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PARADIGM SHIFT IN CIVIL JUSTICE IN LIGHT OF TECHNOLOGICAL INNOVATION BETWEEN THE EUROPEAN UNION, THE USA, AND CHINA

Abstract

This article will address the transformation of the paradigm of civil justice that is happening both in the European Union and in other international legal systems in light of technological innovation. I refer to the phenomenon of so-called predictive justice.

The objectives of this paper will be twofold.

The first is to check how and to what extent this paradigm shift is taking place. To this end, I will start by showing some studies carried out by the European Commission and then move on to analyse the use of predictive justice tools in select European countries (Italy, France, Estonia, the Netherlands, and Great Britain). Finally, from an intercontinental comparative point of view, I will analyse the use of those digital tools in other legal systems: China and the US.

The second objective, in light of the Italian legal system, is, on the one hand, to propose some possible practical uses of predictive justice tools and, on the other hand, to analyse their limits.

JEL CLASSIFICATION: K13, K41

SUMMARY

1 Social phenomena and changes in legal categories

It is not a new thing to say that the digital transition is revolutionising, among the many sectors, even the legal one.

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The disruptiveness with which technological systems promise to change the field of law suggests a paradigm shift[1], especially when we talk about predictive justice systems. I'm referring to those devices which, using an appropriately representative dataset, are able to formulate the same response as a human decision-maker would give in the same case.[2]

Predictive justice is a phenomenon that reveals a distortion of the current legal procedural categories and the digital phenomena that are emerging.

In fact, it is not the first time that faced with changes in the economic and social context, the concept of the legal category has changed too. For example, similar transformations happened in the transition between Kant's agricultural Germany[3] and Hegel's industrialised Germany[4] following the first industrial revolution, which deeply affected the elaboration of the legal category of property rights. Indeed, the comparison between the Kantian[5] and Hegelian[6] conceptions of the legal category shows a paradigm

[1] See Antonio Carratta, '*Decisione robotica e valori del processo*' (2021) 22(2) Revista Eletrônica de Direito Processual <www.e-publicacoes.uerj.br/index.php/redp/article/view/59558/37720> accessed 18 June 2023; Antonio Punzi, *L'ordine giuridico delle macchine* (Giappichelli 2003).

[2] The Compass tool (Correctional offender management profiling for alternative sanctions) is famous in the United States. Compass is an artificial intelligence tool—mostly used in the states of Wisconsin, Michigan and Florida—used to calculate the risk of recidivism for a subject on the basis of certain variables, such as criminal records, personal attitudes, family structure, social exclusion, lifestyle and the personality of the subject.

[3] 18th century Germany was described by historians as a country that tended to lag behind other European states, for both geographical and sociopolitical reasons. For these considerations see Heinz Schilling, *Ascesa e crisi. La Germania dal 1517 al 1648* (Il Mulino 1997); Heinz Schilling, *Corti e alleanze. La Germania dal 1648 al 1763* (Il Mulino 1999); Tom Kemp, *L'industrializzazione in Europa nell'800* (Il Mulino 1997).

[4] From the second half of the eighteenth century, when Hegel was born and raised, there was a change in judicial trends. These are the years in which the concept of work changed radically thanks to exponential growth in industrial development. The ways of working were radically transformed and the work became more repetitive, specialised and mechanised by economic sector. In this context, see the studies carry out by Adam Smith, *An Inquiry into the Nature and Causes of the Wealth of Nations* (first published 1776, The University of Chicago Press 1977); David Ricardo, *Principi di economia politica e dell'imposta* (Anna Bagiotti tr, 1st edn, UTET 2006); Karl Marx, *Il Capitale* (first published 1867, Bruno Maffi tr, UTET 2017). On the influence of these authors in Hegelian thought see Remo Bodei, 'Studi sul pensiero politico ed economico di Hegel nell'ultimo trentennio' (1972) 27(4) Rivista Critica di Storia della Filosofia 435.

[5] In the work "Metafisica dei costumi" and in the "Introduzione alla dottrina del diritto §B", Kant writes that rights are the set of conditions under which the will of each agrees with the will of others according to a universal law of freedom. See Immanuel Kant, *La metafisica dei costumi* (first published 1797, Giovanni Vidari tr, Laterza 2009). Suffice it to very briefly mention here, since this is not the place for a comprehensive discussion that the construction of the Kantian juridical category seems to be elaborated in a purely individual key. In fact, in the work just cited, the arbitrary desires of the single individual are elevated to where the system and the juridical category constructed on it both hinge on it. This arbitrary right, however, must not be exercised indiscriminately but is limited by what Kant defines as a categorical imperative, a system of universally recognised moral values.
Also, this system of values (the categorical imperative), which should represent the universal law, finds its foundation, like the will of the individual, in human reason: it should derive from an individual consciousness, from a single subjective determination, an abstract universal law valid for all.

[6] In the work "Lineamenti di filosofia del diritto" the legal category that Hegel proposes reflects some aspects that the author contains within the moment of "morality" (§§ 105-141) and "ethics" (§§ 142–360). See G W F Hegel, *Lineamenti di filosofia del diritto* (first published 1820, Barbara Henry tr, Laterza 2006).
The mutual interdependence between the individual and civil society that emerges from the Hegelian work highlights the change in the economic and social substrate of the time. It is in fact interesting to note that the change in the legal category went hand in hand with the geopolitical and industrial evolution of the country and was also influenced by the classical economic school to which Hegel was drawn. See Remo Bodei, 'Studi sul pensiero politico ed economico di Hegel nell'ultimo trentennio' (1972) 27(4) Rivista Critica di Storia della Filosofia 435; Fulvia De Luise, Giuseppe Farinetti, *Lezioni di Storia della Filosofia* (Zanichelli 2012) 36.

shift that was influenced by the different historical contexts in which Kantian Germany, on the one hand, and Hegelian Germany, on the other, were placed.

A similar phenomenon is occurring in the European context with the continuous development of artificial intelligence tools. In fact, technological developments are delineating a change in the paradigm of civil justice, just as industrialisation allowed a different definition of legal categories in Hegelian Germany.

The example of the Kantian and Hegelian legal categories is only one of the many examples that shows how the social structure and the values embedded in it are able to change existing legal categories and generate new ones.[7]

A similar phenomenon has also occurred in China. In recent years, civil procedural law has undergone significant development following the transition from the Confucian tradition (in which litigation was perceived as the failure of an obligation to maintain social harmony) to the adoption of Western-style jurisdictional models.[8]

In more general terms, economic, productive, and social changes require the adaptation of the legal system through its reformulation to ensure that it is able to faithfully reflect the new social dynamics and, above all, to protect the new emerging (legal) categories that demand recognition.[9]

One recurring aspect that shows the concerns related to the use of artificial intelligence systems is the potential prejudice against fundamental human rights (in this regard, the development of the legal category of neurorights is exemplary).[10]

[7] I'm referring to neurorights. On the point see note 10.

[8] On these terms see: Mario Libertini, Maria Rosaria Maugeri, Enzo Vincenti, 'Intelligenza artificiale e giurisdizione ordinaria. Una ricognizione delle esperienze in corso' in Alessandro Pajno, Filippo Donati e Antonio Perrucci (eds), *Intelligenza artificiale e diritto: una rivoluzione?,* vol 2 (Il Mulino 2022).

[9] Some examples are the regulation in a single body of consumer rights (d. lgs. n.206/2005, consumer code) in order to ensure adequate protection of consumers against legal entities that are in a dominant position; the regulation of civil unions (d. lgs. n.76/2016); the regulation of workers' rights (l. n.300/1970) following requests for protection in the workplace; the will to enclose in a legislative text (Commission, 'Proposal for a Regulation of the European Parliament and of the Council laying down harmonised rules on artificial intelligence (Artificial Intelligence Act) and amending certain Union legislative acts' COM (2021) 206 final (hereinafter, 'AI Act') the rules governing the placing on the market and use of artificial intelligence.

