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DRAFT REPORT

with recommendations to the Commission on a framework of ethical aspects of artificial intelligence, robotics and related technologies
(2020/2012(INL))

Committee on Legal Affairs

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(Initiative – Rule 47 of the Rules of Procedure)

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MOTION FOR A EUROPEAN PARLIAMENT RESOLUTION

with recommendations to the Commission on a framework of ethical aspects of artificial intelligence, robotics and related technologies (2020/2012(INL))

The European Parliament,

- having regard to Article 225 of the Treaty on the Functioning of the European Union,
- having regard to Article 114 of the Treaty on the Functioning of the European Union,
- having regard to Council Regulation (EU) 2018/1488 of 28 September 2018 establishing the European High Performance Computing Joint Undertaking¹,
- having regard to the proposal for a Regulation of the European Parliament and of the Council of 6 June 2018 establishing the Digital Europe Programme for the period 2021-2027 (COM(2018)0434),
- having regard to the Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions of 19 February 2020 on Artificial Intelligence - A European approach to excellence and trust (COM(2020)0065),
- having regard to the Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions of 19 February 2020 on A European strategy for data (COM(2020)0066),
- having regard to the Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions of 19 February 2020 on Shaping Europe's digital future (COM(2020)0067),
- having regard to its resolution of 16 February 2017 with recommendations to the Commission on Civil Law Rules on Robotics²,
- having regard to its resolution of 1 June 2017 on digitising European industry³,
- having regard to its resolution of 12 September 2018 on autonomous weapon systems⁴,
- having regard to its resolution of 11 September 2018 on language equality in the digital age⁵
- having regard to its resolution of 12 February 2019 on a comprehensive European

¹ OJ L 252, 8.10.2018, p. 1.

² OJ C 252, 18.7.2018, p. 239.

³ OJ C 307, 30.8.2018, p. 163.

⁴ OJ C 433, 23.12.2019, p. 86.

⁵ Texts adopted, P8_TA(2018)0332.

industrial policy on artificial intelligence and robotics⁶,

- having regard to the report of 8 April 2019 of the High-Level Expert Group on Artificial Intelligence set up by the Commission entitled ‘Ethics Guidelines for Trustworthy AI’,
- having regard to the briefings and studies prepared at the request of the Panel for the Future of Science and Technology (STOA), managed by the Scientific Foresight Unit within the European Parliamentary Research Service, entitled “What if algorithms could abide by ethical principles?”, “Artificial Intelligence *ante portas*: Legal & ethical reflections”, “A governance framework for algorithmic accountability and transparency”, “Should we fear artificial intelligence?” and “The ethics of artificial intelligence: Issues and initiatives”,
- having regard to Rules 47 and 54 of its Rules of Procedure,
- having regard to the opinions of the Committee on Foreign Affairs, the Committee on the Internal Market and Consumer Protection, the Committee on Transport and Tourism, the Committee on Civil Liberties, Justice and Home Affairs, the Committee on Employment and Social Affairs, the Committee on the Environment, Public Health and Food Safety and the Committee on Culture and Education,
- having regard to the report of the Committee on Legal Affairs (A9-0000/2020),

Introduction

- A. whereas artificial intelligence, robotics and related technologies with the potential to directly impact all aspects of our societies, including basic social and economic principles and values, are being developed very quickly;
- B. whereas the Union and its Member States have a particular responsibility to make sure that these technologies contribute to the well-being and general interest of their citizens;
- C. whereas a common framework for the development, deployment and use of artificial intelligence, robotics and related technologies within the Union should both protect citizens from their potential risks and promote the trustworthiness of such technologies in the world;
- D. whereas Parliament has carried out substantial research and adopted several positions on the legal and ethical questions relating to these technologies;
- E. whereas such questions should be addressed through a comprehensive and future-proof legal framework reflecting the Union’s principles and values as enshrined in the Treaties and the Charter of Fundamental Rights that would bring legal certainty to businesses and citizens alike;
- F. whereas for the scope of that framework to be adequate it should cover a wide range of technologies and their components, including algorithms, software and data used or produced by them;
- G. whereas that framework should encompass all situations requiring due consideration of

⁶ Texts adopted, P8_TA(2019)0081.

the Union's principles and values, namely development, deployment and use of the relevant technologies and their components;

- H. whereas a harmonised approach to ethical principles relating to artificial intelligence, robotics and related technologies requires a common understanding in the Union of those concepts and of concepts such as algorithms, software, data or biometric recognition;
- I. whereas action at Union level is justified by the need for a homogenous application of common ethical principles when developing, deploying and using artificial intelligence, robotics and related technologies;
- J. whereas common ethical principles are only efficient where those responsible for ensuring, assessing and monitoring compliance are identified;
- K. whereas each Member State should establish a national supervisory authority responsible for ensuring, assessing and monitoring compliance, and for enabling discussion and exchange of points of view in close cooperation with the concerned stakeholders and the civil society;
- L. whereas Parliament continues to call for the establishment of a European Agency to ensure a harmonised approach across the Union and address the new opportunities and challenges, in particular those of a cross-border nature, arising from ongoing technological developments.

