

Notes on the Potential and Risks of Algorithmic Activity

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Abstract

This contribution aims to provide insight into the potential and risks of algorithmic activity, specifically analyzing the impact of opaque artificial logics and their operating mechanisms on civil liability systems and creditworthiness assessment. As a revolutionary phenomenon that manifests in multiple ways and shapes the contemporary era, Artificial Intelligence sparks a mix of curiosity and concern among interpreters, entrusting them with the complex task of assessing the adequacy of legal categories in response to the new demands arising from technological advancements. However, this evaluation must always be guided by the awareness that the fundamental principles of the legal system remain the core framework to which Artificial Intelligence must necessarily conform.

I. The Revolutionary Impact of Artificial Intelligence: Applications and Definitional Challenges

‘The reluctance to pose questions [...] about the proliferation of algorithms’¹ in an era, like the modern one, profoundly marked by a pervasive process of technologization² capable of permeating, on multiple levels, the unfolding of every human relationship,³ means that the issue becomes even more delicate when it intersects with social systems. In fact, the progressive reconstruction of legal relationships in digital language, as accelerated by the articulated trend towards the fragmentation and reproduction of every profile of human experience, and at the same time linked to the design of computerized machines, that is, true artificial substitutes for humans, has led over time to an increasingly frequent reliance on algorithmic activity.⁴

Indeed, as is typically the case with topics that have gradually attracted scholarly attention,⁵ the radical transformations in the modern landscape provoke a mixture of curiosity and concern in the interpreter. Specifically, discussing algorithmic

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¹ B. Romano, *Algoritmi al potere. Calcolo giudizio pensiero* (Torino: Giappichelli, 2018), XVI.

² R. Kurzweil, *La singolarità è vicina* (Milano: Apogeo – Maggioli Editore, 2008), 197 s.

³ S. Rodotà, *Tecnopolitica. La tecnologia e le nuove tecnologie della comunicazione* (Roma-Bari: Editori Laterza, 2nd ed, 2004), *passim*.

⁴ P. Zellini, *La dittatura del calcolo* (Milano: Adelphi, 2018), 51.

⁵ P. Femia, *Introduzione. Soggetti responsabili. Algoritmi e diritto civile*, in G. Teubner ed, *Soggetti giuridici digitali? Sullo status privatistico degli agenti software autonomi* (Napoli: Edizioni Scientifiche Italiane, 2019), 7.

activity and, more generally, Artificial Intelligence (AI) first requires the awareness of confronting a

‘revolutionary event of global scope, capable of impacting cultural, social, economic, political, and legal models transversely, giving rise to a [series of] oftended [interconnected] processes’.⁶

Moreover, the complexity and extreme heterogeneity of its manifestations are evident even at the stage of attempting to find a shared definition, given the numerous obstacles encountered in various efforts to qualify AI⁷ often in relation to an intelligence that is only presumed, generally detached from a purely artificial essence.⁸

The shift from an embryonic perspective, which tended to view the phenomenon merely as a ‘more or less appropriate metaphor’,⁹ to reconstructions aimed at emphasizing its elusiveness,¹⁰ appears to reach a turning point – though not without criticism – in the notion articulated in Art 3 of Regulation (EU) 2024/1689, the so-called *AI Act*.¹¹ According to this regulation, Artificial Intelligence is defined as

‘an automated system designed to operate with varying levels of autonomy, which may exhibit adaptability after deployment, and which, for explicit or implicit purposes, deduces from the *input* it receives how to generate *output* such as predictions, content, recommendations, or decisions that may influence physical or virtual environments’.

While the result of a highly complex process, synthesizing various methodologies and techniques, the regulatory framework providing harmonized rules on Artificial Intelligence represents a useful starting point – certainly an ambitious one¹² – especially considering that Europe is the first in the world to establish such a set of rules. This regulation takes a comprehensive approach to a phenomenon that undeniably requires interdisciplinary handling. As the Regulation explicitly states, its goal is twofold: on the one hand, to promote the development and use of Artificial Intelligence while ensuring a high level of protection for public interests,¹³ such as

⁶ C. Perlingieri, *Intelligenza Artificiale tra principi e regole*, in Ead ed, *Innovazione tecnologica e diritto civile. Saggi* (Napoli: Edizioni Scientifiche Italiane, 2025), 187, 189.

⁷ G. Lo Sapio, ‘L’Artificial Intelligence Act e la prova di resistenza per la legalità algoritmica’ *Federalismi.it*, 274 (2024); B. Berendt, *Artificial General Intelligence*, in G. Comandè ed, *Elgar Encyclopedia of Law and Data Science* (Cheltenham: Edward Elgar Publishing, 2022), 53-59.

⁸ I. Carnat, ‘Intelligenza Artificiale e responsabilità civile’ *Enciclopedia del diritto, I Tematici, Responsabilità civile* (Milano: Giuffrè, 2024), 656.

⁹ M. Ferraris, ‘Intelligenza artificiale e naturale: perché non avere paura’ *Aspenia*, 39 (2024).

¹⁰ L. Floridi, *Etica dell’intelligenza artificiale. Sviluppo, opportunità, sfide* (Milano: Raffaello Cortina Editore, 2022), 40.

¹¹ Regulation (EU) 2024/1689 of the European Parliament and of the Council available at <https://eur-lex.europa.eu>.

¹² I. Carnat, n 8 above, 667.

¹³ Cf Regulation (EU) 2024/1689 n 11 above, considerando no 7, 2.

health, safety, and the protection of fundamental rights;¹⁴ on the other hand, to address the associated issues. It is important to note that its several prerogatives – primarily focusing on the rationalization of cognitive processes, leading to greater efficiency, productivity and competitiveness¹⁵ – are counterbalanced by an unlimited series of critical issues,¹⁶ either determined or determinable.

From this viewpoint, an assessment of the potential and risks of algorithmic activity must necessarily involve identifying the principles and values to which Artificial Intelligence must adhere.¹⁷ These principles serve as a benchmark for evaluating its various practical applications and, at the same time, as a means of verifying their actual effectiveness within the system. This reflection inevitably takes shape within the framework of European anthropocentric logic,¹⁸ which seeks to ensure ‘the development of safe and reliable Artificial Intelligence’¹⁹ in full respect of ‘ethical principles’,²⁰ while reinforcing ‘the human dimension and the centrality of the individual and their fundamental rights within the digital ecosystem’.²¹

II. The Rigorous *Risk-Based Classification of Algorithmic Activity Under the AI Act*

Drawing from the AI Act, it emerges that, in order to avoid prejudice against the values on which the European Union is founded, a strict and uniform system has been adopted, based on a non-differentiated logic, one designed to be broadly applicable across different subjects and domains. In response to the many

¹⁴ Among them, ‘human dignity, freedom, equality, democracy and the rule of law and fundamental rights enshrined in the Charter, including the right to non-discrimination, to data protection and to privacy and the rights of the child’, cf Regulation (EU) 2024/1689 n 11 above, considerando no 28, 8.

¹⁵ On the subject, cf European Parliament resolution of 12 February 2019, ‘Una politica industriale europea globale in materia di robotica e intelligenza artificiale’, (A8-0019/2019), point D, available at <https://tinyurl.com/2xsrm7xe> (last visited 31 January 2026).

In doctrine, especially G. Resta, ‘Governare l’innovazione tecnologica: decisioni algoritmiche, diritti digitali e principio di uguaglianza’ *Politica del diritto*, 211 (2019).

