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The Technological Paradigm Shift in International Transnational and European Union Law

Introduction: Technology and the Hybridization of Law[1]

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Ladies and Gentlemen,
Distinguished Colleagues,

The contemporary legal order is undergoing profound, far-reaching transformations. These changes can be understood along three classical dimensions that have traditionally structured legal systems: first, international relations; second, institutional dynamics within domestic legal orders; and third, legal relationships among individuals and between individuals and both public and private authorities.

These developments share two defining features. First, they are not merely transitional phases, nor do they stem from top-down legislative or institutional decisions imposed by states or international organizations. Instead, they arise from social, economic, and technological practices and operate as forces of structural disruption. In doing so, they have unsettled markets, institutions, principles, and both international and domestic legal norms that, since the post–Second World War era, have

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formed the foundation of peace, stability, and progress. These dynamics no longer affect only institutions and markets; they now reach into interpersonal legal relationships themselves.

Second, these transformations generate processes of hybridization across international, transnational, and national regulatory levels, making the boundaries between these normative spheres increasingly porous and difficult to define.

From a structural—or, as Kingsbury would say, infrastructural—perspective, a common explanatory factor can be identified in technological progress. Technological innovation has triggered a further industrial revolution that, until recently, belonged more to fiction than to empirical legal or economic analysis. The capacity to anticipate and exploit technological developments generates significant asymmetries. As a result, the technological race—often described as a *techno-rush*—no longer involves only private economic actors but increasingly engages States and public authorities as well.

Within this context, public and private power undergo processes of functional convergence and mutual interdependence. The distinction between public authority and private economic power becomes blurred, as the two increasingly overlap, interpenetrate, and operate either in competition or in coordination in pursuit of convergent objectives.

Technology thus functions as a structural medium through which, on the one hand, States reinterpret and rearticulate their role within international law, and, on the other hand, transnational corporations exercise forms of authority that transcend the traditional boundaries of private autonomy. Through these dynamics, fundamental legal principles and rights are recalibrated; the boundaries of economic democracy are redrawn; and the very concept of the rule of law—together with the foundational elements of the constitutional State, the

Rechtsstaat—is progressively redefined. At the same time, individuals acquire enhanced capacities and new legally relevant attributes through technological mediation, while simultaneously being subjected to novel forms of influence in both interpersonal relations and interactions with institutional actors.

Technology, in substantive terms, is not an end. Rather, it constitutes the enabling precondition for the emergence of a new social function in the exercise of public authority and private autonomy. It gives rise to new forms of hybridization within international relations (*Hyb-Global*), domestic legal orders (*Hyb-National*), and interindividual relations (*Hyb-Human*).

These three levels of hybridization tend to overlap because of the partial coincidence: (1) of actors—States and enterprises, enterprises and individuals— (2) of applicable normative frameworks—international, transnational, European Union, and domestic law—and (3) of functional objectives, such as general welfare, social utility, and national security in its military, economic, and even democratic dimensions. This convergence requires, on the one hand, flexibility in the use of traditional legal tools, and, on the other, the capacity to devise new instruments capable of capturing ongoing transformations. Such instruments are essential to interpret the living law and the emerging legal language that contributes to its formation.

Allow me to begin with the first level: international relations.

Here, accountability in global governance, as emphasized by Benvenisti, and technological development operate as communicating vessels. Multilateralism is increasingly reduced to confrontation among spheres of economic and political influence—primarily those of the United States, the European Union, China, and Russia—each pursuing different, and at times divergent, paths. The only conceivable alternative, though

difficult to realize and currently confined largely to trade, appears to be what has been termed a WTO-minus-one: a multilateral system that formally persists despite U.S. isolationism, coupled with unprecedented regulatory convergence between the European Union and China.

If we organize institutions and markets in matrix form, we observe that the United States benefits from a vast internal market and is defining a minimal regulatory framework aimed at enabling technology not only to innovate, but also to scale and consolidate. Conversely, the European Union must integrate twenty-seven national markets and is now called upon to simplify a regulatory architecture that, while not suppressing innovation, unquestionably conditions its development. China combines an extensive domestic market with the selective incorporation of European general norms deemed functionally necessary.