Human-centric and human-made artificial intelligence

- 1. Declares that the development, deployment and use of artificial intelligence, robotics and related technologies, including but not exclusively by human beings, should always respect human agency and oversight, as well as allow the retrieval of human control at any time;

Risk assessment

- 2. Considers that the determination of whether artificial intelligence, robotics and related technologies are to be considered high-risk as regards compliance with ethical principles should always follow from an impartial, regulated and external assessment;

Safety features, transparency and accountability

- 3. Maintains that artificial intelligence, robotics and related technologies, including the software, algorithms and data used or produced by such technologies should be developed in a secure, technically rigorous manner and in good faith;
- 4. Underlines that explainability is essential to ensuring that citizens trust these technologies, even if the degree of explainability is relative to the complexity of the technologies, and that it should be complemented by auditability and traceability;

Non-bias and non-discrimination

- 5. Recalls that the development, deployment and use of artificial intelligence, robotics and related technologies, including the software, algorithms and data used or produced by

such technologies, should respect human dignity and ensure equal treatment for all;

6. Affirms that possible bias in and discrimination by software, algorithms and data should be addressed by setting rules for the processes through which they are designed and used, as this approach would have the potential to turn software, algorithms and data into a considerable counterbalance to bias and discrimination, and a positive force for social change;

Social responsibility and gender balance

7. Emphasises that socially responsible artificial intelligence, robotics and related technologies should safeguard and promote fundamental values of our society such as democracy, diverse and independent media and objective and freely available information, health and economic prosperity, equality of opportunity, workers' and social rights, quality education, cultural and linguistic diversity, gender balance, digital literacy, innovation and creativity;
8. Proposes that the potential of artificial intelligence, robotics and related technologies in this regard should be maximized and explored through responsible research and innovation that requires the mobilisation of resources by the Union and its Member States;
9. Insists that the development, deployment and use of these technologies should not cause injury or harm of any kind to individuals or society;

Environment and sustainability

10. States that it is essential that artificial intelligence, robotics and related technologies support the achievement of sustainable development, climate neutrality and circular economy goals; the development, deployment and use of these technologies should be environmentally friendly, and contribute to minimising any harm caused to the environment during their lifecycle and across their entire supply chain;
11. Proposes that the potential of artificial intelligence, robotics and related technologies in this regard should be maximized and explored through responsible research and innovation that requires the mobilisation of resources by the Union and its Member States;
12. Highlights that the development, deployment and use of these technologies provide numerous opportunities for the achievement of the Sustainable Development Goals outlined by the United Nations;

Privacy and biometric recognition

13. Observes that data production and use, including personal data such as biometric data, resulting from the development, deployment and use of artificial intelligence, robotics and related technologies are rapidly increasing, thereby underlining the need to respect the rights of citizens to privacy and protection of personal data in line with Union law;
14. Points out that the possibility provided by these technologies of using personal data and non-personal data to categorise and micro-target people, identify the vulnerabilities of

individuals, or exploit accurate predictive knowledge, has to be counterweighted by the principles of data minimisation, the right to obtain an explanation of a decision based on automated processing and privacy by design, as well as those of proportionality, necessity and limitation based on purpose;

15. Emphasises that when remote recognition technologies are used by public authorities during times of national emergency, such as during a national health crisis, their use should always be proportionate, limited in time and respectful of human dignity and fundamental rights;

Governance

16. Stresses that appropriate governance of the development, deployment and use of artificial intelligence, robotics and related technologies, including by having measures in place focusing on accountability and addressing potential risks of bias and discrimination, increases citizens' safety and trust in those technologies;
17. Observes that data are used in large volumes in the development of artificial intelligence, robotics and related technologies and that the processing, sharing of and access to such data must be governed in accordance with the requirements of quality, integrity, security, privacy and control;
18. Underlines the need to ensure that data belonging to vulnerable groups, such as people with disabilities, patients, children, minorities and migrants, are protected adequately;

National supervisory authorities

19. Notes the added value of having national supervisory authorities in each Member State responsible for ensuring, assessing and monitoring compliance with ethical principles for the development, deployment and use of artificial intelligence, robotics and related technologies;
20. Indicates that such authorities should liaise not only among themselves but also with the European Commission and other relevant institutions, bodies, offices and agencies of the Union in order to guarantee coherent cross-border action;
21. Calls for such authorities to be tasked with promoting regular exchanges with civil society and innovation within the Union by providing assistance to concerned stakeholders, in particular small and medium-sized enterprises or start-ups;

A European Agency for Artificial Intelligence

22. Recalls that Parliament's resolution of 16 February 2017 with recommendations to the Commission on Civil Law Rules on Robotics asked the Commission to consider the designation of a European Agency for Artificial Intelligence;
23. Calls on the Commission to follow-up on that request, especially in view of the added-value of having a body at Union level coordinating the mandates and actions of each national supervisory authority as referred to in the previous sub-section;
24. Believes that such a body, as well as the certification referred to in the following

paragraph, would not only benefit the development of Union industry and innovation in that context but also increase the awareness of our citizens regarding the opportunities and risks inherent to these technologies;

European certification of ethical compliance

25. Suggests that the European Agency for Artificial Intelligence develops common criteria and an application process relating to the granting of a European certificate of ethical compliance following a request by any developer, deployer or user seeking to certify the positive assessment of compliance carried out by the respective national supervisory authority;

International cooperation

26. Stresses that the Union's ethical principles for the development, deployment and use of these technologies should be promoted worldwide by cooperating with international partners and liaising with third countries with different development and deployment models.
27. Recalls that the opportunities and risks inherent to these technologies have a global dimension that requires a consistent approach at international level and thus calls on the Commission to work in bilateral and multilateral settings to advocate and ensure ethical compliance
28. Points out the added-value of a European Agency as referred to above in this context as well.