¹⁶ P. Perlingieri, ‘Relazione conclusiva’, in Id., S. Giova and I. Prisco eds, *Il trattamento algoritmico dei dati tra etica, diritto ed economia*. Atti del 14° Convegno Nazionale (Napoli: Edizioni Scientifiche Italiane, 2020), 379; C. Perlingieri, ‘Diritto privato delle nuove tecnologie: contenuti e competenze *Tecnologie e diritto*, 70 (2021).

¹⁷ C. Perlingieri, *Intelligenza Artificiale tra principi e regole* n 6 above, 191.

¹⁸ P. Benanti, *Le macchine sapienti. Intelligenze artificiali e decisioni umane* (Bologna: Marietti 1829, 2018), 63; Id., *Oracoli. Tra algoretica e algocrazia* (Roma: Luca Sossella Editore, 2018), 73; A. Alpini, ‘Sull’approccio umanocentrico all’intelligenza artificiale. Riflessioni a margine del “Progetto europeo di orientamenti etici per una I.A. affidabile”’ *ComparazioneDirittoCivile.it*, 2 (2019); E. Battelli, ‘Necessità di un umanesimo tecnologico: sistemi di intelligenza artificiale e diritti della persona’ *Il diritto di famiglia e delle persone*, 1096 (2022).

¹⁹ Cf European Parliament resolution of 20 October 2020 (2020/2012(INL)), available at <https://tinyurl.com/2resw8zb> (last visited 31 January 2026).

²⁰ Cf Regulation (EU) 2024/1689 n 11 above, considerando no 8, 2.

²¹ C. Perlingieri, *Intelligenza Artificiale tra principi e regole* n 6 above, 192.

uncertainties posed by algorithmic *operations*, the approach has been to establish standardized solutions, guided by a logic centered on the concept of risk²² understood in its dual dimension of ‘the probability of harm occurring’ and the ‘severity of the harm itself’.

Specifically, in accordance with the principle of proportionality, activities are rigorously classified based on their level of inherent risk.²³ At the same time, particularly for generative Artificial Intelligence systems, transparency requirements are imposed to ensure that, during the model’s design phase, the reproduction of illegal content is prevented and that it remains unmistakably clear when an output has been generated by AI.

However, from the outset, this approach has not only laid bare its own inconsistencies but has also even more starkly revealed its fundamental inadequacy²⁴ in regulating the foreseeable developments of Artificial Intelligence applications. The fact that the classification is made *ex ante*, based solely on the ‘intended purpose’ - that is, ‘[the] use of an AI system as envisioned by the provider, including the specific context and conditions of use’,²⁵ is inherently incompatible with the dynamic nature of algorithmic systems,²⁶ which are subject to constant change due to their variability, complexity, and computational unpredictability.²⁷

The real challenge, in fact, lies in evaluating whether the regulation can effectively reconcile a *quantitatively* driven risk approach, typical of product safety standards, with the goal of ensuring a high level of protection for fundamental rights, which demands a more *qualitative* approach.²⁸

A few striking examples, among the many that could be cited, may help to shed light on the key aspects of the issue.

III. Algorithms and Civil Liability

An important area of observation that highlights the *impasse* created by the rapid development of algorithmic technology and the boundless scope of its applications can undoubtedly be found in the realm of civil liability. In this context,

²² On the risk-based approach, G. Finocchiaro, ‘La proposta di regolamento sull’Intelligenza Artificiale: il modello europeo basato sulla gestione del rischio’ *Il diritto dell’informazione e dell’informatica*, 303 (2022); C. Novelli, ‘L’Artificial Intelligence Act Europeo: alcune questioni di implementazione’ *Federalismi.it*, 95 (2024).

²³ In the structure of the European Regulation, a scheme with four different risk levels is reproduced.

²⁴ Is emblematic, for example, the classification of video game systems among the lowest-risk systems, C. Novelli, n 22 above, 95.

²⁵ Cf Regulation (EU) 2024/1689, n 11 above, considerando no 12, 47.

²⁶ G. Lo Sapio, n 7 above, 282.

²⁷ J. Kaplan, *Intelligenza artificiale. Guida al futuro prossimo* (Roma: LUISS University Press, 2018), 203.

²⁸ M. Almada and N. Petit, ‘The EU AI Act: a medley of product safety and fundamental rights’ 59 *European University Institute, RSC*, 7 (2023); I. Carnat, n 8 above, 672.

at the crossroads of various regulatory proposals, lies the relationship between Artificial Intelligence and the human person. This relationship is subject to a constitutionally-oriented interpretation,²⁹ which must ensure that the individual retains inviolable rights and non-derogable duties, while also granting machines – intelligent as they may be – adequate protection as ‘things’,³⁰ even if, from a *de iure condendo* perspective, they are eventually recognized as possessing autonomous centers of power and responsibility.³¹

The subject invites a series of reflections which converge upon a shared foundational premise. It is, indeed, scarcely open to doubt that the entire framework of civil liability necessitates a profound and systematic reconsideration³² one capable of aligning the foundational principles governing imputability, as applied to specific factual circumstances, with the multifaceted functions underpinning the discipline,³³ all while addressing the novel challenges posed by emerging technologies. In this regard, however, the absence of a harmonized regulatory framework – save for the domain of defective products³⁴ – ought not to result in the reductive inference that Artificial Intelligence constitutes solely a source of peril. As has been aptly observed,³⁵ the critical issue resides not in the technology *per se*, but rather in the manner in which it is employed by human agents.

Undoubtedly, the digital reality, if poorly constructed, ‘can profoundly and negatively influence’ human existence ‘representing a constant risk’,³⁶ especially when potential safeguards are not identified. Foremost among these safeguards should be the establishment of strict limits on algorithms and the underlying

²⁹ P. Benanti, *Le macchine sapienti* n 18 above, 125; P. Perlingieri, ‘Relazione’ n 16 above, 386.

³⁰ On the subject, J. Nida-Rümelin and N. Weidenfeld, *Umanesimo digitale. Un’etica per l’epoca dell’intelligenza artificiale*, translated by G.B. Demarta (Milano: Franco Angeli, 2019), *passim*.

³¹ For more insights, A. Procida Mirabelli di Lauro, ‘Le intelligenze artificiali tra responsabilità civile e sicurezza sociale’, in P. Perlingieri, S. Giova and I. Prisco eds, *Rapporti civilistici e intelligenze artificiali: attività e responsabilità*. Atti del 15° Convegno Nazionale (Napoli: Edizioni Scientifiche Italiane, 2020), 297.

³² M. Grondona, *La responsabilità civile tra libertà individuale e responsabilità sociale. Contributo al dibattito sui «risarcimenti punitivi»* (Napoli: Edizioni Scientifiche Italiane, 2017), 158; A. Malomo, *Responsabilità civile e funzione punitiva* (Napoli: Edizioni Scientifiche Italiane, 2017), 83; G. Perlingieri and G. Zarra, *Ordine pubblico e internazionale tra caso concreto e sistema ordinamentale* (Napoli: Edizioni Scientifiche Italiane, 2019), 166; M. Gambini, ‘Responsabilità civile e controlli del trattamento algoritmico’, in P. Perlingieri, S. Giova and I. Prisco eds, *Il trattamento algoritmico* n 16 above, 313.

This perspective is also widely shared in case law. *Ex multis*, cf Corte di Cassazione Sezioni unite 5 July 2017 no 16601, *Giurisprudenza italiana*, 1787 (2017); Corte di Cassazione 16 May 2016 no 9978, *ibid*, 1856 (2016); Corte di Cassazione 7 April 2015 no 6925, *ibid*, 562 (2016).

