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NEWS AND DEVELOPMENTS

COGNITIVE SOVEREIGNTY IN THE AGE OF ARTIFICIAL INTELLIGENCE: CONTROL OVER THE INFRASTRUCTURES OF KNOWLEDGE AS A NEW FACTOR OF POWER

ABSTRACT: This article proposes cognitive sovereignty as a legal, economic and geopolitical category indispensable to understanding the Age of Artificial Intelligence. Its central thesis is that artificial intelligence shifts digital sovereignty toward a cognitive sovereignty, because power no longer resides in the command of data, in physical infrastructure or in computing capacity alone, but in control over the infrastructures that produce intelligence. Starting from the transition from a data economy to an intelligence economy – anticipated by the notion of surveillance capitalism – the article examines the concentration of cognitive infrastructures (compute, semiconductors, cloud and foundation models), the regulatory paradox whereby legitimate governance rules may entrench incumbents, and the problem of auditability, transparency and what is here termed the right to comprehension. It then discusses the effects on democracy, markets and the State, proposing a normative agenda capable of reconciling innovation, competition and institutional autonomy. The text engages with the literature on the digital economy, regulation and theory of the

Keywords: Cognitive sovereignty. Artificial intelligence. Cognitive infrastructure. Surveillance capitalism. Concentration of power. Algorithmic governance. Auditability. Regulation. Competition. Right to comprehension.

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Introduction

Every historical order has organized itself around a dominant factor of power. Land structured agrarian societies; machines and coal, the industrial economy; energy, finance and information, the geopolitics of the twentieth century. The twenty-first century introduces a rupture of a different nature: the decisive strategic asset is no longer information, but intelligence – understood as the capacity to produce inferences, syntheses and decisions at scale. Whoever commands the means of producing intelligence occupies today the position once held by those who controlled land, industry or financial capital.

The thesis of this article can be stated in a single sentence: artificial intelligence shifts digital sovereignty toward a cognitive sovereignty, because real power comes to reside in control over the infrastructures that produce intelligence. This is not a metaphor, but a verifiable change in the material structure of the economy and, consequently, in the distribution of authority among States, corporations and institutions.

The prevailing legal debate still revolves around data protection, privacy and the control of algorithms. These are legitimate and necessary agendas, yet insufficient, for they assume that the essential problem is the collection of information, when the decisive problem is already a different one: who holds the capacity to transform information into intelligence, according to which

To sustain this argument, the text proceeds through nine movements: the birth of the Digital Age and the mutation of power; the transition from the data economy to the intelligence economy; surveillance capitalism as the antechamber of that turn; the concentration of cognitive infrastructures; cognitive sovereignty as a legal category; the regulatory paradox; auditability and the right to comprehension; the effects on democracy, markets and the State; and, finally, a normative agenda. The guiding thread is the conviction that new legal categories become necessary when the old ones cease to describe the reality they purport to govern.

1 The Birth of the Digital Age and the Transformation of the Nature of Power

Digitalization is usually narrated as a mere succession of technical innovations. That description is impoverished. What electricity did for industry and the railways did for the circulation of goods, digital infrastructure did for information: it turned information into a universal input and, in doing so, reorganized the architecture of power. Manuel Castells had already shown that the network society does not merely accelerate exchange but redefines where authority is located – in the nodes that concentrate connectivity and processing capacity.

Conceived as a calculating machine, the computer became, with the internet, cloud computing and mobility, the substrate of nearly all economic activity. The philosophy of technology offers a deeper key to interpretation. For Heidegger, modern technology is not a set of tools but a mode of revealing the world that reduces everything to a standing reserve available for use – what he called *Gestell*, enframing. Jacques Ellul and Lewis Mumford warned, by different routes, that technical systems tend to impose their own logic upon the institutions meant to govern them, and Gilbert Simondon insisted that to understand technology is the condition for not being subjected to it. Digitalization is the contemporary form of this process: it organizes experience according to patterns that largely escape the control of those who live it.

In the first decades of the digital economy, the center of gravity was data. Firms competed for the capacity to collect, store and correlate records of

Srnicek analyzed under the heading of platform capitalism – business models whose raw material is human experience converted into data, and data converted into prediction. The singularity of the present moment lies in the fact that this raw material has at last found an industry capable of refining it into something of higher value: intelligence.