Final aspects

29. Concludes, following the above reflections on aspects related to the ethical dimension of artificial intelligence, robotics and related technologies, that the ethical dimension should be framed as a series of principles resulting in a legal framework at Union level supervised by national competent authorities, coordinated and enhanced by a European Agency for Artificial Intelligence and duly respected and certified within the internal market;
30. Following the procedure of Article 225 of the Treaty on the Functioning of the European Union, requests the Commission to submit a proposal for a Regulation on ethical principles for the development, deployment and use of artificial intelligence, robotics and related technologies on the basis of Article 114 of the Treaty on the Functioning of the European Union and following the detailed recommendations set out in the annex hereto;
31. Recommends that the European Commission review existing Union law applicable to artificial intelligence, robotics and related technologies in order to address the rapidity of their development in line with the recommendations set out in the annex hereto;
32. Considers that the requested proposal would have financial implications if a new European Agency for Artificial Intelligence is set up;
33. Instructs its President to forward this resolution and the accompanying detailed

recommendations to the Commission and the Council.

ANNEX TO THE MOTION FOR A RESOLUTION: DETAILED RECOMMENDATIONS AS TO THE CONTENT OF THE PROPOSAL REQUESTED

A. PRINCIPLES AND AIMS OF THE PROPOSAL REQUESTED

I. The main principles and aims of the proposal are:

- to build trust in artificial intelligence, robotics and related technologies by ensuring that these technologies will be developed, deployed and used in an ethical manner;
- to support the development of artificial intelligence, robotics and related technologies in the Union, including by helping businesses and start-ups to assess and address regulatory requirements and risks during the development process;
- to support deployment of artificial intelligence, robotics and related technologies in the Union by providing the appropriate regulatory framework;
- to support use of artificial intelligence, robotics and related technologies in the Union by ensuring that they are developed, deployed and used in an ethical manner;
- to require better information flows among citizens and within organisations developing, deploying or using artificial intelligence, robotics and related technologies as a means of ensuring that these technologies are compliant with the ethical principles of the proposed Regulation.

II. This proposal consists of the following parts:

- a “Regulation on ethical principles for the development, deployment and use of artificial intelligence, robotics and related technologies”;
- a European Agency for Artificial Intelligence and a European certification of ethical compliance;
- the support role of the European Commission;
- the work carried out by the “Supervisory Authority” in each Member State to ensure that ethical principles are applied to artificial intelligence, robotics and related technologies;
- the involvement and consultation of, as well as provision of support to, stakeholders, including start-ups, businesses, social partners, and other representatives of the civic society.

III. The “Regulation on ethical principles for the development, deployment and use of artificial intelligence, robotics and related technologies” builds on the following principles:

- human-centric and human-made artificial intelligence, robotics and related

technologies;

- risk assessment of artificial intelligence, robotics and related technologies;
- safety features, transparency and accountability;
- safeguards against bias and discrimination;
- social responsibility and gender balance in artificial intelligence, robotics and related technologies;
- environmentally friendly and sustainable artificial intelligence, robotics and related technologies;
- respect for privacy and limitations to the use of biometric recognition;
- governance relating to artificial intelligence, robotics and related technologies, including the data used or produced by such technologies.

IV. The key elements of the Commission’s task as regards compliance with ethical principles for the development, deployment and use of artificial intelligence, robotics and related technologies are:

- monitoring the implementation of the proposed Regulation;
- raising awareness, providing information and engaging in exchanges with developers, deployers and users throughout the Union.

V. The European Agency for Artificial Intelligence should be established following a detailed proposal from the Commission, which should include the following main tasks:

- to supervise the application of the proposed Regulation;
- to issue guidance as regards the application of the proposed Regulation;
- to liaise with the “Supervisory Authority” in each Member State and coordinate their mandate and tasks;
- to develop a European certificate of compliance with ethical principles;
- to support regular exchanges with concerned stakeholders and the civil society.

VI. The key tasks of the “Supervisory Authority” in each Member State should be:

- to assess whether artificial intelligence, robotics and related technologies, including software, algorithms and data used or produced by such technologies, developed, deployed and used in the Union are high-risk technologies;
- to monitor their compliance with the ethical principles set out in the proposed Regulation;
- to contribute to the consistent application of the proposed Regulation in

cooperation with other Supervisory Authorities, the European Commission and other relevant institutions, bodies, offices and agencies of the Union; and

- to be responsible for establishing standards for the governance of artificial intelligence, robotics and related technologies, including by liaising with the maximum possible number of stakeholders and civil society representatives.

VII. The key role of stakeholders should be to engage with the Commission, the European Agency for Artificial Intelligence and the “Supervisory Authority” in each Member State.