³³ For an extensive discussion on the subject, G. Calabresi, *Costo degli incidenti e responsabilità civile. Analisi economico giuridica* (Milano: Giuffrè Editore, 1975), *passim*; P. Perlingieri, ‘La responsabilità civile tra indennizzo e risarcimento’ *Rassegna di diritto civile*, 1061 (2004); Id, ‘Le funzioni della responsabilità civile’, *ibid*, 115 (2011).

³⁴ Directive (EU) 2024/2853 of the European Parliament and of the Council of 23 October 2024 on Liability for Defective Products available at <https://eur-lex.europa.eu>.

³⁵ P. Perlingieri, ‘Note sul «potenziamento cognitivo»’ *Tecnologie e diritto*, 209 (2021).

³⁶ P. Perlingieri, ‘Diritto civile e Intelligenza Artificiale’ *Tecnologie e diritto*, 150 (2025).

mechanisms that drive them. From this standpoint, only shared and pervasive oversight can prevent algorithmic processes from, instead of assisting and enhancing human abilities, dominating individuals through their statistical-computational logics,³⁷ thereby undermining autonomy and stifling personal development.³⁸

When transposing the issue to an operational level and simplifying a much more complex discussion, the primary concern lies in the fact that, in general, algorithmic activity refers to a computational procedure that, by aggregating and programming an almost infinite amount of data, extrapolates further information, leading to approximated results.³⁹ This happens because, typically, processing occurs through a binary digital system, involving simplifications and reductions that, by introducing errors proportional to the increasing size of numbers,⁴⁰ inevitably lead – based on instructions and intermediate steps often kept opaque – to the rounding of results at each operation. In this way, Artificial Intelligence, understood as a ‘syntactic engine’⁴¹ largely *legibus solutus*,⁴² would replace human judgment and conscience with calculation and arbitrariness. The effect is that technology could transform humans into mere extensions of itself,⁴³ significantly increasing the danger of total subjugation.⁴⁴

In this context, by narrowing the investigation to the factual realities in which, as represented, algorithmic activity undoubtedly plays a central role,⁴⁵ attention focuses, on one hand, on the performance of services in the information society – consider, for example, the algorithmic processing of data that underpins the functioning of search engines, or the computational analysis of information pools crucial for *online* content-sharing services; on the other hand, attention shifts to the new forms of Artificial Intelligence, even in the more advanced applications of robotic technology, which are increasingly evident in the processes of goods production – such as autonomous vehicles⁴⁶ – and service provision, both in the

³⁷ P. Benanti, *Le macchine sapienti* n 18 above, 108.

³⁸ *ibid* 123, 127; P. Perlingieri, ‘Note sul «potenziamento cognitivo»’ n 35 above, 210.

³⁹ On the subject, please refer to I. Martone, ‘Algoritmi e diritto: appunti in tema di responsabilità civile’ *Tecnologie e diritto*, 128, 131 (2020).

⁴⁰ P. Perlingieri, ‘Relazione conclusiva’, in C. Perlingieri e L. Ruggeri eds, *Internet e diritto civile* (Napoli: Edizioni Scientifiche Italiane, 2015), 419, emphasises that, within the algorithmic processing process, the volume, variability, speed of the data converted into numbers and their ability to be highly correlated are of decisive importance; D. Di Sabato, *Strumenti riparatori e risarcitori*, in P. Perlingieri, S. Giova and I. Prisco eds, *Il trattamento algoritmico* n 16 above, 338.

⁴¹ L. Floridi, *Etica dell’intelligenza artificiale* n 10 above, 275.

⁴² P. Perlingieri, ‘Relazione conclusiva’ n 16 above, 386; Id, ‘Sul trattamento algoritmico dei dati’ *Tecnologie e diritto*, 181, 187 (2020).

⁴³ G. Limone, *La macchina delle regole, la verità della vita. Appunti sul fondamentalismo macchinico nell’era contemporanea* (Milano: Franco Angeli, 2015), 18.

⁴⁴ C. O’Neil, *Armi di distruzione matematica. Come i Big Data aumentano la disuguaglianza e minacciano la democrazia*, translated by D. Cavallini (Firenze: Bompiani, 2017), 8; P. Perlingieri, ‘Note sul «potenziamento cognitivo»’ n 35 above, 210.

⁴⁵ M. Gambini, ‘Responsabilità civile e controlli’ n 32 above, 315-316.

⁴⁶ So that in doctrine it is commonly referred to as the ‘new future of mobility’. G. Calabresi and E. Al Mureden, Driverless cars. *Intelligenza artificiale e futuro della mobilità* (Bologna: il

healthcare sector,⁴⁷ as well as in labor⁴⁸ and public administration.⁴⁹

Indeed, alongside the potential benefits primarily linked to the speed and rationalization of processes, with a considerable impact on outcomes as well, there emerge multiple risks that, in certain respects, remain not entirely perceivable in their full extent. In fact, starting from the assumption that in most current practical scenarios, the novelty lies not in the nature of the damage itself, but rather in the manner in which the harmful event is produced,⁵⁰ the issue requires a preliminary decision: it is a matter of deciding whether it is more appropriate to apply the rules of strict liability, risk management, or, specifically with regard to the case of autonomous vehicles, to establish a regime of compulsory insurance supplemented by a fund that ensures compensation in the absence of insurance coverage.⁵¹

In light of this, it seems insufficient to merely introduce regulations on the civil liability of autonomous vehicles, as has already been done in Italy, or to attribute partial or full subjectivity to so-called ‘machine agents’⁵². While these efforts aim to address the damages caused by intelligent artificial systems, they only achieve limited success, ultimately contributing to the widening of the gap created by generative Artificial Intelligence. Conversely, each case should be carefully analyzed by deconstructing ‘the complex procedural structure that characterizes the mode of action’,⁵³ that is, each individual activity that may potentially harm the human legal sphere, so as to frame it within the context of the relevant attribution criteria. This must be done with the recognition that subjectivity can undoubtedly play a decisive role in determining liability and the consequent compensability of damages, but only to the extent that, within the examined dynamics, one can discern with adequate precision ‘the ‘role’ of the action governed by technology and [where

Mulino, 2021), *passim*.

⁴⁷ For more information on the subject, C. Perlingieri, ‘Intelligenza artificiale in ambito medico-sanitario: profili di ricostruzione normativa a séguito dell’AI Act’, in Ead ed, *Innovazione tecnologica e diritto civile* n 6 above, 131; Ead, ‘Transizione digitale nella sanità ed ecosistema dei dati sanitari: profili ricostruttivi del fenomeno circolatorio e implicazioni sui dati genetici’, *ibid*, 159.

⁴⁸ For a series of insights, F. Bano, ‘Algoritmi al lavoro. Riflessioni sul management algoritmico’ *Lavoro e diritto*, 133 (2024); L. Zappalà, ‘Dalla digitalizzazione della pubblica amministrazione all’amministrazione per algoritmi: luci e ombre dell’effetto disruptive sui rapporti di lavoro’ *Federalismi.it*, 232 (2024).

⁴⁹ Among others S.B. Greci, ‘Le applicazioni di Intelligenza Artificiale a supporto dell’automazione del procedimento amministrativo’ *Rivista italiana di informatica e diritto*, 217 (2024); F. Conte, ‘Il ruolo del principio di risultato e della digitalizzazione nel processo di riforma della pubblica amministrazione’ *Amministrativ@mente*, 1290 (2024).

⁵⁰ This, on the basis of a reading of liability in terms of a response to unjust damage, attributing maximum importance to the interest harmed: R. Scognamiglio, ‘Illecito (diritto vigente)’ *Novissimo Digesto italiano* (Torino: UTET, 1962), VIII, 164; P. Perlingieri, ‘La responsabilità civile’ n 33 above, 1061; Id, ‘L’onnipresente art. 2059 c.c. e la “tipicità” del danno alla persona’ *Rassegna di diritto civile*, 520 (2009).

