

Social Metamorphosis and Normative Autopoiesis: Beyond the Realm of Private Law

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Abstract

The essay examines the normative transformation of private law in a technological age permeated by novel regulatory arrangements that emerge beyond the traditional frameworks of state-centred normativity, with particular attention to prospective developments. Normative evolution unfolds through processes of regulatory autopoiesis within transnational socio-technical networks, giving rise to forms of private normativity produced by the interaction of economic interests, technical standards, computational protocols and organizational practices. The erosion of the centrality of codified law - undermined by globalisation processes - gives way to the functional primacy of distributed networks operating according to a logic that privileges systemic functionality over normative reflexivity. The liquefaction of law materialises in the disintegration of the boundary between norm and fact, prescription and description, shifting towards predictive modelling and algorithmic correlation, whereby legal norms are transformed into probabilistic thresholds, dynamic parameters and continuously redefined risk criteria.

Keywords: socio-technical networks; legal autopoiesis; risk pool; transnational law; new private law

INTRODUCTION

The liquefaction of law, as theorized by leading scholars several decades ago, has materialized and taken the shape of a multi-headed hydra, in which each head represents an autonomous node. Any inquiry into normative evolution and its possible trajectories cannot disregard the phenomenon of globalization, which simultaneously absorbs and dismantles established legal structures. Never have the words of Pietro Perlingieri been more apposite, when he defined law as an applied practice, referring to the “practices” developed by individual Italian courts. Within systems theory and the study of social networks, it is no longer provocative to speak of a law of private actors (Teubner, 2019) “created by them and operating in full autonomy”, instead of the one of the state. At this point, transformation and dissolution converge. Technology comes to prevail through the stabilization of plurilateral consensus among technical operators, while technicised custom is elevated to a rule of conduct and an “*applied*

practice” within global and transnational socio-technical networks, where the autopoiesis of law manifests itself. The non-state derivation of normativity would not, in itself, constitute a detriment, provided that it were contained within a clearly defined normative framework capable of setting its pace; however, the absence of guiding principles governing contractual freedom and private autonomy gives rise to systemic anarchy a system destined to become something else (Rodotà, 2008). The transformation of the legal world as we know it is already manifestly underway, and few remedies appear capable of restraining or containing its advance. The advent of new technologies, such as artificial intelligence, has contributed to accelerating a phenomenon already embedded within the normative and regulatory fabric of both the Western and Eastern blocs (Perlingieri, 2005). Much like a latent disease that suddenly accelerates upon the occurrence of a triggering event, the widespread dissemination of new technological innovations has acted as a catalyst for the dissolution of the traditional normative fabric. At multiple levels, and continuing to this day, attempts have been made both nationally and at the European level to adapt classical legal categories to emerging technological and social phenomena. In the author’s view, such efforts have often resulted in awkward and ineffective solutions, producing more harm than remedy. Ultimately, the question is whether it is necessary to forge new legal norms in the hope of intercepting technological advancement, or whether it would be more appropriate to move towards a renewed social philosophy and to rethink society and the relationships among its members. Life has increasingly come to be understood, as Harari observes, as a process of data processing, while technology, appropriating the outcomes of scientific knowledge without rendering them beneficial to all, relocates such outcomes to particularized spheres, thereby generating processes of exclusion. The social product that sets technique against knowledge is profoundly disruptive: a mystified and artificial reality sacrifices members of the polity on the altar of discrimination. The notion of blind machinic impartiality detaches itself from the capacity for cooperation that enables social models of coexistence to remain flexible, extending beyond the ethical and legal dimension. The need for law is revealed in the interplay between freedom and reason, between *logos* and *chaos* - that is, in the human tendency to impose rational organisation upon complexity, thereby creating an effective instrument of social sustainability. The intersection of information (+logos) and indeterminacy (+chaos) in which greater information, which we call reason, and indeterminacy, which we call freedom, coexist - constitutes the human being, capable of both good and evil, and consequently in search of a point of equilibrium that we call justice, the elaboration of which we term law¹. Thus, equilibrium evokes the concept of justice, at the core of which lies the social dimension - “*the social economy*” - framed within the coexistence of individual and collective interests. There can be no justice, nor a just outcome, if it does not emerge from a complex relational process that establishes communication among the many parts of the whole².

¹ V. MANCUSO, Sulla giustizia e sulla natura del mondo, in Lezioni magistrali del corso di giurisprudenza dell’Università della Calabria, Calabria, 2018-2019, ed. by E. Caterini, Pisa, 2020, p. 95.

