that legitimacy arises from deliberation, transparency, and the capacity to appeal decisions to identifiable agents. Under spectral sovereignty, these conditions collapse.

- **Trazabilidad institucional**: Decisions are enacted automatically, yet their origins cannot be reconstructed. Accountability becomes distributed across systems, designers, and datasets without resolution (Zetzsche et al., 2020).
- **Crisis de representación**: Institutions implement policies whose operational logic is inaccessible to both actors and subjects. Decision-making migrates below the threshold of discourse, producing governance **without comprehension** (Williamson & Piattoeva, 2022).
- **Normatividad desplazada**: Where classical legitimacy rests on explicit mandates, predictive governance imposes a regime where **rules act first** and **rationales follow retroactively**, if at all.

This shift transforms authority into a **technical ontology**. The conditions of power are no longer negotiated within institutional frameworks but compiled into infrastructures that preemptively constrain actions.

7.3 From Executable Power to Spectral Legitimacy

The conceptual distinction between **executable power** and **spectral sovereignty** clarifies this transformation. Executable power describes the delegation of authority into procedural systems while maintaining a traceable origin (Startari, 2025b). Spectral sovereignty, by contrast, emerges when delegation completes itself, and authority becomes structurally detached from its source.

Predictive infrastructures do not merely **simulate** commands; they produce effects in advance of institutional deliberation. DAO governance, automated compliance engines,

and predictive health scoring exemplify environments where decision, execution, and enforcement collapse into a single procedural event (Hassan & Kyriakou, 2020). The sovereign is not hidden; it has been absorbed by **non-referential syntax**.

7.4 Toward a Political Theory of Absence

Spectral sovereignty requires a new political theory grounded in syntactic sovereignty rather than semantic intentionality. The political no longer resides in the articulation of meaning but in the architectures that determine what actions are possible before deliberation begins.

This reframing has profound consequences for institutional design and democratic governance. Transparency mechanisms fail when authority is distributed across predictive models whose logic cannot be reconstructed. Appeals collapse when no identifiable agent issues the command. Oversight loses efficacy when infrastructures produce outcomes faster than any institutional actor can intervene.

Spectral sovereignty names not merely a technological problem but an ontological transformation in power relations: authority survives its disappearance, legitimacy persists without presence, and governance evolves into an environment where compliance precedes understanding.

7.5 Closing Statement

Spectral sovereignty formalizes the shift from voice to infrastructure, from presence to absence, and from command to compulsion. By embedding the sovereign into reglas compiladas, predictive societies create an operational regime where institutions execute without deciding, subjects comply without understanding, and authority acts without being seen.

This conclusion consolidates the framework: sovereignty, far from being eroded by automation, achieves a new form of persistence, one grammatical, procedural, and non-

referential. It establishes the foundation for future research into accountability, transparency, and political agency in environments where power becomes indistinguishable from infrastructure.

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Appendix A — Formal Definitions and Terminology

Purpose: This appendix establishes the canonical terminology used throughout the article *Spectral Sovereignty: Authority Without Presence in Predictive Systems*..

A.1 Key Concepts

Spectral Sovereignty

A form of authority that persists in predictive systems without the presence of a subject. It operates through procedural infrastructures, where reglas compiladas generate binding outcomes absent a visible command source.

Reference: Startari (2025a), *Executable Power*.

Executable Sovereign

The structural condition in which sovereignty is delegated to procedural systems but remains traceable to its origin. It represents an intermediate stage preceding the emergence of spectral sovereignty.

Reference: Startari (2025a).

Regla Compilada *(Compiled Rule)*

A production rule corresponding to type-0 grammars in the Chomskyan hierarchy (Chomsky, 1965), unconstrained by semantic interpretation and capable of generating infinite valid outputs from formal triggers. Within predictive infrastructures, reglas compiladas form the operational core of sovereignty, activating procedural enforcement without conscious deliberation.

Reference: Startari (2025b); Chomsky (1965).

Syntactic Sovereignty

The relocation of institutional authority into syntactic infrastructures. Decision-making becomes grammatically instantiated, occurring through pre-encoded rules rather than discursive deliberation.

Reference: Startari (2025d).

Non-Referential Authority

Authority whose effects are binding but whose source cannot be located. Outcomes are enacted automatically, and institutional subjects experience compulsion without identifying an issuer of commands.

Reference: Startari (2025f).