B. TEXT OF THE LEGISLATIVE PROPOSAL REQUESTED

Proposal for a

REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

on ethical principles for the development, deployment and use of artificial intelligence, robotics and related technologies

Having regard to the Treaty on the Functioning of the European Union, and in particular Article 114 thereof,

Having regard to the proposal from the European Commission,

After transmission of the draft legislative act to the national parliaments,

Having regard to the opinion of the European Economic and Social Committee,

Acting in accordance with the ordinary legislative procedure,

Whereas:

- (1) The development, deployment and use of artificial intelligence, robotics and related technologies, including the software, algorithms and data used or produced by such technologies, are based on a desire to serve society. They can entail opportunities and risks, which should be addressed and regulated by a comprehensive legal framework of ethical principles to be complied with from the moment of the development and deployment of such technologies to their use.
- (2) The level of compliance with the ethical principles regarding the development, deployment and use of artificial intelligence, robotics and related technologies, including the software, algorithms and data used or produced by such technologies in the Union should be equivalent in all Member States, in order to efficiently seize the opportunities and consistently address the risks of such technologies. It should be ensured that the application of the rules set out in this Regulation throughout the Union is homogenous.
- (3) In this context, the current diversity of the rules and practices to be followed across the Union poses a significant risk to the protection of the well-being and prosperity of individuals and society alike, as well as to the coherent exploration of the full potential that artificial intelligence, robotics and related technologies have in promoting and preserving that well-being and prosperity. Differences in the degree of consideration of the ethical dimension inherent to these technologies can prevent them from being freely developed, deployed or used within the Union and such differences can

constitute an obstacle to the pursuit of economic activities at Union level, distort competition and impede authorities in the fulfilment of their obligations under Union law. In addition, the absence of a common framework of ethical principles for the development, deployment and use of artificial intelligence, robotics and related technologies results in legal uncertainty for all those involved, namely developers, deployers and users.

- (4) Nevertheless, this Regulation should provide a margin of manoeuvre for Member States, including with regard to how the mandate of their respective national supervisory authority is to be carried out in view of the objectives it is to pursue as laid down herein.
- (5) The geographical scope of application of such a framework should cover all the components of artificial intelligence, robotics and related technologies developed, deployed or used in the Union, including in cases where part of the technologies might be located outside the Union or not have a specific location, such as in the case of cloud computing services.
- (6) A common understanding in the Union of notions such as artificial intelligence, robotics, related technologies, algorithms and biometric recognition is required in order to allow for a harmonized regulatory approach. However, the specific legal definitions need to be developed in the context of this Regulation without prejudice to other definitions used in other legal acts and international jurisdictions.
- (7) The development, deployment and use of artificial intelligence, robotics and related technologies, including the software, algorithms and data used or produced by such technologies, should be such as to ensure that the best interests of citizens are considered, and should respect fundamental rights as set out in the Charter of Fundamental Rights of the European Union ('the Charter'), settled case-law of the Court of Justice of the European Union, and other European and international instruments which apply in the Union.
- (8) Artificial intelligence, robotics and related technologies have been provided with the ability to learn from data and experience, as well as to take founded decisions. Such capacities need to remain subject to meaningful human review, judgment, intervention and control. The technical and operational complexity of such technologies should never prevent their deployer or user from being able to, at the very least, alter or halt them in cases where the compliance with the principles set out in this Regulation is at risk.
- (9) Any artificial intelligence, robotics and related technologies, including the software, algorithms and data used or produced by such technologies, which entails a high risk of breaching the principles of safety, transparency, accountability, non-bias or non-discrimination, social responsibility and gender balance, environmental friendliness and sustainability, privacy and governance, should be considered high-risk from a

compliance with ethical principles perspective where that is the conclusion of an impartial, regulated and external risk assessment by the national supervisory authority.

- (10) Notwithstanding the risk assessment carried out in relation to compliance with ethical principles, artificial intelligence, robotics and related technologies, including the software, algorithms and data used or produced by such technologies, should always be assessed as to their risk on the basis of objective criteria and in line with relevant sector-specific legislation applicable in different fields such as those of health, transport, employment, justice and home affairs, media, education and culture.
- (11) Trustworthy artificial intelligence, robotics and related technologies, including the software, algorithms and data used or produced by such technologies should be developed, deployed and used in a safe, transparent and accountable manner based on the features of robustness, resilience, security, accuracy and error identification, explainability and identifiability, and in a manner that makes it possible to be temporarily disabled and to revert to historical functionalities in cases of non-compliance with those safety features.
- (12) Developers, deployers and users are responsible for compliance with safety, transparency, and accountability principles to the extent of their involvement with the artificial intelligence, robotics and related technologies concerned, including the software, algorithms and data used or produced by such technologies. Developers should ensure that the technologies concerned are designed and built in line with safety features, whereas deployers and users should deploy and use the concerned technologies in full observance of those features.
- (13) Developers and deployers should make available to users any subsequent updates of the technologies concerned, namely in terms of software.
- (14) To the extent that their involvement with those technologies influences the compliance with the safety, transparency and accountability requirements set out in this Regulation, users should use artificial intelligence, robotics and related technologies in good faith. This means, in particular, that they should not use those technologies in a way that contravenes the ethical principles laid down in this legal framework and the requirements listed therein. Beyond such use in good faith, users should be exempt from any responsibility that otherwise falls upon developers and deployers as established in this Regulation.
- (15) The citizens' trust in artificial intelligence, robotics and related technologies, including the software, algorithms and data used or produced by such technologies, depends on the understanding and comprehension of the technical processes. The degree of explainability of such processes should depend on the context and the severity of the consequences of an erroneous or inaccurate output of those technical processes, and needs to be sufficient for challenging them and seeking redress. Auditability and traceability should remedy the possible unintelligibility of such technologies.