The United States and the European Union are thus following different paths—shaped by their respective structural needs—toward a position that China has already reached. Yet the path itself may matter more than the endpoint. While the United States continues its tradition of minimal market intervention and the instrumentalization of private enterprises for public purposes—such as reinforcing the primacy of the dollar—the European Union and China pursue market-regulation strategies grounded in distinct but internally coherent models. This convergence illustrates both the effectiveness of the "Brussels effect," as theorized by Bradford, and the fact that the European regulatory model functions independently of the democratic nature of the adopting State. It may serve to uphold the rule of law—reconceptualized less as separation of powers and more as guarantee of enforcement—or, through the same logic of enforcement, to enable intensified control by monopolistic political power.

Digital sovereignty coincides with public sovereignty (Xi Jinping). However, digital sovereignty may be exercised by either public or private actors, whereas political sovereignty remains inherently public, though it is not necessarily democratic.
This outcome is unsettling, yet not unexpected. Technology itself is neutral; its uses are never neutral. Uniformity of enforcement—or sanction, in Kelsenian terms—or, alternatively, effectiveness—which in international law coincides with existence—has long been the glue of international and transnational law. What is new is that this logic now extends to domestic legal orders as well. Consequently, international and transnational law, together with their systems of sources, become pivotal, and it is their interpretative and applicative tools that now require revision.
The question we must address is how to ensure that technology is made instrumental to the pursuit of peace externally and to the promotion of democracy internally.

If enforcement replaces effectiveness and becomes the cornerstone of the rule of law or of the *Rechtsstaat*, displacing the classical separation of powers—whose legislative-executive dimension has largely become obsolete—it follows that the parameters of governmental legitimacy seem to be transformed. With them, the scope of the *domaine réservé*, including human rights protection, would be recalibrated. Sovereignty and democracy themselves, along with the instruments safeguarding them, require conceptual rethinking.

States and enterprises compete within international relations, because: public authorities intervene in markets; private actors participate in norm-production; States transform enterprises into agents of public policy; or even transfer to them symbols of authority, as in the case of digital currencies. Thus, the analytical criteria separating international and transnational law must be reconsidered. Jessup's classical definition of transnational law as residual seems to be no longer adequate. Rather, transnational

law could be the pivot of an unprecedented hybridization between State and market. The case of Meta is emblematic: by adopting an internal “Charter” and referring to international law through a non-incorporative clause, the company effectively constitutes a private legal order.
However, this competition appears to be balanced in a troubling way: as national governments become more fragmented and multilateral agreements lose influence, power is increasingly concentrated in the hands of transnational corporations. Over the medium term, this shift has significant implications for the global balance of power—particularly given that private companies are not driven by public interest or by a commitment to safeguarding democratic institutions.

Peace itself has assumed a hybrid character. Europe currently experiences a condition of latent, undeclared conflict extending beyond territorial incursions to cyber operations. Legal instruments of armed conflict—beginning with humanitarian law—remain largely inapplicable. Consequently, our conceptual frameworks of “global risk” require urgent updating.

This condition legitimizes narratives of rearmament, within which parts of Europe’s technological industrial reconversion are redirected. Such rearmament, however, risks proceeding asymmetrically, with Germany assuming a dominant role, thereby generating systemic tensions within the Union.

Security within the living law is correspondingly transformed, encompassing military, economic, and democratic dimensions. This enables certain States to justify derogations from international, transnational, and EU law, both internally and externally (Arangio-Ruiz). Internally, Europe has expanded instruments protecting national interests, including economic and democratic ones. Externally, the notion of “hybrid threat” is invoked to legitimize preventive defense strategies, extending even to criminal law’s extraterritorial application.

The so-called Donroe Doctrine extends far beyond Monroe (defensive strategy) and Roosevelt (corollary: right of intervention). Unlike earlier doctrines, it lacks a principled democratic foundation, opening the door to arbitrariness. Hybrid threats justify hybrid responses, from "special operations" (Ukraine, Venezuela now, Greenland or Taiwan soon) to extraterritorial criminal enforcement, subordinating sovereignty to national security imperatives.