⁵¹ M. Ferrari, ‘Realtà algoritmica e norme “tecno-giuridiche”’ *Foro italiano*, 372 (2024); P. Perlingieri, *Diritto civile e Intelligenza Artificiale* n 36 above, 139.

⁵² G. Teubner ed, *Soggetti giuridici digitali?* n 5 above, 27.

⁵³ P. Perlingieri, *Diritto civile e Intelligenza Artificiale* n 36 above, 145.

applicable,] the degree of human ‘involvement in the decision-making process’.⁵⁴

In other words, within the manifestations of algorithmic activity – ultimately stemming from human action – shaped by a complexity that is evident both in the system’s architecture and in the variety of parties involved,⁵⁵ it is crucial to determine whether there are forms of a) integration between human and technology, or b) substitution of technology for humans.⁵⁶ In the first scenario, whenever the algorithm collaborates with human action, responsibility should be attributed jointly, following a careful assessment of the interplay between the two ‘acting subjects’. Specifically, in accordance with the principles of proportionality and reasonableness,⁵⁷ the manufacturer could be held jointly liable for damages with the programmer, leading to a reduction and/or potential exclusion of the user’s liability, depending on the degree of diligence – whether more or less stringent – exercised in the performance of the activities. In the second case, whenever the algorithm operates as a genuine legal agent, liability should *in primis* rest with the producer of the intelligent system, and only secondarily with the individual who has used it negligently or recklessly.

On the other hand, for an accurate reconstruction of the liability profile associated with the harmful conduct, the involvement of the algorithm in the communication process⁵⁸ – as a dynamic element within the system it is embedded in⁵⁹ – becomes decisively important. This is due to both the function it serves and its capacity to alter and make decisions that are unpredictable.⁶⁰ In practical terms, this requires the programmer to install a *black box* in every so-called intelligent machine,⁶¹ a prerequisite for reconstructing the specific decision-making process of Artificial Intelligence ‘in order to [potentially] assign responsibility and seek

⁵⁴ P. Perlingieri, *Diritto civile e Intelligenza Artificiale* n 36 above, 145.

⁵⁵ I. Carnat, n 8 above, 658.

⁵⁶ For a detailed reconstruction of the mechanisms of imputability, with specific reference to the distinction between the figures of the programmer, the producer and the user of the algorithmic system, please refer to I. Martone, ‘Algoritmi e diritto’ n 39 above, 148.

⁵⁷ On the hermeneutical and axiological relationship of the principles of proportionality and reasonableness, G. Perlingieri, *Profili applicativi della ragionevolezza nel diritto civile* (Napoli: Edizioni Scientifiche Italiane, 2015), 103, 132.

⁵⁸ E. Esposito, ‘Artificial Communication? The Production of Contingency by Algorithms’ 46 *Zeitschrift für Soziologie*, 249-250 (2017).

⁵⁹ Some insights already in I. Martone, ‘Algoritmi e diritto’ n 39 above, 144, echoing the remarks of U. Ruffolo, ‘Intelligenza artificiale, machine learning e responsabilità da algoritmo’ *Giurisprudenza italiana*, 1692 (2019).

⁶⁰ A. Bertolini, ‘Robots as Product: The Case for a Realistic Analysis of Robotic Applications and Liability Rules’ *Law Innovation and Technology*, 214 (2013); S. Kirn and C.D. Müller-Hengstenberg, ‘Intelligente (Software) Agenten: Eine neue Herausforderung für die Gesellschaft und unser Rechtssystem?’ *fzid.uni-hohenheim.de*, 4 (2014); M. Lohmann, ‘Roboter als Wundertüten: Eine zivilrechtliche Haftungsanalyse’ *Aktuelle juristische Praxis*, 158 (2017); G. Borges, ‘Rechtliche Rahmenbedingungen für autonome Systeme’ *Neue Juristische Wochenschrift*, 978 (2018); R. Bichi, ‘Intelligenza Artificiale tra “calcolabilità” del diritto e tutela dei diritti’ *Giurisprudenza italiana*, 1772 (2019).

⁶¹ F. Pasquale, *The Black Box Society. The Secret Algorithms That Control Money and Information* (Cambridge-London: Harvard University Press, 2015), *passim*.

compensation'.⁶² However, as has been widely noted,⁶³ this measure currently proves only partially effective for at least two reasons: *in primis*, because it demands a high level of expertise for decipherability; and *in secundis*, it must be noted that the mere knowledge of the source code cannot be assumed to be sufficient to ensure the intelligibility of the system.⁶⁴

This is a problematic issue that should not be underestimated, particularly when considering that, in most of the attempts recorded to date, efforts to adapt and reshape models of responsibility are generally hindered by the insurmountable obstacle of the inaccessibility of algorithmic activity.⁶⁵

It cannot be ignored that the processing of information flows expressed through mathematical language, which often generate and self-generate, tends to undermine rather than enhance the effectiveness of proposed solutions or respect the unique features of individual case.⁶⁶ This dynamic ultimately results in a violation of the principle of substantive equality,⁶⁷ which, in turn, gives rise to a series of further, interconnected critical issues. The primary concern, first and foremost, is ensuring the accuracy and currency of the algorithms, or more specifically, the quality of the data they rely on, to prevent erroneous information from leading to flawed computations.⁶⁸ Secondly, a strictly logical and content-related aspect comes into play. Algorithms, in fact, may betray – even in their mathematical formulations – the ‘preconceptions of those who design them, or the historical data sets used as references’, with the further and automatic risk of interpreting the connections within such historical data ‘as necessarily causal relationships’.⁶⁹ Finally, it becomes

⁶² Cf European Commission, White Paper on Artificial Intelligence - A European Approach to Excellence and Trust of 19 February 2020, COM (2020) 65 fin. 16, available at <https://commission.europa.eu>; European Commission, Report on the Security and Liability Implications of Artificial Intelligence, the Internet of Things and Robotics, COM (2020) 64 fin., 10-11, available at <https://commission.europa.eu>.

⁶³ E. Pellecchia, ‘Profilazione e decisioni automatizzate al tempo della black box society: qualità dei dati e leggibilità dell’algoritmo nella cornice della responsible research e innovation’ *Nuove leggi civili commentate*, 1210 (2018); A. Alpini, ‘Sull’approccio umanocentrico’ n 18 above, 4; A. Ottolia and P. Rossi, ‘Il problema della trasparenza algoritmica’ *Annuario di diritto comparato e di studi legislativi*, 87 (2020); P. Perlingieri, ‘Relazione conclusiva’ n 16 above, 388; I. Martone, ‘Algoritmi e diritto’ n 39 above, 146.

⁶⁴ ‘The source code exposes the learning path and not the decision rules based on the data, without identifying the cause of variations’, J.A. Kroll et al, ‘Accountable Algorithms’ 165 *University of Pennsylvania Law Review*, 633, 660 (2017).

⁶⁵ M. Mazzotti, ‘Per una sociologia degli algoritmi’ *Rassegna italiana di sociologia*, 465 (2015); M. Gambini, ‘Algoritmi e sicurezza’ *Giurisprudenza italiana*, 1726 (2019); G. Schneider, ‘Intelligenza artificiale e decisioni automatizzate: la responsabilità “regolatoria” d’impresa, oltre la compliance’ *Rivista di diritto dell’impresa*, 152 (2022); S. Pietropaoli, ‘Dalla sorveglianza al controllo: la parabola della governamentalità algoritmica’ *Rivista italiana di informatica e diritto*, 29 (2024).