- (16) Society's trust in artificial intelligence, robotics and related technologies, including the software, algorithms and data used or produced by such technologies, depends on the degree to which their assessment, auditability and traceability are enabled in the technologies concerned. Where the extent of their involvement so requires, developers should ensure that such technologies are designed and built in a manner that enables such an assessment, auditing and traceability. Deployers and users should ensure that artificial intelligence, robotics and related technologies are deployed and used in full respect of transparency requirements, and allowing auditing and traceability.
- (17) Bias in and discrimination by software, algorithms and data is unlawful and should be addressed by regulating the processes through which they are designed and used.
- (18) Software, algorithms and data used or produced by artificial intelligence, robotics and related technologies should be considered biased where, for example, they display suboptimal results in relation to any person or group of persons, on the basis of a prejudiced personal, social or partial perception and subsequent processing of data relating to their traits.
- (19) In line with Union law, software, algorithms and data used or produced by artificial intelligence, robotics and related technologies should be considered discriminatory where they treat a person or group of persons differently, including by putting them at a disadvantage when compared to others, based on grounds such as their personal traits, without objective or reasonable justification.
- (20) In line with Union law, legitimate aims that might objectively justify any differential treatment between persons or group of persons are the protection of public safety, security and health, the prevention of criminal offences, the protection of individual rights and freedoms, fair representation and objective professional requirements.
- (21) Artificial intelligence, robotics and related technologies, including software, algorithms and data used or produced by such technologies, should perform on the basis of sustainable progress. Such technologies should contribute comprehensively to the achievement of the Sustainable Development Goals outlined by the United Nations with a view to enabling future generations to flourish. Such technologies can support the monitoring of adequate progress on the basis of sustainability and social cohesion indicators, and by using responsible research and innovation tools requiring the mobilisation of resources by the Union and its Member States to support and invest in projects addressing those goals.
- (22) The development, deployment and use of artificial intelligence, robotics and related technologies, including the software, algorithms and data used or produced by such technologies, should in no way cause injury or harm of any kind to individuals or society. Accordingly, such technologies should be developed, deployed and used in a socially responsible manner.
- (23) For the purposes of this Regulation, developers, deployers and users should be held

responsible, to the extent of their involvement in the artificial intelligence, robotics and related technologies concerned, for any injury or harm inflicted upon individuals and society.

- (24) In particular, the developers who take decisions that determine and control the course or manner of the development of artificial intelligence, robotics and related technologies, as well as the deployers who are involved in their deployment with an operating or managing function, should be generally considered responsible for avoiding the occurrence of any such injury or harm, by putting adequate measures in place during the development process and thoroughly respecting such measures during the deployment phase, respectively.
- (25) Socially responsible artificial intelligence, robotics and related technologies, including the software, algorithms and data used or produced by such technologies, can be defined as technologies which both safeguard and promote a number of different aspects of society, most notably democracy, health and economic prosperity, equality of opportunity, workers' and social rights, diverse and independent media and objective and freely available information, allowing for public debate, quality education, cultural and linguistic diversity, gender balance, digital literacy, innovation and creativity. They are also those that are developed, deployed and used having due regard for their ultimate impact on the physical and mental well-being of citizens.
- (26) These technologies should also be developed, deployed and used with a view to supporting social inclusion, plurality, solidarity, fairness, equality and cooperation and their potential in that context should be maximized and explored through research and innovation projects. The Union and its Member States should therefore mobilise their resources for the purpose of supporting and investing in such projects.
- (27) Projects relating to the potential of artificial intelligence, robotics and related technologies to deal with the question of social well-being should be carried out on the basis of responsible research and innovation tools so as to guarantee the compliance with ethical principles of those projects from the outset.
- (28) The development, deployment and use of artificial intelligence, robotics and related technologies, including the software, algorithms and data used or produced by such technologies, should take into consideration their environmental footprint and should not cause harm to the environment during their lifecycle and across their entire supply chain. Accordingly, such technologies should be developed, deployed and used in an environmentally friendly manner that supports the achievement of climate neutrality and circular economy goals.
- (29) For the purposes of this Regulation, developers, deployers and users should be held responsible, to the extent of their involvement in the development, deployment or use of the artificial intelligence, robotics and related technologies concerned, for any harm caused to the environment.