[10] For a related argument, see Marcello Ienca, 'Tra cervelli e macchine: riflessioni su neurotecnologie e su neurodiritti' (2019) 133 Notizie di Politeia 52; Gaetana Natale, 'Intelligenza artificiale, neuroscienze, algoritmi: le sfide future per il giurista' (2021) 4 Rassegna Avvocatura dello Stato 116; Oreste Pollicino, 'Costituzionalismo, privacy e neurodiritti' (2021) 2 MediaLaw 9 <www.medialaws.eu/rivista/costituzionalismo-privacy-e-neurodiritti/> accessed 22 June 2023. With regard to this category of emerging rights, in 2021 Chile proposed to become the first state in the world to include the protection of neurorights in the constitution. A law of constitutional reform, among various and additional objectives, also set out to give recognition and offer protection for neurorights. An amendment of Art. 9 of the Constitution was proposed with the addition of the following statement: "Scientific and technological development will be at the service of people and will be carried out with respect for life and physical and mental integrity. The law will regulate the requirements, conditions and restrictions for its use by people, and must especially protect brain activity, as well as the information from it". However, in 2022 the constitutional reform text was not approved. More generally on the Chilean path toward constitutional reform see Tania Groppi, Elena Bindi, Andrea Pisaneschi, 'Il Cile verso la Convenzione costituzionale' (2021) 1 DPCE online <www.dpceonline.it/index.php/dpceonline/article/view/1319> accessed 22 June 2023; Tania Groppi, 'Il Cile da un "plebiscito" all'altro. Il rechazo del nuovo testo costituzionale nel referendum del 4 settembre 2022, visto dall'Italia' (2022) 23 Federalismi <https://www.federalismi.it/nv14/editoriale.cfm?eid=645&content=&content_auth=> accessed 22 June 2023.

In fact, from a strictly legal point of view, what clearly differentiates the elaboration of past theories with modern approaches to artificial intelligence tools is the increasing attention that institutions and researchers place on fundamental rights. This has also happened in the study of justice.[11]

In general, the use of digital tools in jurisdictional activity leads to a different connotation of jurisdiction, so much so that the phenomenon has taken the name "digital justice".

In the Italian legal system, this term is also reflected in positive law. The d.lgs n.149/2022 (Cartabia reform) introduced in the implementing provisions of the Code of Civil Procedural Law the Title V ter, entitled "Provisions relating to digital justice".

However, this title contains provisions that refer to a phenomenon with a much more limited scope than the phenomenon of predictive justice. In fact, those rules concern aspects relating to the digitalisation of acts, and they have nothing to do with decision-making artificial intelligence systems.

In any case, the reference to "digital justice" seems to be a timid hint of the Italian legislature's interest in the digital phenomenon. Indeed, the legislature may not be too shy given that the term "digital justice" evokes scenarios that suggest a significant technological advance in the field of justice. Our imagined applications, however, are reframed after we read the provisions, which refer to the simplest issues related to the drafting of acts in a digital format and the transformation of analogic acts into a digital format.[12]

However, the idea of applying artificial intelligence tools in the context of jurisdictional activity has raised heated debates[13] around ethical-legal issues. In fact, on the one hand, there are some extreme theses[14] that predict an apocalyptic technological scenario, and on the other hand, there are more moderate ones[15] that exclude a dystopian future in which knowledge of the law and its application will fall under the monopoly of machines. In the middle, there is the "third way"[16] that is adopted by the European Union in the

[11] In this regard, the precursor document is the "European Ethical Charter on the use of artificial intelligence in judicial systems and their environment" adopted by CEPEJ on 3-4 December 2018.

[12] See da Antonio Carratta (n 1).

[13] See Amedeo Santosuosso, Giovanni Sartor 'La giustizia predittiva: una visione realistica' (2022) 7 Giurisprudenza italiana 1760. The first pages of the text, making an analysis around the "*illusions, hopes and fears*" of prediction and algorithmic decisions, offer an effective reconstruction of the feelings generated by the idea of artificial intelligence applied to the field of justice.

[14] See Roberto Bichi, 'Intelligenza digitale, giurmetria, giustizia predittiva e algoritmo decisorio. Machina sapiens e il controllo sulla giurisdizione' in Ugo Ruffolo (ed), *Intelligenza artificiale. Il diritto, i diritti, l'etica* (Giuffrè Francis Lefebvre 2020) 423; Massimo Luciani, 'La decisione giudiziaria robotica' (2018) 3 AIC <www.rivistaaic.it/it/rivista/ultimi-contributi-pubblicati/massimo-luciani/la-decisione-giudiziaria-robotica> accessed 22 June 2023.

[15] See Amedeo Santosuosso, Giovanni Sartor (n. 13); Floris Bex, Henry Prakken, 'On the relevance of algorithmic decision predictors for judicial decision-making', [2021] ICAIL <https://dl.acm.org/doi/abs/10.1145/3462757.3466069> accessed 28 June 2023; Max Tegmark, *Vita 3.0. Essere umani nell'era dell'intelligenza artificiale* (Virginia B. Sala tr, Rafaello Cortina Editore 2018).

[16] See Filomena Santagada, 'Intelligenza artificiale e processo civile' in Rosaria Giordano and others (eds), *Il diritto nell'era digitale. Persona, Mercato, Amministrazione, Giustizia* (Giuffrè Francis Lefebvre 2022); Antonio Punzi, 'Judge

proposal for a European regulation on artificial intelligence (AI Act) and that I will discuss in the next section.

2 Studies carried out by the European Commission

The theme of artificial intelligence has been present since 2004 in the research and development programmes of the European Union,[17] which has allocated a large amount of capital for technological development.[18]

The European Union has in fact intensified its efforts to remain competitive in the field of research and technological development: the stated goal[19] is to become an attractive centre for the global market and to avoid falling behind the US and China.[20]

The first strategic guidelines to concretely outline this objective were defined by the European Commission in the communication of 25 April 2018 COM (2018) 237 final, "*Artificial intelligence for Europe*".[21] The guidelines consist of several profiles: i) a properly strategic profile, relating to the concrete actions to establish itself as a market of excellence, ii) a profile relating to cooperation between Member States, iii) a legal profile and, not by chance, iv) a socioeconomic profile.

The profile dedicated to the legal aspects opens with an affirmation that shows the direction that the European Union would then take: "An environment of trust and accountability around the development and use of AI is needed".[22]

Following this objective, in 2018, the European Commission appointed a group of experts—High-Level Expert Group on Artificial Intelligence (HLEG AI)—with the aim of defining ethical guidelines for the design of artificial intelligence tools to ensure an

in the machine. E se fossero le macchine a restituirci l'umanità nel giudicare?' in Alessandra Carleo (ed), *Decisione robotica* (Il Mulino 2019); Antonio Punzi, 'Difettività e giustizia aumentata. L'esperienza giuridica e la sfida per l'umanesimo digitale' (2021) 1 Ars Interpretandi <www.rivisteweb.it/doi/10.7382/100796> accessed 30 June 2023; Edoardo Rulli, 'Giustizia predittiva, intelligenza artificiale e modelli probabilistici. Chi ha paura degli algoritmi?' (2018) 2 Ars Interpretandi <www.rivisteweb.it/doi/10.1433/92116> accessed 30 June 2023. See also Nicola Lettieri, 'Contro la previsione. Tre argomenti per una critica del calcolo predittivo e del suo uso in ambito giuridico' (2021) 1 Ars Interpretandi <www.rivisteweb.it/doi/10.7382/100794> accessed 30 June 2023.

[17] The focus was initially on the robotics sector (2004). Investments in this sector have increased exponentially over the years, reaching up to 700 million euros in the period 2014-2020, in addition to the 2.1 billion euro of private investments in a public-private partnership on robotics. See Commission, Artificial intelligence for Europe (Communication) COM (2018) 237 final.