Yet technology also provides new instruments for the construction and preservation of peace—an aspect still insufficiently explored.

Economically, we are not witnessing mere "regionalization of globalization", but rather a multilateralism composed of harmonized agreements among States and regional organizations, resembling patterns long present in international investment law (Sacerdoti).

The fracture of the global order requires renewed assessment of relations among "power-States" (Arangio-Ruiz). What is new is that power can no longer be measured solely by military or traditional economic capacity. Instead, it emerges from a matrix of (a) armaments, (b) raw materials—both traditional (coal, oil) and rare earths—and (c) technology, whose development depends on access to both.

Applying this matrix to Security Council veto holders reveals deep asymmetries. The United States excels in military and technology but depends on external raw materials. China controls rare earths -Greenland aside- and advanced technology but lacks autonomy and military projection (maintaining only two overseas military bases compared to approximately 800 operated by the United States). Russia possesses all three elements, but insufficient scale. The European Union lacks

military autonomy, rare earths, and technological sovereignty—a consequence of the unfinished federal project (Amato).

In such a framework—characterized by “power-States” or competitive fragmentation (Scheidel)—global organizations lose relevance, while regional bodies adopt market-oriented models serving State interests without safeguarding sovereignty, the Shanghai Cooperation Organization being an example.

If technology is the constitutive factor of contemporary transformation, its impact must be assessed across institutions, norms, legal orders, and sources of law. Technology enables change; it does not govern it. That responsibility lies with legal scholarship and institutions, through critical reassessment of assumptions no longer compatible with present realities.

Numerous examples illustrate these dynamics.

Private enterprises now issue currencies—stablecoins—reinforcing the dollar without inflationary costs and expanding demand for U.S. sovereign debt.

Digital platforms have evolved into private legal orders exercising legislative, executive, and adjudicative functions, negotiating norms *inter pares*. In 2025, trade negotiations between the U.S. and the EU explicitly linked tariffs to regulatory constraints on platforms—another manifestation of hybridization.

Markets themselves have become hybrid. Sectorial ‘vertical’ silos (banking, insurance, financial, communications, and energy markets) dissolve; horizontal regimes (governing competition, data protection, and consumer protection) evolve as well.

Norms crystallize from market practices into standards and - through nudging (Sunstein) - binding rules, according to the regulatory circle (Bassan) increasingly shaped by participatory

regulation, involving public authorities and market actors (hybridization, again).

Corporate risk management now encompasses entire value chains, informed by social and solidaristic functions (as under EU DORA Regulation) sustainability goals, and technological infrastructure (EU NIS2 Regulation), while States deploy defensive tools—golden powers—across economic and democratic domains, empowering public authorities to authorize, condition, or prohibit acquisitions of enterprises or technologies deemed to threaten national security in its military, technological, economic, financial, and, ultimately, democratic dimensions

Blockchain democratizes processes while transforming intermediation, as only intermediaries that generate value stay in the chain.

Artificial intelligence, whether autonomous (as agent) or assistive (as co-pilot), enhances human capabilities and reshapes labor, investment, and social relations.

Technology increases transparency, yet also enables electoral manipulation by private actors, eroding sovereignty and the *domaine réservé*. National and international courts have declared elections unlawful where electoral outcomes have been determined by the direct or indirect intervention of transnational corporations that distort information flows and thereby influence voters' will (most recently, Hungary). Once again, this reveals a process of hybridization between public and private law, and between subjects of international law (States) and transnational law (corporations), operating both within international relations and domestic political processes.
At the same time, politics has shifted onto social media, losing its participatory dimension (Amato) and becoming increasingly

polarized (Sunstein), once again shaped by manipulation carried out by transnational corporations.

Fundamental rights thus become central normative anchors in an era of technological and power reconfiguration, featured by technological revolution and by the reconfiguration of relations among "powers" (States and multinational enterprises; public and private legal orders).