- (30) In particular, the developers who take decisions that determine and control the course or manner of the development of artificial intelligence, robotics and related technologies, as well the deployers who are involved in their deployment with an operating or managing function, should be generally considered responsible for avoiding the occurrence of such harm, namely by respectively putting adequate measures in place during the development process and thoroughly respecting such measures during the deployment phase.
- (31) These technologies should also be developed, deployed and used with a view to supporting the achievement of environmental goals such as reducing waste production, diminishing the carbon footprint, preventing climate change and avoiding environmental degradation, and their potential in that context should be maximized and explored through research and innovation projects. The Union and the Member States should therefore mobilise their resources for the purpose of supporting and investing in such projects.
- (32) Projects relating to the potential of artificial intelligence, robotics and related technologies in addressing environmental concerns should be carried out on the basis of responsible research and innovation tools so as to guarantee from the outset the compliance of those projects with ethical principles.
- (33) Any artificial intelligence, robotics and related technologies, including software, algorithms and data used or produced by such technologies, developed, deployed and used in the Union should fully respect Union citizens' rights to privacy and protection of personal data. In particular, their development, deployment and use should be in accordance with Regulation (EU) 2016/679 of the European Parliament and of the Council¹ and Directive 2002/58/EC of the European Parliament and of the Council².
- (34) The ethical boundaries of the use of artificial intelligence, robotics and related technologies, including software, algorithms and data used or produced by such technologies, should be duly considered when using remote recognition technologies, such as biometric recognition, to automatically identify individuals. When these technologies are used by public authorities during times of national emergency, such as during a national health crisis, the use should be proportionate and criteria for that use defined in order to be able to determine whether, when and how it should take place, and such use should be mindful of its psychological and sociocultural impact with due regard for human dignity and the fundamental rights set out in the Charter.
- (35) Governance that is based on relevant standards enhances safety and promotes the

¹ Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation) (OJ L 119, 4.5.2016, p. 1).

² Directive 2002/58/EC of the European Parliament and of the Council of 12 July 2002 concerning the processing of personal data and the protection of privacy in the electronic communications sector (Directive on privacy and electronic communications) (OJ L 201, 31.7.2002, p. 37).

increase of citizens' trust in the development, deployment and use of artificial intelligence, robotics and related technologies including software, algorithms and data used or produced by such technologies.

- (36) Among the existing relevant governance standards are, for example, the 'Ethics Guidelines for Trustworthy AI' drafted by the High-Level Expert Group on Artificial Intelligence set up by the European Commission, and other technical standards adopted by the European Committee for Standardization (CEN), the European Committee for Electrotechnical Standardization (CENELEC), and the European Telecommunications Standards Institute (ETSI), at European level, the International Organization for Standardization (ISO) and the Institute of Electrical and Electronics Engineers (IEEE), at international level.
- (37) Sharing and use of data by multiple participants is sensitive and therefore the development, deployment and use of artificial intelligence, robotics and related technologies should be governed by relevant standards and protocols reflecting the requirements of quality, integrity, security, privacy and control. The data governance strategy should focus on the processing, sharing of and access to such data, including its proper management and traceability, and guarantee the adequate protection of data belonging to vulnerable groups, including people with disabilities, patients, children, minorities and migrants.
- (38) The effective application of the ethical principles laid down in this Regulation will largely depend on Member States' appointment of an independent public authority to act as a supervisory authority. In particular, each national supervisory authority should be responsible for assessing and monitoring the compliance of artificial intelligence, robotics and related technologies considered a high-risk in light of the obligations set out in this Regulation.
- (39) Each national supervisory authority shall also carry the responsibility of regulating the governance of these technologies. They therefore have an important role to play in promoting the trust and safety of Union citizens, as well as in enabling a democratic, pluralistic and equitable society.
- (40) National supervisory authorities should engage in substantial and regular cooperation with each other, as well as with the European Commission and other relevant institutions, bodies, offices and agencies of the Union, in order to guarantee a coherent cross-border action, and allow for consistent development, deployment and use of these technologies within the Union in compliance with the ethical principles laid down in this Regulation.
- (41) National supervisory authorities should ensure the gathering of a maximum number of stakeholders such as industry, businesses, social partners, researchers, consumers and civil society organisations, and provide a pluralistic forum for reflection and exchange of views so as to achieve comprehensible and accurate conclusions for the purpose of

guiding how governance is regulated.

- (42) Additionally, these national supervisory authorities should provide professional administrative guidance and support to developers, deployers and users, particularly small and medium-sized enterprises or start-ups, encountering challenges as regards complying with the principles laid down in this Regulation.
- (43) Whistle-blowing brings potential and actual breaches of Union law to the attention of authorities with a view to preventing injury, harm or damage that would otherwise occur. In addition, reporting procedures ameliorate the information flow within companies and organisations, thus mitigating the risk of flawed or erroneous products or services being developed. Companies and organisations developing, deploying or using artificial intelligence, robotics and related technologies, including data used or produced by those technologies, should set up reporting channels and persons reporting breaches should be protected from retaliation.
- (44) The rapid development of artificial intelligence, robotics and related technologies, including the software, algorithms and data used or produced by such technologies, as well as of the technical machine learning, reasoning processes and other technologies underlying that development are unpredictable. As such, it is both appropriate and necessary to establish a review mechanism in accordance with which, in addition to its reporting on the application of the Regulation, the Commission is to regularly submit a report concerning the possible modification of the scope of application of this Regulation.
- (45) Since the objective of this Regulation, namely to establish a legal framework of ethical principles for the development, deployment and use of artificial intelligence, robotics and related technologies in the Union, cannot be sufficiently achieved by the Member States, but can rather, by reason of its scale and effects, be better achieved at Union level, the Union may adopt measures, in accordance with the principle of subsidiarity as set out in Article 5 of the Treaty on European Union. In accordance with the principle of proportionality, as set out in that Article, this Regulation does not go beyond what is necessary in order to achieve that objective.
- (46) Action at Union level as set out in this Regulation would be best achieved through the establishment of a European Agency for Artificial Intelligence. Such a body would be essential in coordinating the mandates and actions of the national supervisory authorities in each Member State, outlining objective criteria for the risk assessment of artificial intelligence, robotics and related technologies, developing and issuing a certification of compliance with the ethical principles laid down in this Regulation, supporting regular exchanges with concerned stakeholders and civil society, promoting the Union's approach through international cooperation and ensuring a consistent reply worldwide to the opportunities and risks inherent in these technologies.