2 From the Data Economy to the Intelligence Economy

For years it was repeated that data would be the new oil. The image had didactic merit and an analytical limit. Oil is a raw material and is worth something only once refined; data occupy an identical position, for in isolation they mean little and become decisive only when organized, interpreted and converted into actionable knowledge. The stage that performs this conversion – and that captures most of the value – is intelligence. The data economy thus gives way to an intelligence economy.

The great foundation models are the infrastructure of this stage. They do not merely store: they relate knowledge dispersed across millions of documents, synthesize arguments, recognize patterns imperceptible to the human eye, formulate hypotheses and assist decisions. Daron Acemoglu and Simon Johnson recall, in the register of political economy, that the direction of technical progress is not neutral and depends on institutional choices about who appropriates the gains in productivity. Kai-Fu Lee, observing the Sino-American race, shows that competitive advantage has migrated from access to data toward the quality of the model and the scale of computation.

The figures give the measure of the shift. According to the 2026 Stanford AI Index, private investment in artificial intelligence reached roughly US$ 285.9 billion in the United States in 2025, approximately twenty-three times China's US$ 12.4 billion, with California alone accounting for more than three quarters of the U.S. total – although private data understate the Chinese effort, channeled through state guidance funds. Diffusion was the fastest ever recorded: generative artificial intelligence reached more than half of the world's population within three years, a pace exceeding that of the personal computer and of the internet. Productivity no longer grows merely through the automation of physical tasks but through the expansion of the cognitive

3 Surveillance Capitalism and the Cognitive Turn

Understanding the intelligence economy requires revisiting its antechamber. Surveillance capitalism, in Zuboff's formulation, is not content to know preferences: it aspires to predict and, ultimately, to modulate conduct, extracting from human experience a surplus that feeds prediction markets. Julie Cohen showed how law itself was reshaped to accommodate this informational logic, and Frank Pasquale, in his analysis of the black-box society, denounced the opacity of systems that decide on credit, reputation and opportunity without accountability.

The cognitive turn radicalizes the picture. Whereas the surveillance economy captured data in order to sell predictions, the intelligence economy internalizes the very act of producing knowledge. Yochai Benkler had celebrated the promise of a social production of knowledge, distributed and collaborative; Lawrence Lessig had warned that code is law – that is, that technical architecture regulates conduct with force comparable to that of legal norms. The synthesis of these diagnoses is uncomfortable: knowledge continues to be produced socially – through billions of texts, images, decisions and inquiries – but the intelligence built upon that common patrimony becomes private infrastructure. Luciano Floridi describes the infosphere as the environment we have come to inhabit; it remains to be seen who designs it and who administers it.

4 The Concentration of Cognitive Infrastructures

Intelligence, as a factor of production, rests upon an extraordinarily concentrated material base. This base – which may be termed cognitive infrastructure – brings together computing capacity, advanced semiconductors, energy, cloud, training datasets and foundation models. In each of these layers, concentration is the rule, not the exception.

At the level of semiconductors, Taiwan accounts for roughly 92% of the world's leading-edge logic capacity, and TSMC alone for approximately 70% of global foundry revenue and for nearly all of the chips that train and operate the large

quarters of global GPU capacity. In the cloud, three providers – Amazon, Microsoft and Google – control approximately two thirds of the world market, with switching costs that lock in most corporate workloads. At the model layer, the United States produced fifty of the notable systems of 2025, and China thirty; more than ninety percent of those models came from private companies.

The concentration is not accidental. It results from network effects and increasing returns to scale long studied by the economics of competition. Jean Tirole demonstrated how platform markets tend toward the dominance of a few; Lina Khan and Tim Wu argued that the classical antitrust categories, centered on consumer price, capture poorly the power of the digital giants; Luigi Zingales warned of the capture of the political process itself by incumbents. The cycle is cumulative: more users generate more data and more revenue; more revenue finances more computation and better models; better models attract more users. Schumpeter saw in creative destruction the engine of capitalist renewal; the intelligence economy risks producing its opposite – a destruction that, instead of opening space for new entrants, seals acquired positions.

Hence the leap from economic concentration to cognitive concentration, and from the latter to geopolitics. Joseph Nye taught that power is also exercised through attraction and through control of infrastructures; Henry Kissinger and Graham Allison foresaw artificial intelligence as an axis of competition among great powers; Ian Bremmer described the rise of technology companies to the condition of actors of quasi-sovereign stature. International rivalry ceases to turn solely on territory, energy and industry and comes to encompass research centers, supercomputers, semiconductors and the talent capable of designing them – talent whose mobility, the same Stanford AI Index records, has itself become a strategic variable, with a sharp decline in the pull of any single pole for researchers.