[18] 95.5 billion euro have been allocated under the "Horizon Europe" programme for the period 2021-2027 and approximately 80 billion euro under the previous "Horizon Europe 2020" programme for the period 2014-2020).

[19] COM (2018) 237 final, 3.

[20] COM (2018) 237 final, 4.

[21] On this communication, the European Economic and Social Committee (EESC) issued its opinion (Comitato Economico e Sociale Europeo, 'Parere del Comitato economico e sociale europeo sulla "Comunicazione della Commissione al Parlamento europeo, al Consiglio europeo, al Comitato economico e sociale europeo e al Comitato delle regioni – L'intelligenza artificiale per l'Europa" (2018/C 440/08) <https://eur-lex.europa.eu/legal-content/IT/TXT/PDF/?uri=CELEX:52018AE2369&from=IT> accessed 30 June 2023).

[22] COM (2018) 237 final, 13.

adequate legal and ethical framework based on the values of the European Union and consistent with the EU Charter of Fundamental Rights.[23]

To fulfil the strategies contained in COM (2018) 237 final, the European Commission subsequently adopted the "*Coordinated plan on artificial intelligence*",[24] accompanied by the annex "*Coordinated plan on the development and use of artificial intelligence 'Made in Europe' – 2018"*[25]: both documents have been approved by the Council of the European Union. While the first provides a general overview of the objectives that the European Union has set itself, the second defines several concrete actions to be implemented at both the European and national levels in the 2019-2020 period.[26]

Another important initiative of the European Commission was the adoption of the white paper on artificial intelligence on 19 February 2020.[27] In this document, the European Commission defined further strategic guidelines for the safe and reliable development of artificial intelligence tools with the aim of defining an "ecosystem of excellence" and an "ecosystem of trust".

The white paper laid the foundations for the future definition of the regulatory framework for artificial intelligence. The European Commission argued that users' full confidence in AI systems was necessary. The risks associated with the use of artificial intelligence equipment had to be eliminated or reduced to a minimum.

With regard to risk management, the white paper shows that the multilevel regulatory system (cd risk-based approach) adopted by the European Commission in the AI Act had already been envisaged by the German Commission on Data Ethics. This German commission had advanced the idea of "a five-level risk-based system of regulation that would go from no regulation for the most innocuous AI systems to a complete ban for the most dangerous ones".[28]

This approach—as mentioned—was adopted in the proposal to regulate artificial intelligence in AI Act.

The AI Act has been subject of a lengthy confrontation between European political forces, which has led to the formulation of thousands of amendments, so much so that the tripart dialogue between European institutions is still in progress.

[23] The High-Level Expert Group on Artificial Intelligence (HLEG AI) developed several documents with the aim of tracing an ethical perimeter within which the design and use of artificial intelligence systems should take place. It thus identified a number of principles (defined ethical imperatives) which should be taken into account: i) respect for human autonomy; ii) prevention of harm; iii) equity; iv) explicability. See High-Level Expert Group on Artificial Intelligence, 'Ethics guidelines for trustworthy AI' (2019) <https://digital-strategy.ec.europa.eu/en/library/ethics-guidelines-trustworthy-ai> accessed 30 June 2023.

[24] Commission, 'Coordinated Plan on artificial intelligence' (Communication) COM (2018) 795 final.

[25] Commission, 'Coordinated plan on the development and use of artificial intelligence "Made in Europe" – 2018' (Communication) COM (2018) 795 final, Annex.

[26] In addition, the coordinated action plan also provided for continuous monitoring of the plan. In 2018, the "AI Watch" project was launched within the Joint Research Centre (JRC) to provide the necessary analyses for the implementation of the European Artificial Intelligence Initiative.

[27] Commission, 'White paper on Artificial Intelligence - A European approach to excellence and trust' (Communication) COM (2020) 65 final.

[28] COM (2020) 65 final, 10.

A compromise position on the proposal presented by the European Commission was not reached until 9 May 2023, when the LIBE committee and the IMCO committee voted on the amendments previously tabled by the various political forces. The new draft was approved by 84 votes to 7 with 12 abstentions.

Finally, on 14 June 2023, the European Parliament voted in favour of the compromise draft, thus devolving the act to the Council of the European Union in an attempt to achieve the adoption of the regulation by the end of 2023.

The compromise draft applies the "risk-based approach": the regulation of AI systems depends on the degree of risk they pose to human rights, and each risk category is subject to a different legal regime. In particular, the compromise draft approved by the European Parliament subdivides the AI systems into five risk categories.

For the purposes of our investigation, the "high-risk AI systems", which include AI systems "intended to be used by a judicial authority or administrative body or on their behalf to assist a judicial authority or administrative body in researching and interpreting facts and the law and in applying the law to a concrete set of facts or used in a similar way in alternative dispute resolution", are relevant (Annex III, paragraph 8, lett. a).

The formulation of this provision inevitably implies an awareness on the part of the European institutions, which is perhaps still lacking in European national legal systems, although not in all.

3 The predictive justice systems in the European landscape

3.1 The state of the art in the Italian legal system

Applying the provision of Annex III, paragraph 8, lett. a) in the Italian context, we observe that it represents the current experience of both the public administration and the judicial offices.

Regarding the experiences of public administration, research carried out in the framework of the PRIN 2017 project "Governance of/through Big Data: Challenge for European law" has shown that in the Italian legal system, AI systems are adopted in a different way[29]. In particular, three different trends have emerged: i) independent authorities are inclined to resort to independent handling and interfunctional collaborations: the programming of AI systems is tailored to their specific needs; ii) smart cities prefer the use of two alternative models: public tender or self-production; and iii) in the central government, however, there is no single trend: the evaluation of the experiences of the INPS, the Revenue Agency and the Ministry of Justice has led to the

[29] See Edoardo Chiti, Barbara Marchetti e Nicoletta Rangone, 'Impiego di sistemi di intelligenza artificiale nelle pubbliche amministrazioni italiane: prove generali' (2022) 2 BioLaw Journal <https://teseo.unitn.it/biolaw/article/view/2351/2296> accessed 2nd July 2023.

affirmation that there are misalignments at the central level regarding the modalities of action.

With reference to the Ministry of Justice, the abovementioned research has shown that the process of digitisation is slow and uneven in the various sectors (civil, criminal and administrative). As a result, this has a negative impact on the possibilities of developing AI systems of predictive justice and putting them into service in the judicial field.

In other public sectors, in recent years, public administration has instead started to use artificial intelligence systems with decision-making functions.[30] One of the sectors that has seen a wide use of this type of tool is the education system.[31] In this field, numerous disputes have emerged because the public offices, using algorithmic decision-making systems, had violated the obligation to always motivate its decisions stated under Art. 3 L. n.241/1990. The disputes thus settled have created an extensive jurisprudence,[32] which has established different principles such as i) the principle of algorithmic nondiscrimination, ii) the principle of nonexclusivity (or the reserve of humanity in the decision) and iii) the principle of comprehensibility-knowability of the decision (that is, the principle that tries to cope with the opacity of the algorithm (so-called "black box") that prevents explaining the logical-argumentative path followed by the software in making the decision.)

With reference to the judicial offices, at the current state of the art, the use of artificial intelligence systems with decision-making functions is not yet recorded. AI systems of this magnitude have not yet been developed. There are, however, numerous projects resulting from agreements concluded between courts on the one hand and universities on the other.

Some examples are presented here.