HAVE ADOPTED THIS REGULATION:

Article 1

Purpose

The purpose of this Regulation is to establish a regulatory framework of ethical principles for the development, deployment and use of artificial intelligence, robotics and related technologies in the Union.

Article 2

Scope of application

This Regulation applies to artificial intelligence, robotics and related technologies, including software, algorithms and data used or produced by such technologies, developed, deployed or used in the Union.

Article 3

Geographical scope

This Regulation applies to artificial intelligence, robotics and related technologies where any part thereof is developed, deployed or used in the Union, regardless of whether the software, algorithms or data used or produced by such technologies are located outside of the Union or do not have a specific geographical location.

Article 4

Definitions

For the purposes of this Regulation, the following definitions apply:

- (a) ‘artificial intelligence’ means software systems that, inter alia, collect, process and interpret structured or unstructured data, identify patterns and establish models in order to reach conclusions or take actions in the physical or virtual dimension based on such conclusions;
- (b) ‘robotics’ means technologies that enable machines to perform tasks traditionally performed by human beings including by way of artificial intelligence or related technologies;
- (c) ‘related technologies’ means technologies that enable software to control with a partial or full degree of autonomy a physical or virtual process, technologies capable of detecting the identity of persons or specific features of persons by way of their biometric data, and technologies that copy or otherwise make use of human traits;

- (d) ‘software’ means a set of instructions that are expressed in code and necessary for a computer to operate and to execute tasks;
- (e) ‘algorithms’ means a model for calculations or other problem-solving operations carried out by software when executing a task;
- (f) ‘data’ means information defined as and stored in code;
- (g) ‘development’ means the construction and design of algorithms, the writing and design of software or the collection, storing and management of data for the purpose of creating or training artificial intelligence, robotics and related technologies or for the purpose of creating a new application for existing artificial intelligence, robotics and related technologies;
- (h) ‘developer’ means any natural or legal person who takes decisions that determine and control the course or manner of the development of artificial intelligence, robotics and related technologies;
- (i) ‘deployment’ means the operation and management of artificial intelligence, robotics and related technologies, as well as their placement on the market or otherwise making them available to users;
- (j) ‘deployer’ means any natural or legal person who is involved in the deployment of artificial intelligence, robotics and related technologies, and has an operating or managing function;
- (k) ‘use’ means any action relating to artificial intelligence, robotics and related technologies other than development or deployment;
- (l) ‘user’ means any natural or legal person who uses artificial intelligence, robotics and related technologies other than for the purposes of development or deployment;
- (m) ‘bias’ means any prejudiced or partial personal or social perception of a person or group of persons on the basis of their personal traits;
- (n) ‘discrimination’ means any differential treatment of a person or group of persons based on a ground which has no objective or reasonable justification and is therefore prohibited by Union law;
- (o) ‘injury or harm’ means physical, emotional or mental injury, bias, discrimination or stigmatization, suffering caused by a lack of inclusivity and diversity, financial or economic loss, loss of employment or educational opportunity, undue restriction of freedom of choice, wrongful conviction, environmental harm and any infringement of Union law that is detrimental to a person;
- (p) ‘governance’ means the manner of ensuring that the highest standards and the appropriate

protocols of behaviour are adopted and observed by developers, deployers and users, based on a formal set of rules, procedures and values, and which allows them to deal appropriately with ethical matters as or before they arise.

Article 5

Ethical principles of artificial intelligence, robotics and related technologies

1. Any artificial intelligence, robotics and related technologies, including software, algorithms and data used or produced by such technologies, shall be developed, deployed and used in the Union in accordance with the ethical principles laid down in this Regulation.
2. The development, deployment and use of artificial intelligence, robotics and related technologies, including software, algorithms and data used or produced by such technologies, shall be carried out in a manner that ensures that human dignity and the fundamental rights set out in the Charter are fully respected.
3. The development, deployment and use of development, deployment and use of artificial intelligence, robotics and related technologies, including software, algorithms and data used or produced by such technologies, shall be carried out in the best interest of citizens. In particular, the potential of such technologies and the opportunities that they provide shall be taken into consideration having regard at all times to the need to protect and foster the social, environmental and economic well-being of society.

Article 6

Human-centric and human-made artificial intelligence

1. Any artificial intelligence, robotics and related technologies, including software, algorithms and data used or produced by such technologies, shall be developed, deployed and used in a human-centric manner with the aim of contributing to the existence of a democratic, pluralistic and equitable society by safeguarding human autonomy and decision-making and ensuring human agency.
2. The technologies listed in paragraph 1 shall be developed, deployed and used in a manner that guarantees full human oversight at any time, in particular where that development, deployment or use entails a risk of breaching the ethical principles set out in this Regulation.
3. The technologies listed in paragraph 1 shall be developed, deployed and used in a manner that allows human control to be regained at any time, including through the altering or halting of those technologies, when that development, deployment or use entails a risk of breaching the ethical principles set out in this Regulation.