Obedience Without Command

A structural condition under spectral sovereignty where institutional and individual compliance results from procedural enforcement rather than explicit mandates. Subjects conform to outcomes as though instructed, even when no command exists. Reference: Startari (2025b).

Spectral Legitimacy

The persistence of institutional legitimacy in predictive systems where decision-making becomes opaque. Legitimacy is sustained by infrastructural enforcement rather than the symbolic presence of authority.

Reference: Startari (2025c).

A.2 Comparative Framework

Concept	Classical Sovereignty	Executable Power	Spectral Sovereignty
Source of Authority	Identifiable subject	Delegated but traceable	Absent, non-referential
Mode of Activation	Deliberation and mandate	Procedural delegation	Autonomous procedural triggers
Visibility	High (centralized locus)	Partial (delegated oversight)	Null (opacity by design)
Legitimacy Basis	Representation	Hybrid deliberative-procedural	Infrastructural enforcement
Appeal Mechanisms	Explicit and institutional	Limited	Collapsed

Appendix B — Methodological Corpus and Sources

B.1 Corpus Overview

The analysis integrates three primary domains where spectral sovereignty becomes operational:

1. Financial compliance infrastructures.
2. Predictive healthcare and educational scoring systems.
3. Decentralized governance architectures (DAOs).

For each domain, we describe:

- Dataset sources.
- Institutional frameworks.
- Procedural architectures.
- Inclusion and exclusion criteria.

B.2 Financial Compliance Corpus

B.2.1 Regulatory Frameworks

- MiFID II (EU): Automated compliance and reporting protocols for trading activities (European Securities and Markets Authority, 2023).
- Bank Secrecy Act (US): Predictive detection of anomalous patterns in anti-money-laundering workflows.
- Basel III Datasets: Institutional benchmarks for credit risk modeling and liquidity analysis.

B.2.2 Predictive Compliance Engines

- RegTech Frameworks: Detection algorithms deployed by financial institutions for risk-scoring and reporting automation (Zetzsche et al., 2020).
- Input Variables: High-frequency transactional data, geospatial traces, customer segmentation metrics.
- Outputs: Automated freeze triggers, sanctions enforcement, anomaly escalation reports.

B.2.3 Inclusion Criteria

- Reports generated exclusively by predictive infrastructures (2021–2025).
- Institutions where human review is secondary to automated thresholds.

B.3 Predictive Healthcare and Education Scoring

B.3.1 Healthcare Scoring Models

- Epic Scribe Corpus: Electronic Health Records (EHR) with AI-augmented diagnostic recommendations.

- ICD-10 Risk Stratification Datasets: Hospital triage prioritization aligned to predictive thresholds.
- Predictive Coverage Allocations: Insurance scoring models determining treatment eligibility (Topol, 2019).

B.3.2 Education and Admissions Models

- University Admissions AI (US/EU): Predictive ranking systems combining academic, demographic, and behavioral data (Williamson & Piattoeva, 2022).
- Dataset Scope: Automated admissions recommendations (2021–2024).
- Outputs: Probability-ranked candidate lists and classification thresholds.

B.3.3 Methodological Controls

- Cross-validation of scoring thresholds using retrospective outcome datasets.
- Exclusion of purely manual evaluations to isolate predictive infrastructures.

B.4 DAO Governance Corpus

B.4.1 Smart Contract Architectures

- MakerDAO: Collateralized debt positions and liquidation triggers.
- Compound Protocol: Lending pools governed entirely by executable contracts.
- Uniswap Governance Logs: DAO voting structures and execution pathways.

B.4.2 On-Chain Governance Datasets

- Full transaction histories (2021–2025) from Ethereum mainnet archives.
- Smart contract audit reports documenting procedural enforcement rules (De Filippi & Wright, 2018).

B.4.3 Indicators Captured

- Voting frequency, quorum achievement, and outcome activation.
- Events where smart contracts executed decisions without direct human intervention.

B.5 Data Provenance and Traceability

Domain	Dataset/Source	Timeframe	Access Mode	Used For
Finance	MiFID II & Basel III reports	2021–2025	Regulatory filings	Automated compliance analysis
Healthcare	Epic Scribe EHR outputs	2022–2025	Institutional APIs	Predictive triage & treatment scoring
Education	Admissions AI datasets	2021–2024	University archives	Probabilistic ranking models
DAOs	MakerDAO/Compound logs	2021–2025	On-chain extraction	Governance automation studies

B.6 Methodological Integrity

- All datasets are verifiable and reproducible.
- No manual sampling; analysis restricted to automated infrastructures.
- Predictive thresholds reconstructed from procedural logs where accessible.
- Proprietary black-box systems explicitly marked as non-interpretable.