² A popular tale is instructive on this point. A camel driver bequeathed 11 camels to his three sons. His will provided that the first son should receive $\frac{1}{2}$, the second $\frac{1}{3}$, and the third one-sixth. Since the inheritance consisted of indivisible assets and the estate could not be apportioned into whole units among the three heirs, an irreconcilable dispute arose between the brothers. A fellow camel driver, a friend of the deceased, in order to prevent the conflict from damaging personal relations, contributed a twelfth camel *pro bono pacis* and proposed that the testamentary dispositions be applied to twelve camels rather than eleven. At this point, the first heir received six, the second three, and the third two, for a total of eleven camels. Once all heirs had been satisfied, the friend reclaimed his camel, which had been lent solely to resolve the dispute. While proportionality, in the abstract, might have been just, it would have produced an unreasonable result, unsatisfactory from multiple perspectives. The solidaristic spirit of the deceased’s friend rendered justice truly just. The tale

METHOD

This article adopts a theoretical and doctrinal research design, developed through an interdisciplinary dialogue between private law theory, systems theory, and socio-technical studies. The research starts from a gap in the existing scholarship: while much of the literature has examined digital regulation, platform governance, and algorithmic decision-making as separate phenomena, less attention has been paid to how these developments jointly transform the conceptual foundations of private law, especially in relation to norm production, responsibility, and the governance of risk beyond the state. Against this background, the article addresses a precise question: how should private law interpret and respond to regulatory forms that emerge within transnational socio-technical networks and that operate through technical standards, computational protocols, and organisational practices rather than through traditional state legislation alone? Methodologically, the paper proceeds by conceptual reconstruction and critical analysis. It maps the transition from classical legal categories to socio-technical ones, examines the crisis of causation and individual liability in complex networked environments, and interprets these transformations through the concepts of legal autopoiesis, collective risk allocation, and hybrid governance. The article therefore does not offer an empirical case study, but a systematic theoretical framework intended to explain what existing approaches do not fully clarify: namely, how private law is being reconfigured from a system centred on rules and adjudication into an environment increasingly shaped by infrastructure, automation, and privately generated normativity.

THE EVOLUTION OF LAW: PERSISTENCE AND THE NEW SUPERSTITION

Modern law, as it has evolved to the present day, is permeated by normative artefacts which, on the one hand, have acted as a driving force of its development, yet on the other hand may be regarded as the gates of a prison - a *prison of legal reasoning*. The trial of the rats of Autun³ in 1522 provides a striking illustration of the manner in which communicative capacity and responsibility may be attributed by projecting the causation of harm onto non-human entities. The existence of legal constructs such as the *juridical person* amounts to nothing more than an attempt to transfer responsibility onto a self-describing entity (Teubner, 2025); in doing so, collective action is placed on the same plane as individual agency. As previously noted, the modern trap into which we have fallen lies in the insistence on attributing, at all costs, agency and capacity to individual contracts within an organization, thereby running the risk of

illustrates that the values of equality and solidarity together constitute just justice; when considered separately, they yield only partial justice.

³ In the year 1522, the rats were summoned before the tribunal of Autun, in Burgundy. They were accused of the offence of having wilfully eaten and destroyed the crops of the surrounding district. The vicar of the bishop brought a formal criminal action against them. He issued a summons fixing a specific term for their appearance and appointed a local jurist by the name of Bartholomew Chasseneé to conduct their defence. In his pleading, Chasseneé invoked a number of significant anathemas drawn from the Old Testament: the divine curse of the serpent in the Garden of Eden; the law of Exodus, according to which an ox that strikes a man or a woman is to be stoned and its flesh not eaten; and Christ's curse of the fig tree of Bethany. He further cited Virgil, Ovid, Cicero, Aristotle, Gregory the Great, and the *Institutes* of Justinian. He referred to numerous examples of effective excommunications pronounced by medieval saints against sparrows, snails, leeches, eels, and even an entire orchard. Ultimately, on the basis of these procedurally rigorous arguments, the tribunal decided to adjourn the proceedings indefinitely and to render judgment in favour of the rats who had failed to appear, on the ground that it was impossible to determine a precise time-limit within which they could be required to present themselves. The rats had prevailed in the case (translated from Ewald, 1995).