On 6 April 2018, the University of Brescia, the Ordinary Court of Brescia and the Court of Appeal of Brescia signed the convention "Predictive Justice". The aim of the project is to provide users with information on the foreseeable duration of the trial (regarding the

[30] On this point, see Filippo Donati, 'Intelligenza artificiale e giustizia' in Antonio D'Aloia (ed), *Intelligenza artificiale e diritto. Come regolare un mondo nuovo* (Franco Angeli 2020) 248; Silvia Sassi, 'Gli algoritmi nelle decisioni pubbliche tra trasparenza e responsabilità' (2019) 1 Analisi giuridica dell'economia <https://www.rivisteweb.it/issn/1720-951X/issue/7760> accessed 2 July 2023; Giuliano Avanzini, *Decisioni amministrative e algoritmi informatici. Predeterminazione analisi predittiva e nuove forme di intellegibilità* (Editoriale Scientifica 2020).

[31] The issues concerned the use of software by the Ministry of Education in the context of the procedures for the allocation of seats and the mobility procedures of school staff following the law's entry into force c.d. "buona scuola" (L. n. 107/2015).

We also note the recent pronouncement of T.A.R. Campania, 14 November 2022, n. 7003 relating, instead, to the disputes concerning the use by AGEA (Agency for Agricultural Payments) of an algorithmic instrument for redefining the amounts of certain allowances for which the applicant was a beneficiary.

[32] See T.A.R. Lazio, Sez. III-*bis*, 22 March 2017, n. 3769; T.A.R. Lazio, Sez. III-*bis*, 10 September 2018, nn. 9224-9230; Cons. St.., Sez. VI, 8 April 2019, n. 2270; di T.A.R. Lazio, Sez. III-*bis*, 27 May 2019, n. 6606; Cons. St., Sez. VI, 13 December 2019, nn. 8472-8474; Cons. St., Sez. VI, 4 February 2020, n. 881; T.A.R. Lazio, Sez. III-*bis*, 24 June 2021, n. 7589.

specific subjects covered by the project) and the relevant guidelines of the jurisprudence of the two judicial offices that are parties to the convention.[33]

On 29 September 2021, the Electronic Documentation Centre (CED) at the Court of Cassation and the University Higher School IUSS Pavia signed an agreement with the aim of developing technical tools for the collection and organisation of digital legal material through legal analysis. The stated objectives are i) to predict the outcome of judicial, administrative and political proceedings; ii) to extract the argumentative structures from the body of judicial decisions; iii) to automatically create summaries of the judgments; and iv) to design tools that automatically create documents.

A technologically ambitious project is in place at the Ca' Foscari University of Venice in conjunction with the Court of Appeals of Venice and Unionecamere of Veneto in collaboration with Deloitte, which provides technical support.[34] The aim is to create the first prototype of predictive justice software applied in jurisprudence. In particular, 800 decisions issued in the three-year period 2019-2021 by the Territorial Courts in the district of the Court of Appeals of Venice were analysed. These 800 decisions, issued in the field of dismissal for justified objective reasons, have been labelled to train the algorithm that will be called upon to predict the outcome of a dispute in that matter.

A project of wider territorial scope is "NextGeneration UPP",[35] which involves the Judicial Offices of Macro Area A1[36] and numerous universities.[37]

NextGeneration UPP aims to improve the efficiency and performance of justice in north-western Italy[38]. In particular, the objective is to provide the judicial offices with an efficient method of analysis and management of incoming and outgoing litigation, on the one hand, and to provide the "Ufficio per il Processo" attendants (UPP) with cross-cutting skills, on the other.

The attempt is therefore to strengthen the system of digitisation of the judicial offices through tools for legal analytics, thus creating an interdisciplinary environment in which data science, machine learning and natural language processing activities converge.

[33] The agreement is available at the following link <www.giustizia.brescia.it/allegatinews/A_18592.pdf>. The project has a dedicated, specific area available at the following link https://giustiziapredittiva.unibs.it/

[34] On 14 November 2014, a conference was held at Ca' Foscari University on this project. The interventions are available on the website of the Court of Appeals of Venice at the following link <https://ca-venezia.giustizia.it/giurisprudenza-predittiva_466.html>.

[35] It is a project that is a part of the Piano Operativo Nazionale – Governance e Capacità Istituzionale 2014-2020 (PON) and it is implemented in synergy with the interventions provided by the National Recovery and Resilience Plan (PNRR).

[36] The Courts of Appeals of Brescia, Genoa, Milan and Turin, the ordinary courts of the respective districts and the courts for minors.

[37] The Next Generation UPP, coordinated by the University of Turin, is realised in partnership with the University of Milan Bicocca, the University of Bergamo, the University of Brescia, the University of Genoa, the University of Insubria, the University of Milan, the University of Eastern Piedmont Amedeo Avogadro, the University of Pavia, the University of Advanced Studies of Pavia, the Polytechnic of Milan and the Polytechnic of Turin.

[38] For an in-depth analysis of the lines of intervention, specific actions and objectives and expected results, please refer to the dedicated website of the University of Milan Bicocca, among others, at the following link <https://giurisprudenza.unimib.it/it/ricerca/next-generation-upp> accessed 5 July 2023

Similar to the latter project are those operating in the other macro areas in which the judicial offices are territorially divided.

In particular, in Macro Area 02, we find the Uni4Justice[39] project that has the University of Bologna as its leader; in Macro Area 03, there is the project Giustizia Agile,[40] coordinated by the University of Tuscia; in Macro Area 04, the project MOD-UPP[41] is coordinated by the University of Naples Federico II; in Macro Area 05, the project StartUPP[42] is coordinated by the University of Bari; and, finally, in Macro Area 06, the project JustSmart[43] is coordinated by the University of Palermo.

Like the NextGenerationUPP, these latest projects are also part of the PON in synergy with the activities of the PNRR and have as an objective the efficiency of the justice system through better management of the operating models and workflows.

However, unlike what happened in some other public offices, to date, no judicial office has yet used predictive justice software with decision-making functions, but the existing projects in the various courts and universities suggest that in the near future, we may reach these developments, as happened in other European cases.

We will now see that, from a comparative point of view, the Italian context regarding the use of predictive justice software is lagging behind that of other European states, in which, instead, initiatives of a publicist matrix have been advanced.

Taking a look at the "Artificial Intelligence Strategic Program 2022-2024" developed by the Italian government, we note that the lines of action are still quite general, and although there is some concern over the enhancement of digital structures in the various public administrations, no targeted policy lines involving the use of predictive justice tools have been specifically identified. This, however, is not much of a surprise, since a proper design of such software would necessitate—or at least, would be facilitated by—the preparation of a public database containing (anonymised) measures issued by the judicial authorities, directly fed by the same Ministry of Justice from which you can draw datasets to train software.

3.2 The state of the art in other European countries

In France, pursuing the goal of encouraging innovation and the digital economy, has already promoted the circulation of data with Loi 2016/1321 by establishing the obligation for public administrations to publish online the main documents in their possession of

[39] Please refer to the dedicated site <https://dsg.unibo.it/it/ricerca/progetti-di-ricerca/progetti-nazionali-e-di-ateneo/uni-4-justice> accessed 5 July 2023

[40] Please refer to the dedicated site <https://www.unitus.it/it/unitus/mappatura-della-ricerca/articolo/giustizia-agile> accessed 5 July 2023

[41] Please refer to the dedicated site <http://www.unina.it/-/30852250-nuovo-ufficio-per-il-processo-modelli-organizzativi-e-innovazione-digitale> accessed 5 July 2023

[42] Please refer to the dedicated site <https://www.uniba.it/it/ateneo/rettorato/ufficio-stampa/comunicati-stampa/anno-2022/giustizia-agile> accessed 5 July 2023

[43] Please refer to the dedicated site <https://sites.unica.it/ict4lawforensics/justsmart/> accessed 5 July 2023

economic, social, health and environmental interest. In the area of justice, all judicial decisions have been made public.

While this is certainly favourable for the development of forward-looking justice software, it has raised some concerns.

For the positive aspects, the realisation of some software, such as Predictive, JuriPredis, and Case Law Analytics, must be noted.