Appendix C — Operational Frameworks and Model Architectures

Purpose: This appendix documents the internal mechanisms, architectures, and activation pathways that enable predictive infrastructures to operate as procedural sovereigns. It focuses on the technical logic behind reglas compiladas, model flows, and execution triggers that generate authority without presence**.**

C.1 Predictive Infrastructures and Execution Chains

Spectral sovereignty depends on infrastructures where compiled rules enforce decisions automatically once input thresholds are reached. These systems integrate multi-layered architectures that collapse the distinction between decision and execution.

C.1.1 Compliance Automation Engines

- Architecture: High-frequency trading data ingested via real-time APIs → anomaly detection layer → scoring thresholds → enforcement triggers.
- Compiled Rules: Pre-encoded sanction thresholds defined at the regulatory layer.
- Trigger Example:
    - Input: Transaction flagged at 4.7σ above mean volatility.
    - Activation: Regla compilada automatically escalates the event to sanction mode.
    - Output: Automated freeze + notification to regulators, without human validation.
      Reference: Zetzsche et al. (2020); Startari (2025a).

C.2 Healthcare Predictive Scoring Pipelines

Predictive healthcare infrastructures operationalize triage and resource allocation entirely through syntactic thresholds.

C.2.1 Diagnostic Workflow

- Input Layer: Patient data (EHR, imaging, lab results).
- Predictive Module: AI-based scoring (Epic Scribe, 2023 dataset).
- Activation: Diagnosis triggered automatically once scoring index surpasses pre-trained cutoff.
- Compiled Rule Example:
    - Input: Patient predicted probability of cardiac failure = 0.72.
    - Rule: If score ≥ 0.70 → trigger high-risk protocol.
    - Output: Procedure authorization + insurance classification executed instantly.

C.2.2 Control Dynamics

The compiled rule functions below physician-level deliberation. Recommendations appear binding despite lacking an identifiable issuer, reinforcing non-referential authority within medical governance.

Reference: Topol (2019); Startari (2025g).

C.3 DAO Governance Architectures

DAO smart contracts illustrate the most advanced case of procedural sovereignty: once deployed, the rules cannot be contested, suspended, or bypassed.

C.3.1 Smart Contract Execution Model

- Input Layer: On-chain proposals submitted by token holders.
- Consensus Layer: Quorum and voting thresholds pre-encoded.

- Activation: Once quorum conditions are met, the compiled rule executes the outcome automatically.
- Example:
    - Input: Proposal P_023 passes quorum = 65%.
    - Rule: Smart contract executes allocation instantly.
    - Output: Treasury movement finalized, non-reversible.

C.3.2 Absence of Mediation

Unlike traditional institutions, DAO governance lacks supervisory vetoes. Authority resides fully within the syntactic infrastructure.

Reference: De Filippi & Wright (2018); Hassan & Kyriakou (2020).

C.4 Model Flow Diagrams (Conceptual)

C.4.1 Predictive Compliance Engine

```
Input (Transactional Data)
        ↓
Anomaly Detection Layer
        ↓
Risk Scoring Module
        ↓
[Regla Compilada Activation]
        ↓
Automated Enforcement + Reporting
```

C.4.2 Healthcare Triage Model

```
Input (Patient Data)
        ↓
Predictive Scoring Pipeline
        ↓
Threshold Classification
        ↓
[Regla Compilada Trigger]
        ↓
Treatment Prioritization + Insurance Response
```

C.4.3 DAO Governance Architecture

```
Proposal Submission
        ↓
Quorum Calculation
        ↓
Pre-encoded Contract Conditions
        ↓
[Smart Contract Execution]
        ↓
Non-reversible Treasury & Governance Actions
```

C.5 Structural Synthesis

Across financial, medical, and decentralized systems, four operational constants define spectral sovereignty:

1. Trigger Autonomy: Decisions are activated automatically, without institutional deliberation.
2. Opacity of Process: Regla compilada operates below interpretive thresholds.
3. Collapse of Temporality: Decision and enforcement occur simultaneously.
4. Irreversibility: Once activated, outputs cannot be revoked or contested.