⁶⁶ G. Limone, n 43 above, 18.

⁶⁷ G. Carapezza Figlia, ‘Decisioni algoritmiche tra diritto alla spiegazione e divieto di discriminare’ *Persona e mercato*, 638 (2023).

⁶⁸ G. Finocchiaro, ‘Intelligenza Artificiale e protezione dei dati personali’ *Giurisprudenza italiana*, 1674 (2019); P. Perlingieri, ‘Sul trattamento algoritmico dei dati’ n 42 above, 182.

⁶⁹ A. Soro, ‘Big Data e libertà nella dimensione digitale’, 23 agosto 2018, available at

essential to examine the specific *modus operandi* of algorithmic activity, with particular attention to the role assumed by the algorithm, especially in cases where it is ‘capable of making decisions and implementing them in the external world, independently of any control or influence’.⁷⁰

Thus, the European Regulation places particular emphasis on the transparency and explainability of the mechanisms underlying Artificial Intelligence. In particular, to prevent the harmful effects stemming from the opacity of algorithmic activity, it is crucial to ensure comprehensive visibility of the operational mechanisms that constitute the system. This involves making identifiable both the methods used for data collection and the processes upon which they are based, as well as the justifications for these processes, which reflect a specific historical and cultural context in which the algorithms themselves are inherently rooted.⁷¹

IV. Algorithms and *Credit Scoring* in Financial Markets

As previously noted, the challenge of ensuring accessibility and intelligibility of algorithmic activity pervades virtually every aspect of factual reality. In this context, another area that clearly reflects the challenges posed by the rapid pace of technological development and the boundless nature of its applications is undoubtedly the financial markets.⁷² From various perspectives, significant concerns have been raised about the impact of new technologies on the system, particularly in terms of the profound transformations affecting how financial products and services are conceived, developed, distributed, and consumed.⁷³

Within this framework, particular emphasis must be placed on *credit scoring*,⁷⁴ a critical phase in the assessment of creditworthiness. This evaluation – grounded

<https://tinyurl.com/2dsx4azf> (last visited 31 January 2026).

⁷⁰ On the problem of autonomy, cf G. Borges, *Liability of the Operator of AI systems De Lege Ferenda*, in S. Lohsse et al eds, *Liability for AI* (Münster: Baden-Baden, 2023), 168.

⁷¹ P. Perlingieri, *Diritto civile e Intelligenza Artificiale* n 36 above, 147.

⁷² M. Delmastro and A. Nicita, *Big data. Come stanno cambiando il nostro mondo* (Bologna: il Mulino, 2019), 14; L. Enriques and W.G. Ringe, ‘Bank-fintech Partnerships, Outsourcing Arrangements and the Case for a Mentorship Regime’ *Capital Markets Law Journal*, 374 (2020); R. Oriani, *Opportunità e rischi per l’industria finanziaria nell’era digitale*, in G. Cassano et al eds, *Banche, Intermediari e Fintech* (Milano: Giuffrè Editore, 2021), 10.

⁷³ R. Lener, *Tecnologie e attività finanziaria*, in P. Perlingieri, S. Giova and I. Prisco eds, *Il trattamento algoritmico* n 16 above, 197; L. Ammannati and G.L. Greco, ‘Il credit scoring “intelligente”: esperienze, rischi e nuove regole’ *Rivista di diritto bancario*, 461 (2023).

⁷⁴ In fact, credit scoring has never been the subject of specific regulation. Generic references to the activity can only be found in CRD IV and CRR, as well as in the 2020 EBA Guidelines on Credit Management and Monitoring and in the 2018 ECB Fintech Bank Guidelines, accompanied by a series of more or less significant hints that can be extrapolated from the case history of ABF rulings. On this topic see, at least, the reflections of F. Mattassoglio, ‘Usi degli algoritmi nel mercato del credito: dimensione nazionale ed europea’ *Giurisprudenzadellefonti.it*, 918 (2021); R. Di Raimo, *Accesso al credito e valutazione del merito creditizio*, in G. Conte ed, *Arbitro Bancario Finanziario* (Milano: Giuffrè Editore, 2021), 211; M. Rabitti, ‘Credit scoring via machine learning e prestito responsabile’ *Rivista di diritto bancario*, 175 (2023).

in the use of ‘adequate information’ (Art 124-*bis* of the Italian Consolidated Banking Act)⁷⁵ – serves as a prerequisite for the granting of credit, in line with the broader obligation of ‘sound and prudent management’ (Art 5 of the same Act).⁷⁶ These overarching ‘regulatory principles’⁷⁷ guide the conduct of financial intermediaries and have a direct impact on their relationships with clients. Even in the absence of detailed regulation regarding the specific procedures to be adopted,⁷⁸ credit scoring stands as ‘the primary safeguard for risk containment’⁷⁹ both at the individual and systemic levels.

However, when the evaluation is delegated to the algorithm and thus shifted to technological circuits, a critical issue arises regarding the compatibility of the opaque algorithmic logic with the so-called ‘system rules’. This, in turn, gives rise to a series of practical implications, mainly related to the potential interference between the managerial and strategic choices of the financing entity and the fundamental rights of the individual as a client. In this regard, algorithmic *credit scoring* presents distinctive characteristics compared to traditional approaches. With the use of Artificial Intelligence methods expanding rapidly,⁸⁰ current practice – aside from instances in which data are provided directly by the client⁸¹ – typically involves the extraction of information from the intermediary’s internal sources or from specialized credit registries and databases. These are generally processed using linear regression models and predominantly statistical methodologies.⁸² Specifically, the application of technology facilitates the integration of two categories of data: *Soft-Data*, drawn from the tracking of non-financial digital activities⁸³,

⁷⁵ Based on European consumer credit law and the law on over-indebtedness, among the numerous judgments, cf. Corte di Cassazione 30 June 2021 no 18610, *Fallimento*, 1207 (2021), with commentary by A.A. Dolmetta, ‘“Merito del credito” e procedure di sovraindebitamento’.

⁷⁶ On the principle of ‘sound and prudent management’, U. Minneci, ‘La verifica del merito creditizio: una valutazione a sua volta sindacabile?’ *Rivista trimestrale di diritto dell’economia*, 354 (2021); F. Sartori, ‘Disciplina dell’impresa e statuto contrattuale: il criterio della “sana e prudente gestione”’ *Banca borsa titoli di credito*, 150 (2017).

⁷⁷ A.A. Dolmetta, ‘Valutazione del merito creditizio e diligenza del finanziatore’ *Fallimento*, 1581 (2022).

⁷⁸ L. Ammannati and G.L. Greco, ‘Piattaforme digitali, algoritmi e big data: il caso del credit scoring’ *Rivista trimestrale di diritto dell’economia*, 305 (2021), ‘the Italian legislator and supervisory authority have been concerned with regulating the end (the sound and prudent management of the institution, in the specific sense of credit risk) rather than the means (the assessment of creditworthiness)’.

⁷⁹ C. Brescia Morra, *Il diritto delle banche* (Bologna: il Mulino, 2021), 209; D. Di Sabato and G. Alfano, ‘L’impiego dell’IA per condizionare e valutare le persone tra limitazioni e divieti: qualche considerazione critica sulla proposta di Regolamento sull’IA elaborata dalla Commissione europea’ *Rivista di diritto dell’impresa*, 281, 289 (2022).

⁸⁰ M. Rabitti, ‘Credit scoring via machine learning’ n 74 above, 179-180.