Special mention should be made of the DataJust software, which was created following the public initiative taken by the Ministry of Justice, authorised by Decree 2020/356 of 27 March 2020. The goal of DataJust is to carry out an automated processing of data related to settlements in cases with personal damages to realise predictive software for the resolution of new cases.[44]

For the critical aspects, some concerns have rightly arisen in the French legislature regarding both the possible profiling of judges and the profiling of individuals according to their behaviour. Thus, Loi 2019/222 sanctioned a ban on profiling judges, whose violation is subject to a penalty of imprisonment for up to 5 years, and Loi 2018/493 imposed a ban on judicial decisions based on assessments of the behaviour of people obtained through automated processing of data that concern individuals' personalities.[45]

Estonia is a country that is often mentioned when we talk about these issues: a brief look at its context can explain why.

Estonia is a country that has approximately 1.3 million inhabitants, and digitalisation significantly permeates public services. For example, citizens can rely on a digital identity system that allows them to enjoy services such as electronic voting.

More generally, government databases are linked by a system called the X-road that facilitates the exchange of information between public administrations.[46] The latter, therefore, have the possibility of communicating effectively because there is an adequate communication channel.

The sector that interests us is known as an ambitious initiative of the Ministry of Justice, with which it wants to implement artificial intelligence for small claims (the limit set is € 7,000). It is software that is invested in the entire conflict, whose "robotic decision" can be challenged before a human decision-maker.

This is perhaps the most significant project in the field of predictive justice. The ambitious goal is to create a software substitute for the judge, without prejudice to the indispensable right to appeal to a human decision-maker for a possible reform of the digital decision.[47]

[44] On the point, see Giada De Pasquale, 'La giustizia predittiva in Francia: il trattamento di DataJust' [2021] Judicium <www.judicium.it/la-giustizia-predittiva-francia-trattamento-datajust/> accessed 5 July 2023. For some reflections on the different reactions of the forensic profession to private and public initiatives see Mario Libertini, Maria Rosaria Maugeri, Enzo Vincenti (n 8).

[45] See Edoardo Chiti, Barbara Marchetti e Nicoletta Rangone (n 29).

[46] Antonio A Martino, 'Chi teme i giudici robot' (2020) 2 Rivista italiana di informatica e diritto <www.rivistaitalianadiinformaticaediritto.it/index.php/RIID/article/view/58> accessed 27 June 2023.

[47] Antonio A Martino (n 46); Mario Libertini, Maria Rosaria Maugeri, Enzo Vincenti (n 8).

In the Netherlands, as far as we know, there are no predictive justice systems as previously outlined. However, since 2014, an online dispute resolution software (ODR) called Rechtwijzeruit and developed by the University of Twente and Hill (Hague Institute on the Innovation of Law), has been tested, at first limited exclusively to divorce proceedings. In 2017, the platform was redefined and renamed Uitelkaar.nl.

This tool is proposed as an online advice system for private parties who, after having made contact with mediators and lawyers, are followed step by step in the path of their interest (preparation of the divorce plan, the parental plan or both) to see the documents submitted to the court for validation.[48]

Even in the United Kingdom, as far as we know, there are no instruments of predictive justice in the civil sphere. However, mention should be made of the use of risk assessment tools, as is the case in the United States.

The most known application is perhaps the HART software, developed by the University of Cambridge and trained using the data contained in the Durham police archives for the period 2008-2012.[49]

Its operation is based on a particular machine learning model called random forest.[50] Through the analysis of 34 variables—among which there are data on the subject's criminal history, age and gender—we are able to calculate the risk that the arrested person commits further crimes in the following two years.[51]

As with other risk assessment tools used in different jurisdictions (such as the US), the use of HART was not without its critics.[52]

[48] On the point, see Laura Kistemaker, '*Rechtwijzer and Uitelkaar.nl. dutch experiences with ODR for divorce*' (2021) 59 (2) Family Court Review <https://search.informit.org/doi/abs/10.3316/agispt.20210506046114> accessed 2 July 2023.

[49] See Mitja Giualuz, 'Quando la giustizia penale incontra l'intelligenza artificiale: luci e ombre dei risk assessment tools tra stati uniti ed europa' [2019] Diritto Penale Contemporaneo <https://archiviodpc.dirittopenaleuomo.org/d/6702-quando-la-giustizia-penale-incontra-l-intelligenza-artificiale-luci-e-ombre-dei-risk-assessment-too> accessed 2 July 2023; Marion Oswald, Jamie Grace, Sheena Urwin and Geffrey C Barnes, 'Algorithmic risk assessment policing models: lessons from the Durham HART model and "Experimental" proportionality' (2018) 27 (2) Information and Communications Technology Law <www.tandfonline.com/doi/full/10.1080/13600834.2018.1458455> accessed 2 July 2023.

[50] Mitja Giualuz (n 49).

[51] For a more in-depth overview see Mitja Giualuz, (n 49); Marion Oswald, Jamie Grace, Sheena Urwin and Geffrey C. Barnes (n 49).

[52] See Big Brother Watch, 'Big Brother Watch's Written Evidence on algorithms in the Justice System for the Law Society's Technology and the Law Policy Commission' (February 2019) <https://bigbrotherwatch.org.uk/wp-content/uploads/2019/02/Big-Brother-Watch-written-evidence-on-algorithms-in-the-justice-system-for-the-Law-Societys-Technology-and-the-Law-Policy-Commission-Feb-2019.pdf> accessed 10 July 2023. With reference to the criticisms about privacy, see Hannah Couchman, 'Policing by machine. Predictive policing and the Threat to Our Rights' (Liberty, January 2019) <www.libertyhumanrights.org.uk/issue/policing-by-machine/> accessed 10 July 2023.

4 The state of the art in China and in the US

In this section, we will consider the Chinese and US legal systems and see how public initiatives relating to the development of digital justice tools in the civil field are placed at opposite ends.

4.1 Digital justice in China

As mentioned in section 1, in recent years in China, there has been a shift from a Confucian tradition to a more Western-style jurisdictional model. We will argue that these changes have led, on the one hand, to an exponential increase in the number of trials and, on the other hand, to the recognition of significant inadequacies in the Chinese judicial system.[53]

These aspects have emerged in a time when the Chinese territory witnessed remarkable growth in technological development, which contributed to the rise of the so-called 'internet court phenomenon'.

China has embarked on an articulated path to exploit the possible advantages deriving from the use of digital systems since 1990. This path can be mainly divided into three phases.[54] The first (1996-2003) saw a progressive development of the digitalisation of civil trials: it began in 1996 following the National Conference on Matters of Court Communication and Computer, and it saw its conclusion in 2003 when the courts finished the process of digitising the files and their websites.[55]

The second phase (2004-2013) is characterised by the use of devices with internet access to allow the conduct of hearings remotely and to facilitate the exchange of documents between the parties and the court. This development may seem trivial, but given the territorial dimensions of China, the establishment of this practice has made it much easier to carry out trials between parties that are at a significant distance from each other. In addition, to monitor the progress of the trials, in 2009, the Beijing High People's Court built a website to allow online access to the ongoing hearings.[56] In this very context, the creation of a database containing both the legal references and the decisions issued by the courts was also envisaged.[57]

[53] Mario Libertini, Maria Rosaria Maugeri, Enzo Vincenti (n 8).
[54] This subdivision belongs to Shi C, Sourdin T and Li B, 'The Smart Court – A New Pathway to Justice in China?' (2021) 12 International Journal for Court Administration <https://doi.org/10.36745/ijca.367> accessed 5 July 2023. On the same matter, please see: Benjamin Minhao Chen, Zhyu Li, 'How will technology change the face of Chinese justice' (2020) 34 Colum J Asian L <https://heinonline.org/HOL/Page?handle=hein.journals/colas34&div=3&g_sent=1&casa_token=&collection=journals> accessed 5 July 2023.
[55] C Shi, T Sourdin, B Li. (n 54).
[56] Gao Jian, Yao Xueqian, Zhao Yan, 'Beijing High People's Court Now Livestreaming Court Hearings' (Sina News, 17 September 2009) <http://news.sina.com.cn/c/2009-09-17/065816311211s.shtml> accessed 5 July 2023.
[57] Mario Libertini, Maria Rosaria Maugeri, Enzo Vincenti (n 8).