5 Cognitive Sovereignty as a Legal Category

Sovereignty has always been redefined in step with the material transformations of power. In Bodin, it was supreme power over a territory; in

digital economy, more recently, spoke of digital sovereignty and data sovereignty. Artificial intelligence imposes a further shift: the object of sovereignty ceases to be technological infrastructure in general and becomes, specifically, the infrastructure that produces intelligence.

By cognitive sovereignty is meant the capacity of individuals, organizations and States to preserve autonomy over the mechanisms of production, use, auditing and evolution of artificial intelligence. The definition is deliberately institutional, not autarkic. It does not postulate self-sufficiency – no State produces on its own all the technology it needs – nor does it reject international cooperation, on which innovation itself has always depended. What it asserts is the need to retain autonomy sufficient to prevent a permanent structural dependence.

The distinction is legal before it is technical. A society may use foreign technology and still remain sovereign, provided it retains the capacity to understand, audit, adapt and, if necessary, replace the systems on which it depends. It loses cognitive sovereignty when that capacity is extinguished and decision-making – in health, justice, defense, finance or public administration – comes to rest upon infrastructures whose governance is inaccessible to it. Technological dependence then becomes decisional dependence, and the question migrates from the field of industrial policy to that of public law.

Artificial intelligence is today a transversal infrastructure, for it cuts across education, industry, finance, defense, justice and science at once. Hannah Arendt defined power as the human faculty to act in concert, and its corruption as the substitution of plural action by imposition. When the capacity to decide is concentrated in a few centers that design the intelligence of all, the risk is not only economic: it is the erosion of the plurality that sustains public life. From this angle, cognitive sovereignty is a condition of institutional freedom, not a banner of closure.

6 The Regulatory Paradox

No technology of comparable impact dispenses with regulation. The risks of artificial intelligence – algorithmic discrimination, disinformation,

history of regulation: rules conceived to protect society may, without that being the intention, entrench the very actors they purport to discipline.

The mechanism is the economics of compliance. The more sophisticated the requirements of auditing, certification, documentation, compliance and cybersecurity, the higher the fixed costs of entry. Established firms absorb them; startups, universities and independent laboratories do not. George Stigler described, more than fifty years ago, the capture of the regulator by the regulated; artificial intelligence offers a contemporary illustration of it. The effect tends to be the raising of entry barriers and the reinforcement of incumbents – a concentration that, bearing on the production of intelligence, is also cognitive concentration.

The normative landscape aggravates the problem through fragmentation. The European Union adopted, in the AI Act – in force since August 2024 and applied progressively in the following years – a risk-based approach; the Council of Europe opened for signature, in September 2024, the Framework Convention on Artificial Intelligence, the first legally binding international treaty on the matter, whose first anniversary was marked at a conference hosted by the Complutense University of Madrid. In the opposite direction, the United States revoked, in January 2025, the executive order that structured the federal governance of AI, replacing it with deregulatory guidelines oriented toward technological leadership. The Stanford AI Index records that, among the forty-seven countries with AI legislation in force, only twelve possess effective enforcement mechanisms, and that compliance costs vary by as much as eightfold across jurisdictions. The picture is one of discoordination, not convergence.

To this is added public distrust. Still according to the same survey, only 31% of U.S. citizens trust their own government to regulate artificial intelligence, against a global average of 54%, and the gulf between experts and the public regarding the effects on employment is abyssal. Regulation without legitimacy and without enforcement capacity does not reduce risk: it merely redistributes advantage. The challenge lies not in choosing between regulating and

7 Auditability, Transparency and the Right to Comprehension

If concentration is the structural problem, opacity is its aggravating factor. Foundation models operate as architectures of extreme complexity, and the recent tendency is toward less, not greater, transparency: of the ninety-five significant models released in 2025, eighty were made available without their training code. Cathy O'Neil showed how opaque models can institutionalize discrimination under the appearance of objectivity; Frank Pasquale insisted that the black box is incompatible with the accountability required of those who exercise power.