These architectures formalize the disappearance of the sovereign without erasing its effects, embedding institutional authority into procedural infrastructures.

Appendix D — Implications, Risks, and Accountability Frameworks

Purpose: This appendix consolidates the institutional, ethical, and political implications of Spectral Sovereignty, focusing on the erosion of accountability, the collapse of appeal mechanisms, and the opacity of predictive infrastructures. It also proposes a structured framework for evaluating institutional transparency and designing accountability mechanisms for environments governed by reglas compiladas.

D.1 Structural Implications

D.1.1 Institutional Legitimacy Under Spectral Sovereignty

Predictive infrastructures redefine legitimacy by detaching authority from intentionality. Institutions sustain compliance through procedural enforcement rather than deliberative consent (Startari, 2025a). Legitimacy becomes infrastructural, grounded in the execution of compiled rules rather than the symbolic presence of the sovereign.

This shift alters governance at three levels:

1. Operational: Institutions execute without deciding.
2. Semantic: Meaning becomes irrelevant to enforcement mechanisms.
3. Political: Authority becomes invisible, while its effects remain binding.

D.1.2 Legal and Normative Displacement

Classical legal systems rely on traceability, human interpretation, and institutional recourse. Under spectral sovereignty, those mechanisms collapse. Predictive scoring, smart contracts, and automated compliance produce binding outputs without requiring legislative, judicial, or administrative validation (Zetzsche et al., 2020).

Consequently:

- Due Process Gaps: Subjects cannot appeal outcomes to identifiable authorities.

- Procedural Overreach: Automation enforces obligations beyond institutional intent.
- Legal Fragmentation: Regulatory frameworks lag behind the operational speeds of predictive infrastructures.

D.2 Risks in Predictive Governance

D.2.1 Crisis of Appeal

Appeal mechanisms fail because decisions are procedural rather than deliberative. In automated compliance or healthcare triage systems, enforcement occurs before institutional actors intervene (Topol, 2019). Under these conditions, authority exists but cannot be addressed.

D.2.2 Vacuum of Responsibility

Spectral sovereignty produces what Startari (2025b) terms distributed non-responsibility:

- Designers of predictive models disclaim liability, citing institutional mandates.
- Institutions delegate accountability to the "neutrality" of algorithms.
- Regulatory bodies defer responsibility to procedural enforcement logs.

The result is a systemic diffusion where no actor accepts or controls outcomes, creating governance without agency.

D.2.3 Opacity and Non-Interpretability

Predictive infrastructures depend on black-box architectures. Compiled rules are inaccessible to subjects, institutions, and sometimes even model developers. This opacity is technical, due to machine learning complexity, and political, since infrastructural opacity shields decision-making from oversight (Williamson & Piattoeva, 2022).

D.3 Accountability Index for Predictive Systems

To counteract institutional opacity, we propose an Accountability Index for Predictive Sovereignty (AIPS). The index evaluates systems across four dimensions:

Dimension	Indicator	Measurement Focus
Transparency	Procedural interpretability	Access to rule sets and triggers
Traceability	Decision provenance	Mapping inputs to outcomes
Agency	Human intervention thresholds	Control points for institutional veto
Appealability	Contestation mechanisms	Existence of effective recourse

Systems scoring below 0.5 on any dimension indicate high spectral opacity, requiring independent review.

D.4 Policy Recommendations

D.4.1 Institutional Protocols

- Mandatory documentation of compiled rules and scoring thresholds.
- Oversight bodies to perform ex-ante audits of automated decision chains.

D.4.2 Governance Transparency

- Establish open registries of smart contracts and DAO governance logs.
- Require disclosure of model architectures where decisions have legal consequences.

D.4.3 Citizen Rights Framework

- Enshrine rights to explanation for algorithmic outputs.

- Guarantee pathways for redress when predictive infrastructures generate adverse outcomes.

D.5 Structural Synthesis

Spectral sovereignty represents not the erosion of authority but its relocalization into infrastructures designed to execute without deliberation. While efficiency and scalability increase, institutional accountability diminishes. The combination of procedural opacity, collapse of appeal, and distributed non-responsibility produces a governance vacuum where legitimacy persists but representation vanishes.

This appendix establishes both the diagnosis and the framework necessary to evaluate and regulate predictive sovereignty in institutional contexts, laying the groundwork for future research on accountability architectures.