The third phase began in 2014, when the Chinese Supreme People's Court expressed its opinion on the 4th Five-Year Reform of the People's Courts (which covered a timespan from 2014 to 2018). The Chinese Supreme People's Court stressed the importance of relying on technology to build judicial mechanisms that are open, dynamic, transparent, and convenient to improve public understanding, trust, and supervision of the judiciary.[58] More recently, in the 5th Five-Year Reform of People's Courts (2019-2023), the Chinese Supreme People's Court confirmed that the creation of smart courts is one of the ten objectives of justice reform.

Thus, in 2017, the first internet court was unveiled in Hangzhou, in the province of Zhejiang.[59]

This is not strictly a system of predictive justice as outlined in the previous sections, as processing final decisions on the basis of a dataset is not the exclusive task of the software. It is indeed software that not only provides a very high level of digitalisation of the trial but also involves digital support from beginning to end. In particular, the parties, through a platform that uses a blockchain system, start the trial, file the motions and proceed with the notification of the acts. The platform can host the hearings in a videoconference and collect evidence online (ie, hearing the testimony of a witness). The Hangzhou internet court exercises its jurisdiction in disputes related to internet use (such as, for example, online purchases), and not coincidentally, it arose at the place where Alibaba[60] has its registered office.

In any case, this is a method of carrying out a trial that is not binding on the parties, who may also opt for the ordinary modalities of carrying out the trial.

It is also interesting to note the role of the central government. In this context, it promotes and encourages decentralised initiatives: Chinese courts, through public funding from local governments, are called to develop autonomous initiatives to improve justice through legaltech systems in synergy with private companies.[61] In fact, following the creation of the first Hangzhou internet court in 2017, others were built in Beijing and Guangzhou.

The main purpose of the central government, however, is not to replace the human judge with internet courts; on the contrary, the internet courts are part of the

[58] For the English version of the 4th Five-Year Reform of the People's Courts please refer to the following link www.hshfy.sh.cn/shfy/web/xxnr_yshj.jsp?pa=aaWQ9MjAyMTUxMTQmeGg9MSZsbWRtPUxNMTIxMwPdcssPdcssz&zd= accessed 5 July 2023.

[59] An author's comment following a visit to the Hangzhou Court in 2017: "I was impressed with what I saw: a static robot in the reception area that offered online legal help for court users; on-site facilities for the e-filing of documents; dedicated virtual courtrooms; speaker-independent voice recognition (they no longer need stenographers); and a demonstration of China's first 'internet-court', which resolves internet-related disputes concerning, for example, online loans, e-commerce (contractual and product liability issues), domain name disputes, and online copyright issues. With 800 million users in China, the volume of related disputes has called for new methods. I am told that the court in Hangzhou has now handled more than 10,000 disputes, in roughly half of the time of traditional hearings" in Richard Susskind, *Online Courts and The Future of Justice* (OUP 2019).

[60] Alibaba is a private Chinese multinational enterprise composed of a several companies active in the field of e-commerce.

[61] Mario Libertini, Maria Rosaria Maugeri, Enzo Vincenti (n 8).

administration of justice as software to support the human decision-maker. In addition, the positive results that have been recorded support hope for such an outcome. In fact, the Hangzhou internet court reported an increase in the efficiency of the trials and noted that the online collection of evidence allowed the parties to avoid moving, therefore making the litigation more accessible.[62]

According to the data at hand, in two years of operation (2017-2019) 20,000 judgments were issued and there was a reduction of 65% of the time spent in hearings.[63]
Given the success of these methods of litigation, the Hangzhou internet court in 2019 published a white paper on the application of internet technology in judicial practice,[64] in which the technologies used by the court were indicated (of particular concern is the use of facial recognition to confirm the identity of the parties in the trial).

4.2 Digital justice in the US

The issue of civil digital justice in the United States seems to stand in contrast to other legal systems examined. In fact, it appears that at the moment, there are no public initiatives aimed at developing predictive justice software in the civil field, not that the courts would make some use of these kinds of software. [65]

However, there are some kinds of software used in law firms that were created as a result of private initiatives. Some examples are Coin (used by J. P. Morgan), Kira (used by DLA Piper), LexMachina (purchased by LexisNexis in 2015) and LinkRFI (used by Linklaters).[66]

It should be noted that, even if there are no civil initiatives, artificial intelligence supports (in particular, risk assessment tools) have been used for a long time in the US in the criminal justice field.

The most popular case on the matter is *Loomies vs. Wisconsin*, in which the COMPASS software was applied. It is a predictive sentencing tool used for the calculation of the risk of recidivism of accused persons in criminal proceedings and whose output is based on a number of variables: criminal records, personal attitudes, family structure, lifestyle, personality and social exclusion. It is an application mostly used in the states of Wisconsin, Michigan and Florida, where its use, such as with the use of the HART software, has not gone without criticism.[67]

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[62] C Shi, T Sourdin, B Li (n 54).
[63] D Chen, C Wang, 'What Hangzhou Internet Court has brought to us in the past two years' (Xinhua Net Legal Daily (, 15 August 2019) <www.zj.xinhuanet.com/2019-08/15/c_1124877777.htm> accessed 15 June 2023.
[64] Beijing Internet Court, 'White Paper on the Application of Internet Technology in Judicial Practice' (17 August 2019) <www.chinadaily.com.cn/specials/WhitePaperontheApplicationofInternetTechnologyinJudicialPractice.pdf> accessed 15 June 2023.
[65] In this term also Mario Libertini, Maria Rosaria Maugeri, Enzo Vincenti (n 8).
[66] For a more in-depth overview of these software programmes, see Mario Libertini, Maria Rosaria Maugeri, Enzo Vincenti (n 8).
[67] See the analysis conducted by ProPublica <www.propublica.org/article/machine-bias-risk-assessments-in-criminal-sentencing> accessed 15 June 2023 and the subsequent analysis conducted by Northpointe Inc. (now Equivant)

In the field of criminal law, in addition to predictive sentencing tools, there is also the use of law enforcement software. These tools are used by the police to identify areas most at risk: they are therefore aimed at preventing the commission of crimes.[68]

These are software programmes that reflect the debate still alive in the United States (but spread across Europe) on the possibility of predicting the criminal behaviour of individuals.[69]

The strong and constant interest of the United States in these applications could perhaps suggest why no targeted action has yet been taken in relation to predictive justice tools in the civil field.

5 Some benefits and issues of predictive justice tools in light of Italian legal systems

In this section, I will analyse both plausible and critical issues related to the use of predictive justice software within the civil trial. Since it is not possible here to deal exhaustively and comprehensively with all the possible aspects rising around the matter, I have chosen to analyse those of more immediate evidence.

5.1 Potential uses

5.1.1 Immediacy of decisions

Perhaps the first benefit that comes to mind when thinking about opportunities related to the use of predictive justice systems is the potential reduction in the time spent in trials.

One of the features of Italian civil trials is the system of procedural bars. This regime, among other functions, ensures a precise scan of the timing within which to define the perimeter of the *thema decidendum* and the *thema probandum*.

Although the recent reform of D. Lgs. n.149/2022 has reshaped the procedural phase relating to the definition of both the *thema decidendum* and *the thema probandum* with a view to accelerating the trial (Art. 163 and 171-ter Code of Civil Procedure), it will take at least 120 days for these terms to be fully defined.

<http://go.volarisgroup.com/rs/430-MBX-989/images/ProPublica_Commentary_Final_070616.pdf> accessed 15 June 2023.