putting the rats on trial once again. Actors do not exist *per se*; rather, they are constructed by social systems, which confer subjectivity upon semantic artefacts⁴. The extension of legal capacity beyond the natural person materializes in the attribution of personality to flows of information, thereby constructing, at the juridical level, the immortality of incorporeal entities (Latour, 1999). Through this speculative move, personification entails a transformed perception in the allocation of risk, opening the way to actors such as corporations, political parties and states. The personification of social systems thus entails that, within them, individual entities are vested with rights, obligations and civil liability which - attention must be paid - are not those of their members or participants, but are autonomous in nature. Following this line of reasoning, it may be argued that the algorithmic society pushes the jurist beyond the original fence, confronting legal thought with new questions—new superstitions and new forms of personification. The advent of new technologies, in fact, gives rise to “digital” entities capable of learning from experience and producing decisions no longer issued by human actors, but rather articulated as autonomous declarations of will⁵. These entities thus come to participate in negotiations and economic transactions within a fabric in which human actors, hybrid actors and complex networks coexist, forming an association of persons and non-persons. If we proceed from the assumption, drawn from systems theory, that “*the social reality of the juridical person is a collective - namely, the socially binding self-description of a system of actions organized as a cyclical linkage between identity and action*”, it becomes possible to hypothesize the personification of digital entities on the same footing as juridical persons. The legal system is connected to social structures mediated by social consensus within an autopoietic system, through the cyclical linkage between identity and action, which is juridically secured in the figure of the juridical person by means of personification and the coupling of environment and system, thereby pushing towards corporate social responsibility within a self-referential process. It is at this point that theories of causation yield to those of double contingency, where the crisis of legal causality emerges, giving way to basins of responsibility and risk (Rehbinder, 1989).

THE SELF-CONSTITUTIONALISATION OF LAW AND THE PRIVATE REGULATION OF RISK IN SOCIO-TECHNICAL NETWORKS

The study of risk attribution and liability becomes a valuable exercise aimed at understanding the evolution of law. The crisis of responsibility must be situated within the tensions existing between the structure of risk and the foundational concepts of liability. Causal chains, actor → causation → harm, intended to establish the connection between wrongdoer, action, and victim through a reasonable delimitation of the dynamics underlying a single event, begin to falter in the face of multiple and circular causation within the collectivization of liability law. Social configurations that can be identified as risk networks extend beyond individual actors, constituting organizational responsibility within a large risk pool, moving beyond individual liability toward collective responsibility within a compulsory social insurance consortium. The transformation of the causal nexus is driven by the need to compensate for harm in cases of complex and inscrutable causal relations, thereby expanding collective liability - like a dome - beyond individual attribution (Teubner, 2009). The causal links of responsibility within the risk pool are fractured; indeed, in a socio-technical network composed of both human and digital actors, and inherently risk-generating and transnational in nature, modern and innovative methods are required,

⁴ Scharpf 2000; 97 underscores the particular significance of attribution processes in the constitution of “complex actors”.

⁵ Refer to G. Teubner, *Soggetti giuridici digitali? Sullo status privatistico degli agenti software autonomi*, Esi, 2019.

whereby the market itself becomes a unit of responsibility. Thus, the new frontier of law leads to a shift from fault-based liability to strict liability, in which individual members of the network assume a supervisory role in compliance with established policies, within a socio-technical network serving a compensatory function, applicable in cases where individual liability would simply fail. The attribution of responsibility and corresponding compensation to the overarching structure would ensure that a portion of collective liability falls upon each participant within the risk pool. This study demonstrates how the normative self-production of networks constitutes itself, giving rise to a system that generates its own rules and, in certain respects, operates in competition with state law (Caterini, 2020). The evolution of transnational organizations provides a privileged terrain in which this new experimental approach to law becomes competitive. Market-share liability, for example, represents one possible solution to what might otherwise appear as regulatory anarchy. Numerous internal contractual arrangements delineate the allocation of responsibility according to respective shares of influence in external relations. This mechanism could, we contend, offer a potential solution for future compensation of harm, which, in the absence of network integration (given the risks of network connectivity and interconnection) and of software agents, might otherwise be unattainable. Liability apportioned according to market shares, through the creation of a corporate actor to whom actions, rights, and obligations are attributed—and which is subsequently subject to a process of regression in which both losses and gains are distributed according to each member's contribution - will, we believe, constitute the means by which private autonomy will assert itself using purely technical instruments. The advantages of collective liability lie in ensuring that the harmed party is compensated even in cases where individual causation cannot be established. Yet this comes at a cost. One can envisage the harmed party initiating a claim against the risk pool to obtain compensation, with subsequent internal allocation among its members; in terms of costs, this mechanism would undoubtedly be more efficient and would pave the way for private regulation of risk.