Scientific and technological innovation raises questions concerning rights and freedoms that are addressed at constitutional and supranational, European, transnational, and international levels. Within this multi-layered framework, the role of courts becomes pivotal, as does the way courts themselves deploy technology (Custers). Digitalization reshapes freedom of expression, data protection, identity, and self-determination, demanding renewed focus on enforcement.

Welfare digitalization intensifies social surveillance (Sciarrone-Rabitti), balancing inclusion and control in different ways across the prevailing and often competing spheres of influence of the European Union, the United States, and China (Gao). In this domain, national laws, supranational norms—beginning with those of the European Union—and international treaties once again form a matrix characterized by rigidity at the level of principles and a corresponding flexibility in the determination and application of rules.

Cyber threats drive international legal standards, addressing cyberattacks, espionage, and cyber warfare, with the dual objective of protecting national security in inter-State relations (externally) and safeguarding public and private legal orders, as well as citizens' privacy, internally. Surveillance capitalism (Zuboff) challenges data protection.

Technological development has also made possible direct competition between private enterprises and governments in the exploration of outer space—not only for scientific and commercial purposes, but potentially for resource extraction and even forms of planetary colonization—as well as in the exploration and exploitation of terrestrial resources. Here again, we observe processes of hybridization and interpenetration between States and enterprises, between public and private forms of engagement, between commerce and the protection of rights—extending beyond human rights alone to encompass broader collective and systemic interests.

Technology has further enabled the articulation of the "One Health" paradigm, which has gained renewed momentum in the aftermath of the COVID-19 pandemic (Scotti). Within this framework, development can no longer be understood as merely sustainable—concerned with safeguarding the well-being of future generations—but must also be harmonious, integrating human and non-human dimensions. The environment thus emerges not simply as an object of protection or conservation, but as a constitutive element of a complex system linking human health, animal health, and ecosystem integrity. It becomes, accordingly, a necessary component in addressing global challenges such as pandemics, climate change, and food security. As a result, the very definitions and legal instruments relating to sustainable development, climate change—including the evolving notion of climate justice at the transnational and increasingly international level (Foster)—and marine protection are themselves reshaped within this broader conceptual framework.

The implementation of quantum technologies likewise calls for regulatory and institutional responses informed by a medium- to long-term perspective, coupled with openness to technological discontinuities capable of profoundly transforming everyday life. In this field, markets remain structurally open, both to new

entrants and to further technological and organizational innovation, reinforcing the need for anticipatory governance rather than reactive regulation.

Taken together, these examples—necessarily selective—illustrate the transformations that define what may be described as a "hybrid era." In this era, human intelligence increasingly operates in conjunction with technological and machine intelligence, enhancing not only computational capacity but also cognitive, organizational, and decision-making capabilities. At the same time, transnational enterprises and States, ever more directly in competition with one another, continuously adapt their respective instruments of action, intervention, and governance.

Technology thus makes it possible to conceptualize a new architecture of international relations—one that encompasses not only States and international organizations, but also transnational enterprises as structurally relevant actors. It also enables new modes for the exercise and protection of individual and collective rights within both international organizations and domestic legal orders. These developments are embedded in an evolving understanding of the rule of law and of the *Rechtsstaat*, grounded on premises that differ significantly from those consolidated in the post–Second World War period. At the same time, technology facilitates new forms of interpersonal relations that have already entered, with remarkable speed, both collective imagination and daily social practice.

The international, transnational, national, and individual levels are now interconnected through technology, which transforms, overlaps, and blurs them. The "permanent technological revolution" that characterizes the third millennium is therefore not merely a driver of incremental change; it represents a genuine turning point—a game changer—against which established legal categories and the instruments of economic

analysis developed thus far must be tested and, where necessary, fundamentally revised.

Against this background, the contributors to these two days of discussion are invited to engage directly with this evolving reality: to describe and interpret it by treating technology as the primary vector of change; to propose definitions, instruments, infrastructures, and governance arrangements capable of being shared—or at least rendered mutually intelligible; and to identify points of convergence, or at a minimum meaningful interconnection, among different perspectives.
Such efforts may offer a common foundation from which to rethink multilateral development in international and transnational relations and to envisage a renewed social compact within domestic legal orders.

Thank you.

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