[68] On the point see Fabio Basile, 'Intelligenza artificiale e diritto penale: quattro possibili percorsi di indagine' (2019) 10 Diritto Penale e Uomo <https://archiviodpc.dirittopenaleuomo.org/d/6821-intelligenza-artificiale-e-diritto-penale-quattro-possibili-percorsi-di-indagine> accessed 15 June 2023.

[69] Clementina Barbaro, 'Uso dell'intelligenza artificiale nei sistemi giudiziari: verso la definizione di principi etici condivisi a livello europeo?' (2018) 4 Questione Giustizia <www.questionegiustizia.it/rivista/articolo/uso-dell-intelligenza-artificiale-nei-sistemi-giud_591.php> accessed 17 June 2023.

To this term, the time necessary for evidentiary instruction, which strongly depends on the written load of the individual judge, and time relating to the decision-making phase must be added.

A significant reduction in the timelines just exposed could be achieved through the use of software similar to the one being designed in Estonia. We could in fact think—at least for a first phase of experimentation—about the use of such software for the resolution of small claims. However, the critical issues that will be further analysed in the following section suggest that such a system should preferably be placed outside the jurisdictional field, at least until the main difficulties can be overcome. It could be better framed as online dispute resolution software (ODR) or as software that can be used by the lawyer to provide to his or her client a preliminary view of the hypothetical outcome of the dispute to better consider the choice of whether to take legal action.

5.1.2 Disincentive of litigation

The use of predictive justice software as outlined in the previous section would have two types of consequences.

We've already spotted one. If the programme ware able to predict the hypothetical outcome of the dispute, this may lead to, on the one hand, economic savings for the customer (who would otherwise be exposed to a vain economic outlay in the event of failure, after considering, for example, the costs of litigation and professional fees) and, on the other hand, a disincentive of litigation[70] with the consequent reduction of pending loads.

The second consequence relates to the knowledge of the probable conclusion of the trial brought by the possible plaintiff, which could be used by the judge as an index to evaluate the abuse of the right of action or the exercise of this merely for the purposes of delay. This is reflected in the topic of *vexatious* litigation.

The judge, in fact, would have at his or her disposal an additional criterion in light of which to assess the diligence of the parties involved and, therefore, to assess whether the plaintiff was actually aware of the manifest groundlessness of his accusations. From this perspective, the way is thus opened to a different evaluation of the judgment that the judge is called to make in relation to "*mala fede o colpa grave*" (Art. 96, co. 1 Code of Civil Procedure).

[70] In further discussion of these terms, see also Elena Gabellini, 'La comodità nel giudicare: la decisione robotica' (2019) 4 Riv. trim. dir. proc. civ. 1305; Elena Gabellini, 'Algoritmi decisionali e processo civile: limiti e prospettive' (2022) 1 Riv. trim. dir. proc. civ. 59.

5.1.3 Legal certainty and legal calculability

Another positive aspect of predictive judicial systems is the valorisation of precedents.[71] An automated decision would certainly reward the impartiality and objectivity of the previous decision. In fact, in the same cases, unreasonable differential treatment would be avoided, thus achieving better standards of substantial justice[72] (Art. 3 of the Italian Constitution).

It has been pointed out, however, that in a multiplicity of cases, there are factual and legislative elements that may complicate, if not prevent, a correct calculation.[73] Some of them are, for example, i) the crisis of juridical positivism[74] and an increasing stratification of the sources of law[75]; ii) the physiological profiles of juridical incalculability as well as any antinomies and the use by the legislature of flexible terms and general clauses.

5.2 Criticality of predictive justice tools

5.2.1 Opacity of the algorithm

Given the fundamental role played by the motivation of the decision, the issue of the opacity of the algorithm (so-called black box)[76] becomes extremely problematic. The result presented by the programme is in fact not explainable in the same way and extent to which the judge has the obligation to justify his or her conviction (Art. 111 Italian Constitution, 132, n.4 Code of Civil Procedure, 118 provisions implementing the Code of Civil Procedure). In fact, following the implementation of l. n. 69/2009, to respect the

[71] On the importance of predictability of decisions for the efficiency of justice see Giorgio Costantino, 'La prevedibilità delle decisioni tra uguaglianza e apparenza (Relazione alla XXIX Conferenza dell'Osservatorio Giordano dell'Amore sui rapporti tra diritto e economia, Milano, 5 febbraio 2015 e al Primo Congresso Giuridico di Monza, Como e Lecco, Monza, 19 febbraio 2015)' (2015) 3 Rivista di diritto processuale 646.

[72] For more discussion of these terms, see also Elena Gabellini, 'La comodità nel giudicare: la decisione robotica' (n 70); Elena Gabellini, 'Algoritmi decisionali e processo civile: limiti e prospettive' (n 70).

[73] Antonio Carratta (n 1).

[74] Vittorio Villa, 'Il problema della scienza giuridica' in Giorgio Pino, Aldo Schiavello, Vittorio Villa (ed), *Filosofia del diritto. Introduzione critica al pensiero giuridico e al diritto positive* (Giappichelli 2013) 387; Pierluigi Chiassoni, *Positivismo giuridico* (Mucchi 2013) 56; E Pattaro, 'Il positivismo giuridico italiano dalla rinascita alla crisi' in Uberto Scarpelli (ed), *Diritto e analisi del linguaggio* (Comunità 1976).

[75] On this point, see G. Pino, 'La gerarchia delle fonti del diritto. Costruzione, decostruzione, ricostruzione' (2011) 1 Ars Interpretandi <www.arsinterpretandi.it/2011-stato-contemporaneo-crisi/> accessed 7 June 2023; Nicolò Lipari, 'I civilisti e la certezza del diritto' (2015) 2 Ars Interpretandi <www.rivisteweb.it/doi/10.7382/82125> accessed 10 June 2023; Natalio Irti, *Un diritto incalcolabile* (Giappichelli 2017); Natalino Irti, 'La crisi della fattispecie' (2014) 1 ivista di diritto processuale.

[76] On this point, see Germana Lo Sapio, 'La black box: l'esplicabilità delle scelte algoritmiche quale garanzia di buona amministrazione' (2021) 16 Federalismi <www.federalismi.it/nv14/articolo-documento.cfm?artid=45610> accessed 26 June 2023; Giorgio Resta, 'Algoritmi, diritto e democrazia' (2019) 4 Giustiziacivile.com <https://giustiziacivile.com/soggetti-e-nuove-tecnologie/editoriali/algoritmi-diritto-democrazia> accessed 26 June 2023; Gherardo Carullo, 'Decisione amministrativa e intelligenza artificiale' (2021) 3 Diritto dell'informazione e dell'informatica 431, 461.

"*constitutional minimum of the motivation*"[77], the decision must contain "*la concisa esposizione delle ragioni di fatto e di diritto*" (Art. 132, n. 4 Code of Civil Procedure), consisting of "*nella succinta esposizione dei fatti rilevanti della causa e delle ragioni giuridiche della decisione, anche con riferimento a precedenti conformi*" (Art. 118, 1 provisions implementing the Code of Civil Procedure). In addition, "*debbono essere esposte concisamente e in ordine le questioni discusse e decise dal collegio ed indicati le norme di legge e i principi di diritto applicati*" (Art. 118, co. 2 disp. att. Code of Civil Procedure).

The output of the algorithm, therefore, cannot be adequately supported by logical legal reasoning. This alone would make the use of predictive justice systems in decision-making incompatible with the Italian framework.

The opacity of the algorithm also creates problems for the impugnation of the judgment. A decision that does not state the logical and legal reasons behind it empties of content the instruments made available by the legislature to ask for the reform of a judgment that is considered unjust or illegitimate.