THE PRIVATE LAW OF THE FUTURE: A POSSIBLE EVOLUTIONARY HYPOTHESIS

The widespread implementation of technology, dominated by powerful oligopolies, inevitably drives economic actors toward collective risk management, while simultaneously fostering the spontaneous development of preventive measures. Internal, cooperative control of risk has been shown to outperform external oversight by courts; collaboration among enterprises, as subsystems of a complex system, can provide a valuable support mechanism when dealing with technologically sophisticated products. An interdependent chain spanning the entire production and distribution process, operating under a hybrid regulatory regime - in which the regulatory authority of public bodies, private law, public law, and corporate self-organization are combined - opens the way to a possible developmental trajectory. In short, it suggests a new paradigm at the intersection of market and organisation. A plausible hypothesis regarding the evolution of private law derives from the theory of communicative networks, in which systemic self-organization is self-referential, generating, so to speak, an existence “of its own”; in this scenario, *“self-referential circles interconnect so as to constitute the elements of a new system”* (Teubner, 2025). As argued by Luhmann, it is necessary to envisage distinct levels encompassing organic, psychic, and social autopoiesis, nourished by human communicative phenomena within a complex social system. Indeed, society is nothing more than the aggregate of human communications, forming a system endowed with its own identity (Mueller, 1986; Kaneko & Imai, 1987). Building on this perspective, we develop a hypothetical future scenario regarding the evolution of private law. If the regulatory autonomies of large socio-technical networks possess a constitutionalising property, and classical modern law is unable to adequately govern new technological phenomena, it is therefore, we

argue, appropriate to borrow both method and substance from a somewhat enigmatic discipline rooted in technicised custom: international commercial law. The construction of new global normative regimes occurs through a system that produces its own rules from its own operations, differentiated from other systems and through an internal selection process that translates environmental inputs into legal communication (for a discussion on the plurality of sources, see Grossi, 2019). The so-called *New Lex Mercatoria* represents the most accomplished example of this autopoietic dynamism (Gaillard, 2010), not a chaotic assemblage of mercantile practices devoid of state legitimacy, but a transnational legal order deriving its authority from the capacity to create rules, circulate them through global professional networks, and enforce them in international arbitral forums that provide an effective alternative to state courts (Schmitthoff, 1964; Goldmann, 2017). In 1956, P. C. Jessup introduced the concept of transnational law to describe the body of norms governing acts or events that transcend state boundaries, encompassing both public and private international law as well as non-state norms (Goode, 2016). From this perspective, international law is no longer confined to relations between sovereign states, but extends to private actors and global interactions; transnationality thus enables a proper understanding of the increasing legal complexity of international relations in the context of globalization. This capacity of private law to produce rules beyond state boundaries is by no means entirely novel: the history of medieval and modern commercial law demonstrates the persistence of autonomous mercantile norms. Yet today, it assumes an entirely unprecedented dimension (Michaels, 2007). This arises because global markets operate under conditions of simultaneity, interoperability, and hyper-connectivity, necessitating normative forms that are highly technical, instantaneous and uniform. State law, with its legislative production timelines and territorial scope, is no longer capable of providing an adequate response. Hence the emergence of a transnational legal ecosystem in which private actors are no longer merely regulated subjects but primary producers of rules (Teubner, 2012). Within this scenario, national law is reconfigured within systemic dynamics, assuming the role of second-order regulation, in which law ceases to function as a symbolic system and becomes an operational environment projecting toward a privatization of governance, situated between formal regularity and algorithmic regulation. In short, it represents a radical transformation of the relationship between subject and norm, within a new architecture in which legal rationality is supplanted by computational rationality -data-driven and risk-oriented - as theorised by Teubner in his seminal essay *Hybrids and Actants* (see on machinic language, Barbuzzi & Fontana, 2025; Fontana, 2025a; Fontana, 2025b). Within global digital platforms, automated financial markets, blockchain networks, artificial intelligence infrastructures, and data management systems, forms of private and transnational normativity emerge that do not depend directly on state legislative processes but arise from the interaction of economic interests, technical standards, software protocols, and organizational practices (Teubner, 2019; Zuboff, 2019). Terms of service, moderation policies, ranking algorithms, reputation systems, smart contracts, and automated compliance mechanisms assume an effective regulatory function, constituting material sources of law, albeit lacking formal recognition within traditional normative hierarchies.