⁸¹ R. De Chiara, ‘Commento sub art. 124-bis’, in *Commentario al Testo Unico delle Leggi in materia bancaria e creditizia*, III, directed by F. Capriglione (Padova: CEDAM, 4th ed, 2018), 2160.

⁸² G.L. Greco, ‘Credit scoring 5.0, tra Artificial Intelligence Act e Testo Unico Bancario’ *Rivista trimestrale di diritto dell’economia*, 79 (2021).

⁸³ Depending on the specific design of the scoring software, information relating to purchase choices in virtual marketplaces, digital interactions through social media or even geo-localisation may

and *Hard-Data*, which relates to the economic and financial profile of the applicant, already fully accessible to financial intermediaries.

As it has been consistently observed, the use of Artificial Intelligence in this specific market segment offers at least two significant advantages. First, since the new models collect and utilize a larger volume of information, even allowing access to data pools that are typically not accessible,⁸⁴ Artificial Intelligence can facilitate more detailed and comprehensive analyses. In other words, from the perspective of financial institutions, algorithmic *credit scoring*, which also benefits from the ability to process millions of operations per second, can undoubtedly create conditions for a more accurate profile of potential clients,⁸⁵ thus ensuring a system that is less exposed to risks and it is more efficient.⁸⁶ Secondly, from the clients' perspective, the use of a tailored profiling approach, combining *Soft-Data* and *Hard-Data*, can create greater opportunities for financial inclusion⁸⁷ and access to credit for individuals who, due to insufficient credit history, would otherwise be excluded under more traditional evaluation methods.⁸⁸

Nevertheless, as in the case of civil liability, the potential benefits in this domain are not without their associated risks. Specifically, the adoption of innovative methods in *credit scoring* – particularly when, in the absence of adequate regulatory frameworks, it merely mirrors the rapid pace of technological advancement – can give rise to issues that are not easily resolved, at least from three key perspectives.

A primary concern clearly emerges in the realm of privacy,⁸⁹ given that

be relevant. So much so that, in doctrine, there is an extremely lively debate on the doubts as to the legitimacy of the control/profiling activity of the customer: A. Davola, *Algoritmi decisionali e trasparenza bancaria* (Milano: UTET, 2020), 138; D. Di Sabato and G. Alfano, n 79 above, 292; with specific reference to the insurance sector, P. Manes, 'Credit scoring assicurativo, Machine learning e profilo di rischio: nuove prospettive' *Contratto e impresa*, 469 (2021); E. Giorgini, 'Profilazione automatizzata e contratto assicurativo' *Assicurazioni*, 751 (2024).

⁸⁴ In this regard, part of the doctrine tends to speak of a true 'algocracy', A. Aneesh, *Virtual Migration: The Programming of Globalisation* (Durham, NC: Duke University Press, 2006), *passim*.

⁸⁵ F. Mattassoglio, *Algoritmi e regolazione: mito o realtà*, in A. Antonucci et al eds, *I luoghi dell'economia. Le dimensioni della sovranità* (Torino: Giappichelli Editore, 2019), 57; R. Lener, n 73 above, 199; A. Blandini and M. Gigliotti, 'Fintech e innovazione digitale, prospettive applicative nella liquidazione coatta amministrativa' *Banca borsa titoli di credito*, 711 (2024).

⁸⁶ L. Ammannati and G.L. Greco, 'Piattaforme digitali' n 78 above, 292 s.

⁸⁷ A. Mendola, *Diritto all'abitazione e credit scoring. Profili di diritto interno e comparato* (Milano: Wolters Kluwer, 2024), 167

⁸⁸ M. Rabitti, 'Credit scoring' n 74 above, 183; K. Langenbucher and P. Corcoran, 'Responsible AI Credit Scoring – A Lesson from Upstart.com', in E. Avgouleas and H. Marjosola eds, *Digital Finance in Europe: Law, Regulation, and Governance* (Berlin/Boston: De Gruyter, 2022), 168.

For more insights on the application side, see the reflections in the survey conducted by E. Bonaccorsi di Patti, F. Calabresi, B. De Varti, F. Federico, M. Affinito, M. Antolini, F. Lorzio, S. Marchetti, I. Masiani, M. Moscatelli, F. Privitera e G. Rinna, 'Intelligenza artificiale nel credit scoring: analisi di alcune esperienze nel sistema finanziario italiano', in *Questioni Economia e Finanza*, 721, 12 ottobre 2022, available at <https://tinyurl.com/mhdmb8es> (last visited 31 January 2026).

⁸⁹ A. Morace Pinelli, 'La circolazione dei dati personali tra tutela della persona, contratto e mercato' *Nuova giurisprudenza civile commentata*, 1322 (2022); V. Ricciuto, *L'equivoco della privacy. Persona vs dato personale* (Napoli: Edizioni Scientifiche Italiane, 2022), 11, 57, 137; E.

extensive collection of data is often conducted without the full awareness or truly informed consent of the client.⁹⁰ This results in a comprehensive *exposure* of the individual's circumstances. Beyond raising issues regarding the accuracy of the data, this also carries significant implications for confidentiality, particularly in terms of protecting sensitive information, as well as for the management of an ongoing stream of data that, when aggregated and analyzed,⁹¹ can disclose deeply personal details that would have remained undisclosed under traditional methods.⁹²

Additionally, a second concern arises regarding the treatment of clients,⁹³ as algorithmic models may disproportionately affect certain categories of users such as retirees, single-income households, or ethnic minorities. As a result, individuals in these groups could be exposed to increased costs of the service or even its denial. Specifically, assuming that, in most cases, the analysis and processing of a large volume of data proportionally increase the risk of errors due to biases⁹⁴ – whether resulting from the use of inadequate *datasets* or inherent flaws in the algorithm's design, or those introduced through the system's autonomous processing operationally⁹⁵ –, on an operational level, responses provided to each client reflect outcomes potentially compromised from the outset by forms of inequity and discrimination. These may be more or less apparent depending on the fact that the vast amount of data processed can perpetuate social prejudices.⁹⁶ As insightfully pointed out, for the system to be fully functional and reliable, it would require such constant updates that it could be considered a true reflection of 'contemporary reality'. Conversely, every aggregated piece of data, 'trapping information in the past',⁹⁷

Tosi, 'Circolazione contrattuale dei dati personali tra GDPR e nuovo codice del consumo' *Diritto dell'informazione e dell'informatica*, 189 (2023).

⁹⁰ K. Langenbucher and P. Corcoran, n 88 above, 162.

⁹¹ C. Perlingieri, *Creazione e circolazione del bene prodotto dal trattamento algoritmico dei dati*, in P. Perlingieri, S. Giova and I. Prisco eds, *Il trattamento algoritmico* n 16 above, 177, 180.

⁹² With specific regard to the problem of manipulation of information, resulting in violation of pluralism of information, C. Perlingieri, 'Libertà di espressione e di informazione nella comunicazione digitale' *Rassegna di diritto civile*, 494, 507 (2023).

⁹³ C. O'Neil, *Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy* (New York: Crown Pub, 2016), 167; F. Ferretti, 'Consumer access to capital in the age of FinTech and big data: The limits of EU law' 25 *Maastricht Journal of European and Comparative Law*, 490 (2018); M. Rabitti, 'Discriminazioni tecnologiche e Fin-Tech' *Rivista di diritto dell'impresa*, 467 (2023).

⁹⁴ D. Di Sabato and G. Alfano, n 79 above, 294; M. Pellegrini, 'L'intelligenza artificiale nell'organizzazione bancaria: quali sfide per il regolatore?' *Rivista trimestrale di diritto dell'economia*, 422, 429 (2021).