On this point, Art. 342 Code of Civil Procedure states that for each of the grounds of appeal, we must indicate "*a pena di inammissibilità, in modo chiaro, sintetico e specifico*" and also "*le censure proposte alla ricostruzione dei fatti compiuta dal giudice di primo grado*" and "*le violazioni di legge denunciate e la loro rilevanza ai fini della decisione impugnata*". It is therefore self-evident to say that if the machine does not provide any motivation, the losing party will be at root precluded from denouncing violations of the law and errors to the reconstruction of the facts.

However, these issues could be overcome once again by placing these instruments outside the jurisdictional field by framing them as systems to support lawyers or as systems of ODR.

5.2.2 Independence of the judge

The predictive justice system in providing a solution to the judge influences the decision-making process[78]: this is the c.d. performative effect or self-realisation of the algorithm.[79] Precisely, this effect risks transforming the response of the algorithm from mere indication to prescription.[80]

[77] On these terms, see Giovanni Canzio, 'L'art. 111 della Costituzione, commi 6, 7 e 8' [2021] La Magistratura <https://lamagistratura.it/commentario/lart-111-sesto-settimo-e-ottavo-comma-della-costituzione/#:~:text=111%2C%20co.,Cassazione%20per%20violazione%20di%20legge> accessed 5 June 2023.
[78] Filomena Santagada(n 16).
[79] *See note*; Domenico Dalfino, 'Creatività e creazionismo, prevedibilità e predittività' (2018) 12 Il Foro italiano 385. See also Giuseppina Fanelli, 'L'impiego dell'intelligenza artificiale nei processi decisori del giudice, tra la disciplina europea e quella del processo civile' in Rosaria Giordano and others (eds), *Il Diritto nell'Era Digitale. Persona, Mercato, Amministrazione, Giustizia* (Giuffrè Francis Lefebvre 2022) 993.
[80] Filomena Santagada (n 16).

Further examining the question, we can observe friction with the principle of the independence of the judge (Art. 104, paragraph 1 Italian Constitution).

In the face of the risk of generating self-fulfilling prophecy[81] (the prediction that becomes the decision), which derives from the performative effect of the algorithm, lies the risk that the activities of software companies that implement predictive justice systems end up directing judicial activity, thereby undermining its independence.[82] Therefore, with AI decision-making systems, there is a risk of the subjugation of the judge to technology and no longer only to the law.

In this way, among other things, the principle of independence takes on a different connotation that goes beyond its function of safeguarding the judiciary from the other powers of the state, particularly from the government: it becomes a principle of protection against legaltech.[83]

5.2.3 Imputability of the decision

The imputability of the decision depends on the type of mathematical model underlying the predictive justice software.[84] A distinction can be made between expert systems[85] on the one hand and machine learning models on the other.

The first ones are those that rely on inferential mechanisms and follow the rule "if X then Y": upon the occurrence of a specific Condition X, then the machine will provide the answer Y. The software in these hypotheses uses reasoning of deductive type.[86] In these cases, the programmer must provide the machine with the logical rule.

Let us take an example: Art. 10 and ss. Code of Civil Procedure identifies the criteria for determining competence by value, matter and territory. To enable the algorithm to verify whether the trial has been instituted before a competent court, the rules for determining jurisdiction in value, matter and territory should be established for the programme by the programmer.

This is not a difficult task. It is sufficient that the programmer gives the machine the logical inference as a rule "if X then Y", which, after applying it, for example, to Art. 18 Code of Civil Procedure will be a rule of the type "if the defendant has residence in Rome, then the court of Rome will be competent". For the imputability of the decision in these

[81] Domenico Dalfino (n 79).
[82] Filomena Santagada (n 16).
[83] Domenico Dalfino, 'Stupidità (non solo) artificiale, predittività e processo' [2019] Questione Giustizia <www.questionegiustizia.it/articolo/stupidita-non-solo-artificiale-predittivita-e-processo_03-07-2019.php> accessed 7 June 2023.
[84] See Gherardo Carullo (n 76).
[85] Filomena Santagada (n 16). See also Piergiuseppe Otranto, 'Riflessioni in tema di decisione amministrativa, intelligenza artificiale e legalità' (2021) 7 Federalismi.it <www.federalismi.it/nv14/articolo-documento.cfm?Artid=45026&content=&content_author=> accessed 13 June 2023.
[86] On the deductive argument, recently, see Roberto Ciuni, Aldo Frigerio, 'Gli argomenti deduttivi' in Damiano Canale, Roberto Ciuni, Aldo Frigerio (eds), *Critical Thinking: An Introduction* (EGEA, 2021). See also Jonathan Bennet, *A philosophical guide to conditional* (Claredon Press 2003); Paolo Legrenzi, Armando Massarenti, *La buona logica* (Raffaello Cortina 2016).

cases, there is no doubt that the algorithm has received the logical rules for reasoning from humans, and therefore, the imputability of the decision can be referred to humans. The problem that is feared here is how the decision can be imputed to the judge who uses the AI system and not to the programmer who designed the software.

The second approach (machine learning models) poses major problems. These can be applied whenever the system has to decide according to the previous case law.[87]

These are models that do not decide through logical rules of inference imparted to the programme by a human programmer. Instead, these programmes, on the basis of a sufficiently representative dataset, generate a mathematical model. They extrapolate the rule by which, given that dataset, that specific response can be provided.

The machine basically replaces the programmer who, in expert systems, provides the rules for the software. In machine learning systems, in fact, it is the same software that, starting from the training set, extrapolates the rule through which it will then provide the subsequent outputs.

Therefore, since there is no human agent here to give the rules for decisions to the software, the problemme of the imputability of the output of the machine is much more evident. Ultimately, this aspect is connected to the black box problem.

6 Conclusions

From the legal panorama described above, we can identify some trends.

The most innovative trend, in terms of the legal regulations of artificial intelligence systems, is certainly the one adopted by the European Union with the AI Act. In fact, Europe is preparing to become the first legal system in the world to regulate the instruments of artificial intelligence, including those of predictive justice (Annex III, paragraph 8, lit. a).

In this context, the question that needs to be addressed is who will be in charge of developing (private or public) predictive justice software.

One initiative that does not seem to be within the scope of Italian institutions at the moment is the creation of a public database to be set up at the Ministry of Justice. We have seen that in those contexts where digital justice is most advanced (Estonia, France and China); a fundamental step has been to establish an open access database that contains all the judgments issued by the judicial authorities. It is therefore a necessary intermediate step, without which it will be very difficult to develop predictive justice tools.

In China, however, the situation seems to be the opposite. This is a context in which the development of digital justice software began years ago (it dates back to the second

[87] For this term, see Gherardo Carullo (n 76). See also Roberto Cavallo Perin, Isabella Alberti, 'Atti e procedimenti amministrativi digitali' in Roberto Cavallo Perin, Diana-Urania Galetta (eds), *Il diritto dell'amministrazione pubblica digitale* (Giappichelli 2020).

phase—2003-2014—when the first database containing judgments was created). What is lacking, however, is a legal regulation of these instruments, the use of which is encouraged by the central government, but the implementation of which is left to local courts.

Finally, there seems to be no such initiative in the US legal system in the civil field.

For Italy, from the projects in place at some courts of appeal, it seems that the intention is to approach other legal realities in which projects related to digital civil justice are already in an advanced stage.

In my opinion, the use of artificial intelligence systems in the jurisdictional activity needs to be gradually implemented. A first step could be introducing tools for deciding preliminary ritual issues, such as jurisdiction and competence: in this regard so-called "expert systems" could be use.

However, when it comes to the resolution of prejudicial and dependence issues the implementation of artificial intelligence systems becomes even more complex. Some issues arise from the difficulty of making the machine understand the meaning of technical words such as "prejudicial" and "dependent". Equally if not more challenging is programming of predictive justice tools used for the entire dispute decision.

In any case, a preliminary fundamental step is the creation of open access database that contains all the judgments issued by the judicial authorities. In this regard, it is necessary that its construction will be delegated to the public power in order to prevent private interests from influencing the decision of the jurisdictional authorities.