Table 1 – The Transformation of Rights

Classical Law	Socio-technical Law
Liberty	Access
Property	Licensing
Privacy	Data Configuration
Defence	Automated procedure

The table 1 illustrates a shift from classical legal categories to socio-technical legal categories, showing how rights are redefined in digital environments. Rather than protecting only fixed individual spheres, contemporary law increasingly regulates access systems, data flows, and automated processes. The most significant transformation is the move from privacy to data configuration, which can also be understood as the passage from traditional privacy to modern data protection. In classical law, privacy mainly referred to protection against intrusion into one's private sphere. In the digital context, this is no longer sufficient, because the central issue is not only secrecy, but also how personal data are collected, structured, processed, shared, and reused. For this reason, data protection is broader than privacy, it concerns the governance of data processing as a whole, including transparency, purpose limitation, proportionality, and control over information. In this sense, data configuration emphasizes that legal protection today concerns not only confidentiality, but also the technical and normative architecture through which data are organized and made actionable. The focus therefore moves from defending private space to regulating the informational conditions that shape the individual's digital identity and autonomy.

Table 2 – Ontological transformation of Law

Modern Law	Socio-technical Law
Legal System	Operating System
Language	Code
Text	Infrastructure
Decision	Automation

Table 2 describes an ontological shift in the nature of law: from a modern legal order based on norms, interpretation, and written decisions to a socio-technical order in which law increasingly operates through digital architectures and automated systems.

The passage from legal system to operating system suggests that law is no longer understood only as a coherent body of rules, but also as an environment that structures behaviour through technical

frameworks. Likewise, the shift from language to code highlights that regulation is no longer expressed only through legal discourse, but also through software, algorithms, and machine-readable instructions. In the same way, the transformation from text to infrastructure shows that normativity is embedded not only in statutes and judgments, but also in platforms, databases, protocols, and digital design. Finally, the move from decision to automation marks one of the most important changes: legal ordering is no longer based exclusively on human deliberation applied case by case, but increasingly on preconfigured, automated procedures that shape outcomes in advance. Overall, the table shows that socio-technical law does not simply replace modern law, but redefines it by transferring part of its normative force from legal interpretation to technological architecture.

CONCLUSIONS

It can be asserted that the widespread implementation of new technologies is driving the dissolution of law understood in its classical sense, steering the normative and regulatory system toward new horizons that transcend the traditional concept of rule and fact. Unlike in the past, neo-law is no longer pre-existing to the event and applied to concrete cases; rather, it is self-produced by the very reality that contributes to its structuring. This constitutes a new, liquid configuration in which general and abstract commands typical of legal norms are replaced by technical devices embedded within automated digital structures. In this way, forms of private normativity with a transnational character emerge, which are not derived from state legislation but rather arise from economic relationships, technical standards, software protocols, and corporate policies. These elements assume the role of sources even if in a non-formalistic sense, giving rise to a systemic configuration capable of producing and reproducing its own rules by employing feedback and algorithmic computation, oriented toward adaptation within a logic of systemic functionality. This represents an automated technical law that goes beyond the traditional categories of liability and fault, focusing instead on risk management and the minimisation of systemic uncertainty. In this new context, the legal scholar is seriously challenged and called upon to resist being a mere mechanic of particulars rather than a scientist of universals; not merely a technician but a technologist, capable of understanding phenomenal dynamics, rather than being reduced to a cold, mechanical executor. Yet, this does not deny the necessity of anticipating the future; on the contrary, with a critical approach, the legal practitioner is required to engage in profound reflection and social analysis regarding the possibility of normative intervention in new contexts dominated by the complexity of socio-technical networks, balancing democratic legitimacy with functional legitimacy.

MAIN FINDINGS AND RESEARCH IMPLICATIONS

This research has demonstrated that new technologies are not simply affecting the application of law, but are transforming its normative structure by fostering hybrid and transnational forms of private regulation based on technical standards, digital infrastructures, and automated processes. In this context, traditional legal categories such as fault, causation, and adjudication appear increasingly insufficient to address complex socio-technical risks. At the same time, the study highlights the need for further research on the legitimacy, accountability, and democratic control of these emerging normative frameworks, with particular attention to how legal safeguards and responsibility mechanisms can be redefined in digitally mediated environments.

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