From this emerges what may be called the right to comprehension – a category that I had the opportunity to introduce and systematize in Brazilian legal scholarship in a study devoted specifically to the subject, published in the Revista dos Tribunais (vol. 1077, 2025). I argued, in that work, that the right to comprehension constitutes an evolution of the constitutional principles of publicity, transparency and the duty to give reasons: the decisions of public authorities must not only be public and transparent, for they must be comprehensible, rational and coherent – no one comprehends an arbitrary act. More than that, the right to comprehension is there built upon an infrastructure of structured legal databases, statistics and auditable artificial intelligence, capable of rendering public justification traceable, comparable and verifiable. In comparative terms, Sandra Wachter and Brent Mittelstadt discussed the scope and limits of a right to explanation in the face of automated decisions; Daniel Solove reconstructed privacy as a question of informational power, and not of mere secrecy; Cass Sunstein examined how choice architectures shape conduct without the subject perceiving it. The right to comprehension does not require that every citizen master the mathematics of the models; it requires that there be institutions – public and independent – capable of auditing them on behalf of all.

The technical-normative framework for this is already beginning to take shape. The NIST AI Risk Management Framework of 2023 offers a grammar of risk management; the ISO/IEC 42001 and 23894 standards govern AI management and risk-treatment systems, alongside the information-security tradition of

parameters of trustworthy AI. What is lacking is not vocabulary, but the institutionalization of auditability as a condition of validity, rather than a mere recommendation.

8 Democracy, Markets and the State

The consequences of cognitive concentration extend beyond the economy. For centuries, knowledge was produced in a relatively distributed manner: universities published, books circulated, patents expired, discoveries entered the common patrimony. Artificial intelligence keeps the production of knowledge collective but privatizes the intelligence extracted from it. Bernard Stiegler and Byung-Chul Han, in distinct keys, warned of the risk of a proletarianization of the mind – the loss, by the individual, of his very capacity to know and to decide – when cognition is delegated to systems he does not control.

Constitutional democracy learned to distrust concentrations of power. It limited political power through the separation of functions and disciplined economic power through competition law. Artificial intelligence introduces a third dimension – cognitive power – which does not replace the former two but amplifies them. Whoever controls intelligence enlarges economic influence; economic influence converts into political capacity; political capacity favors technological expansion. The circle, if not institutionally interrupted, tends to close.

The State, too, is transformed. Historically, it fell to the State to produce the norm; to the market, wealth; to the university, knowledge. These frontiers blur when private firms develop scientific capacities comparable to those of the foremost academic centers, supply models to governments and take part in defining the very standards meant to discipline them. Anne-Marie Slaughter described a world of networks that cut across the divide between public and private; the challenge is to ensure that such networks remain subject to democratic scrutiny.

None of this warrants pessimism. Artificial intelligence is, in all likelihood, the greatest lever of productivity and of scientific progress of our era: it

technologies generate more consistent development when accompanied by institutions equal to them. The problem is not the technology, but the absence of institutions capable of distributing its benefits.

9 Conclusion: Toward a Normative Agenda for Cognitive Sovereignty

Cognitive sovereignty is neither nationalist nostalgia nor a rejection of international cooperation. It is the recognition that, when intelligence becomes essential infrastructure, preserving autonomy over the mechanisms that produce it ceases to be a technological strategy and becomes a condition of the very autonomy of democracies, of markets and of the rule of law.

A normative agenda equal to the problem may be organized around a few axes, without any claim to exhaust them. The first is a proportionate regulation that modulates requirements according to risk and materiality, containing harm without erecting barriers that only incumbents can surmount. The second is the institutionalization of auditability, with public and independent bodies endowed with the technical competence to inspect high-impact models, after the manner in which the law has already done with financial auditing and supervision. The third is the guarantee of interoperability and technological pluralism, as competition law did, in other eras, with telecommunications networks. The fourth is sustained public investment in computing capacity, the training of researchers and open research, without which autonomy is no more than rhetoric. The fifth is international cooperation grounded in rights – of which the Council of Europe's Framework Convention is the first binding example – capable of averting both the regulatory vacuum and the race to the bottom.

The thread that unites these axes is the refusal of a false alternative. It is not a matter of choosing between innovation and control, between market and State, between openness and sovereignty, but of building the institutions that render these values compatible. Artificial intelligence has shifted the center of power toward control over the infrastructures that produce intelligence; it falls to the law to ensure that this power remains distributed, auditable and accountable. Cognitive sovereignty is the name of that task – and, perhaps, one of the categories indispensable if the Age of Artificial Intelligence is to

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