⁹⁵ A. Davola, n 83 above, 149; K. Langenbucher, 'Consumer Credit in The Age of AI – Beyond Anti-Discrimination Law' *ECGI Law Working Paper*, no 663/2022, February 2023, available at <https://tinyurl.com/mrxftc2c> (last visited 31 January 2026).

⁹⁶ D. Di Sabato and G. Alfano, n 79 above, 293. For an examination of the reasons behind the most common unequal treatment of D. Rossano, 'L'Intelligenza Artificiale: ruolo e responsabilità dell'uomo nei processi applicativi (alcune recenti proposte normative)' *Rivista trimestrale di diritto dell'economia*, 212 (2021).

⁹⁷ G. Carapezza Figlia, n 67 above, 639; P. Perlingieri, *Diritto civile* n 36 above, 136.

This profile has been analysed repeatedly in doctrine. Among all, E. Pariser, *The Filter Bubble*:

‘inevitably carries with it the residues of potentially discriminatory biases’, closely tied to the *scripts* assigned to algorithms ‘that, in their drive to maximize performance, often end up structurally excluding minorities’.⁹⁸

Finally, another critical issue is the limited comprehensibility of the mechanisms underlying algorithmic systems.⁹⁹ As it is intuitively apparent, opacity is one of the key concerns raised by Artificial Intelligence in this sector, given the complexity – and in some cases, the near impossibility – of penetrating the logic behind the *black box*¹⁰⁰ functionality. This highlights a problem related to the structure of the algorithm, or more precisely, the assessment of the correctness and effectiveness of the methodologies used in its design.¹⁰¹ On the other hand, the lack of adequate measures to ensure the full *explainability* of the system leaves the client powerless, overwhelmed by the sheer number of variables involved in the evaluation process and the inherent opacity of the underlying logic. It is precisely this lack of algorithmic transparency that places the burden on the rights holder to provide a clear explanation of the credit decision. This issue is so pressing that the *Privacy* Authority itself has stepped in with a series of corrective measures¹⁰² primarily aimed at ensuring that whenever personal data are processed through automated scoring systems, the statistical analysis factors and the algorithms used to calculate outcomes are periodically reviewed – at least every two years – and updated based on the findings of these reviews. The complexity of the matter makes any attempt at comprehensive regulation¹⁰³ particularly challenging. It is enough to recall that, following the well-known Uber controversy,¹⁰⁴ it quickly became apparent that one of the main

What The Internet Is Hiding From You (New York: Penguin, 2011).

⁹⁸ M. Rabitti, ‘Credit scoring’ n 74 above, 185, discusses ‘historical bias’; N. Abriani, ‘Discriminazioni tecnologiche e diritto delle imprese: alla ricerca di strumenti di riequilibrio’ *Rivista di diritto dell’impresa*, 452 (2023); G. Carapezza Figlia, n 67 above, 640.

⁹⁹ M.S.A. Lee and L. Floridi, ‘Algorithmic Fairness in Mortgage Lending: from Absolute Conditions to Relational Trade-offs’ 31 *Minds & Machine*, 167-170 (2021).

¹⁰⁰ J. Kaplan, *Artificial Intelligence: What Everyone Needs to Know* (New York: Oxford University Press, 2016), 113; E. Pellicchia, n 63 above, 1223; J. Pearl, ‘The limitations of opaque learning machines’, in J. Brockman ed, *Possible Minds. 25 Ways of Looking at AI* (New York: Penguin Press, 2019), 19; M.T. Paracampo, ‘FinTech tra algoritmi, trasparenza e algo-governance’ *Diritto della banca e del mercato finanziario*, 220, 237 (2019).

With respect to the risks of using forms of bias as data, see L. D’Avack, ‘La rivoluzione tecnologica e la nuova era digitale: problemi etici’, in U. Ruffolo ed, *Intelligenza artificiale. Il diritto, i diritti, l’etica* (Milano: Giuffrè, 2020), 6; A.M. Gambino and M. Manzi, ‘L’intelligenza artificiale tra protezione del consumatore e tutela della concorrenza’, *ibid*, 333; R. Bichi, ‘Intelligenza digitale, giurimetria, giustizia predittiva e algoritmo decisorio. *Machina sapiens* e il controllo sulla giurisdizione’, *ibid*, 438.

¹⁰¹ R. Magliano, ‘Dall’iperonio Fintech all’iponimo Robo advisor: ricognizione dei rischi e delle opportunità per il “consumatore” di strumenti finanziari’, in E. Corapi and R. Lener eds, *I diversi settori del Fintech. Problemi e prospettive* (Milano: CEDAM, 2019), 190.

¹⁰² <https://tinyurl.com/35zhftnm> (last visited 31 January 2026).

¹⁰³ L. Ammannati and G.L. Greco, ‘Piattaforme digitali’ n 78 above, 314.

¹⁰⁴ The doctrine on the subject is extremely vast. Among all, M.R. Nuccio, ‘Le metamorfosi del trasporto non di linea: il caso Uber’ *Rassegna di diritto civile*, 588 (2017); A. Quarta, ‘Il ruolo delle piattaforme digitali nell’economia collaborativa’ *Contratto e impresa/Europa*, 554 (2017); M. Midiri, ‘Nuove tecnologie e regolazione: il caso Uber’ *Rivista trimestrale di diritto pubblico*, 1017

difficulties in Fintech legislation lies in defining its scope, which may either focus on the platforms or on the algorithms that underpin them.¹⁰⁵

However, even in this case, pending specific and detailed regulation, the value framework promoted at the European level can be useful, if not at least from a *de iure condendo* perspective, by setting out a series of guiding principles that can ensure the robustness of algorithmic *credit scoring* within the system.¹⁰⁶

First and foremost, it would be advisable to adopt guidelines for the use of new technologies in the financial sector,¹⁰⁷ ensuring their broad applicability to all credit institutions, with the clear aim of promoting high *standards* in terms of consumer outcomes regarding the decision-making process. In this context, the issue of data quality could become especially central, not only based on the now legally established principle that creditworthiness must be assessed using relevant and accurate information about income, expenses, and the consumer's economic and financial situation, but also – perhaps more importantly – in relation to the sources of such data. In fact, Directive (EU) 2023/2225 on consumer credit agreements,¹⁰⁸ by addressing a series of ambiguities related to the classification of *Soft-Data* and *Hard-Data*, explicitly clarifies that the information in question cannot include ‘*special categories of data as defined in Article 9, paragraph 1, of Regulation (EU) 2016/679*’; at the same time, it can only be extracted from ‘*relevant internal or external sources [...] and, where necessary, based on a consultation of a database as outlined in Article 19 of this Directive*’.¹⁰⁹ with the explicit clarification that ‘*social networks are not considered an external source*’.¹¹⁰

Secondly, as noted in the context of civil liability, the explainability of the mechanisms underlying algorithmic activity becomes more essential than ever in this sector. Specifically, from a transparency perspective, it is necessary to uncover the internal logic of automated decision-making structures,¹¹¹ in order to understand how obligations towards *stakeholders* are calibrated according to the different contexts in which the activity may be applied. From a regulatory standpoint, once again, efforts are made to address this issue with Directive (EU) 2023/2225, which clarifies that whenever creditworthiness assessment involves automated processing,

‘the consumer should have *the right to receive a meaningful and*

(2018); A. Cocco, *I rapporti contrattuali nell'economia della condivisione* (Napoli: Edizioni Scientifiche Italiane, 2020).

¹⁰⁵ R. Lener, n 73 above, 204.

¹⁰⁶ L. Ammannati and G.L. Greco, ‘Il credit scoring “intelligente” ’ n 73 above, 461.

¹⁰⁷ C. Rinaldo, ‘Il credit scoring’, in M. Cian and C. Sandei eds, *Diritto del Fintech* (Padova: CEDAM, 2024), 451.

¹⁰⁸ <https://tinyurl.com/h7wphbcz> (last visited 31 January 2026).

¹⁰⁹ Direttiva UE 2023/2225, art. 18, comma 3 (our italics).

¹¹⁰ In line with what was already provided for in the Proposal for a Directive of the European Parliament and of the Council on Consumer Credit of 30 June 2021 available at <https://eur-lex.europa.eu>. Cf considerando no 47, 25.

¹¹¹ A.G. Grasso, ‘Decisioni automatizzate e merito creditizio: la Corte di giustizia sul credit scoring’ *Banca borsa e titoli di credito*, 730 (2024).

understandable explanation of the assessment made and the functioning of the automated processing applied, including the main variables, logic, and inherent risks, as well as the right to express their opinion and request a review of the creditworthiness assessment and the decision regarding credit approval.¹¹²

V. Concluding Remarks

In conclusion, the sectors examined contribute, perhaps more decisively than others, to providing a truly comprehensive picture of the potential and risks of algorithmic activity in the digital landscape. In this context, the path forward – though partially sketched out by fluctuating regulatory attempts – must be firmly grounded in the values upon which legal civilization has gradually evolved. Only in this way can we fully understand the ‘shift in pace’ brought about by Artificial Intelligence, framing this profound revolution within an appropriate context,¹¹³ aligned with the unwavering recognition of the centrality of the human person.¹¹⁴ This demands that every phenomenon in social reality be interpreted exclusively through the lens of the principles enshrined in the Constitution and in European and international legislation.¹¹⁵

From this perspective, as highlighted, it is undeniable that the transformations driven by technology and their implementations – particularly through algorithmic processes – offer significant practical benefits in terms of efficiency, accuracy, and personalization. However, it is equally true that, in the name of this progress, many of the hard-won achievements over time run the daily risk of being sacrificed.¹¹⁶ In such circumstances, taking a path insufficiently anchored in fundamental principles not only entrenches and exacerbates existing inequalities, but also fosters new forms of discrimination¹¹⁷ and social exclusion. In practice, algorithms can enable a form

¹¹² Cf. Direttiva UE 2023/2225, considerando no 56, 10, (our italics). Cf. previously, Proposal for a Directive of the European Parliament and of the Council on Consumer Credit of 30 June 2021, considerando no 48.

¹¹³ A. Alpini, ‘Sull’approccio umanocentrico all’intelligenza artificiale’ n 18 above, 5.

¹¹⁴ P. Perlingieri, *Il diritto civile nella legalità costituzionale secondo il sistema italo-europeo delle fonti*, III, *Situazioni soggettive* (Napoli: Edizioni Scientifiche Italiane, 4th ed, 2020), 1; but previously Id, *La persona e i suoi diritti. Problemi del diritto civile* (Napoli: Edizioni Scientifiche Italiane, 2020), 3; as well as Id, *La personalità umana nell’ordinamento giuridico* (Camerino-Napoli: Edizioni Scientifiche Italiane, 1972), *passim*.

¹¹⁵ P. Perlingieri, ‘Complessità e unitarietà dell’ordinamento giuridico vigente’ *Rassegna di diritto civile*, 188 (2005); Id, ‘I valori e il sistema ordinamentale “aperto”’ *ibid*, 1 (2014); Id, ‘Principio personalista, dignità umana e rapporti civili’ *Annali SISDiC*, 1 (2020).

On the relationship between domestic law and European and international sources, in the light of a necessary harmonisation, P. Perlingieri, ‘Sulla «interazione» tra diritto europeo e diritto nazionale’ *Teoria e prassi del diritto*, 385 (2024).

¹¹⁶ S. Pietropaoli, n 65 above, 26.

¹¹⁷ V. Barone, ‘La discriminazione ai tempi dell’intelligenza artificiale. La questione algoritmica’, in T. Casadei and S. Pietropaoli eds, *Diritto e tecnologie informatiche* (Padova: CEDAM, 2024), 285.

of control that is both subtle and pervasive, embedded within the intricate dynamics of economic and social relations.¹¹⁸ To such a degree that human autonomy – and, more broadly, individual freedom – may be severely compromised¹¹⁹ within a democratic process that is already facing significant challenges.¹²⁰ As is increasingly evident, the issue acquires even more complex and sensitive dimensions when it begins to exert a tangible impact on social systems and institutional structures.¹²¹ It is no coincidence, then, that the European Regulation places particular emphasis on the element that most profoundly threatens the foundations of democratic values. Now more than ever, a conscious and well-governed use of emerging technologies is imperative, a necessary precondition for fully leveraging their potential and aligning them meaningfully with the needs and values of the broader system.

‘In the face of the emerging technological domain’ a significant and ‘complex challenge arises regarding the balance between freedom and authority’¹²² which is increasingly taking on a global dimension.¹²³ In this framework, the jurist is entrusted with the daunting task of understanding the profound implications of the ongoing transformations,¹²⁴ while bearing the considerable responsibility of managing them in harmony with the core value system,¹²⁵ through a constant assessment of the adequacy of traditional legal categories in addressing the evolving demands of the technological context.¹²⁶ In this regard, only the preservation of the personalistic foundation of European constitutionalism can effectively counter the all-encompassing threat posed by technological fundamentalism and the subsequent dominance of Artificial Intelligence over humanity.¹²⁷

¹¹⁸ R. Bodei, *Dominio e sottomissione. Schiavi, animali, macchine, Intelligenza Artificiale* (Bologna: il Mulino, 2019), 19, 22; S. Pietropaoli, n 65 above, 29.

¹¹⁹ B. Stiegler, *La miseria simbolica* (Milano: Meltemi, 2021), *passim*; L. Floridi, *Etica* n 10 above, 306.

¹²⁰ G. Resta, ‘Cosa c’è di europeo nella proposta di regolamento UE sull’intelligenza artificiale?’ *Diritto dell’informazione e dell’informatica*, 342 (2022).

¹²¹ B. Romano, n 1 above, XVI.

¹²² T.E. Frosini, ‘Le sfide attuali del diritto ai dati personali’, in S. Faro et al eds, *Dati e algoritmi* n 16 above, 35; P. Perlingieri, ‘Struttura algoritmica e interpretazione’ *Tecnologie e diritto*, 484 (2020); A. Alpini, ‘L’impatto delle nuove tecnologie sul diritto’ *ComparazioneDirittoCivile.it*, 11 (2018).

¹²³ C. Perlingieri, ‘Libertà di espressione’ n 92 above, 498-499.

¹²⁴ N. Abriani, n 98 above, 447.

¹²⁵ On the necessary inclusiveness of the system and its ability to adapt to the plurality of sources, different concrete situations, culture and people’s needs, while respecting fundamental principles, G. Perlingieri, ‘La via alternativa alle teorie del «diritto naturale» e del «positivismo giuridico inclusivo» ed «esclusivo». Leggendo Wil J. Waluchow’ *Annali SISDiC*, 69 (2020).

¹²⁶ A. Alpini, ‘Sull’approccio umanocentrico all’intelligenza artificiale’ n 18 above, 3.

¹²⁷ P. Perlingieri, ‘Sul trattamento algoritmico dei dati’ n 42 above, 192; C. Perlingieri, ‘Libertà di espressione’ n 92 above, 512.