Article 7

Risk assessment

1. For the purposes of this Regulation, artificial intelligence, robotics and related technologies, including software, algorithms and data used or produced by such technologies, which entail a significant risk of breaching the ethical principles set out in this Regulation shall be considered high-risk technologies.

2. Where artificial intelligence, robotics and related technologies are considered high-risk technologies, an assessment of compliance of those technologies with the obligations set out in this Regulation shall be carried out and monitored by the national supervisory authorities referred to in Article 14.

3. Without prejudice to paragraph 1, the risk assessment of artificial intelligence, robotics and related technologies, including software, algorithms and data used or produced by such technologies, shall be carried out on the basis of objective criteria harmonised at Union level and in accordance with applicable sectorial legislation.

Article 8

Safety features, transparency and accountability

1. Any artificial intelligence, robotics and related technologies, including software, algorithms and data used or produced by such technologies, developed, deployed or used in the Union shall be developed, deployed and used in a manner that ensures they do not breach the ethical principles set out in this Regulation. In particular, they shall be:

(a) developed, deployed and used in a consistent manner so that they do not pursue aims or do not carry out activities other than those for which they have been conceived;

(b) developed, deployed and used in a resilient manner so that they ensure an adequate level of security, and one that prevents any technical vulnerabilities from being exploited for unfair or unlawful purposes;

(c) developed, deployed and used in a secure manner that ensures there are safeguards that include a fall-back plan and action in case of a risk of a breach of the ethical principles set out in this Regulation;

(d) developed, deployed and used in a manner that ensures that there is trust that the performance is reliable as regards reaching the aims and carrying out the activities they have been conceived for, including by ensuring that all operations are reproducible;

(e) developed, deployed and used in a manner that ensures that the performance of the aims and activities of the particular technologies is accurate; if occasional inaccuracies cannot be avoided, the system shall indicate the likeliness of errors and inaccuracies to deployers and users through an appropriate disclaimer message;

(f) developed, deployed and used in an easily explainable manner so as to ensure that there can be a review of the technical processes of the technologies;

(g) developed, deployed and used in a manner such that they are capable of warning users that they are interacting with artificial intelligence systems, duly disclosing their capabilities, accuracy and limitations to artificial intelligence developers, deployers and users;

(h) in accordance with Article 6(3), developed, deployed and used in a manner that makes it possible, in the event of non-compliance with the safety features set out in subparagraphs (a) to (g), for the technologies concerned to be temporarily disabled and to revert to historical functionalities.

2. In accordance with Article 6(2), the technologies mentioned in paragraph 1 shall be developed, deployed and used in transparent and traceable manner so that their elements, processes and phases are documented to the highest standards, and that it is possible for the national supervisory authorities referred to in Article 14 to assess the compliance of such technologies with the obligations set out in this Regulation. In particular, the developer, deployer or user of those technologies shall be responsible for, and be able to demonstrate, compliance with the safety features set out in paragraph 1.

3. The developer, deployer or user of the technologies mentioned in paragraph 1 shall ensure that the measures taken to ensure compliance with the safety features set out in paragraph 1 can be audited by the national supervisory authorities referred to in Article 14.

4. Users shall be presumed to have complied with the obligations set out in this Article where their use of artificial, robotics and related technologies, including software, algorithms and data used or produced by such technologies, is carried out in good faith and in no way contravenes the ethical principles laid down in this Regulation.

Article 9

Non-bias and non-discrimination

1. Any software, algorithm or data used or produced by artificial intelligence, robotics and related technologies developed, deployed or used in the Union shall be such as to ensure respect for human dignity and equal treatment for all.

2. Any software, algorithm or data used or produced by artificial intelligence, robotics and related technologies developed, deployed or used in the Union shall be unbiased and, without prejudice to paragraph 3, shall not discriminate on grounds such as race, gender, sexual orientation, pregnancy, disability, physical or genetic features, age, national minority, ethnic or social origin, language, religion or belief, political views or civic participation, citizenship, civil or economic status, education, or criminal record.

3. By way of derogation from paragraphs 1 and 2, and without prejudice to Union law governing unlawful discrimination, any differential treatment between persons or groups of persons may be justified only where there is an objective, reasonable and legitimate aim that is both proportionate and necessary insofar as no alternative exists which would cause less interference with the principle of equal treatment.

Article 10

Social responsibility and gender balance

1. Any artificial intelligence, robotics and related technologies, including software, algorithms and data used or produced by such technologies, shall be developed, deployed and used in the Union in compliance with the relevant Union law, principles and values, in a manner that ensures optimal social, environmental and economic outcomes and that does not result in injury or harm of any kind to being caused to individuals or society.

2. Any artificial intelligence, robotics and related technologies, including software, algorithms and data used or produced by such technologies, developed, deployed or used in the Union shall be developed, deployed and used in a socially responsible manner. In particular, such a manner shall mean that such technologies are:

(a) developed, deployed and used in a manner that contributes to improving individual development, collective well-being and the healthy functioning of democracy, without interfering in political processes, decision-making and elections or contributing to the dissemination of disinformation;

(b) developed, deployed and used in a manner that contributes to the achievement of a fair society by helping to increase citizens' health and well-being, fostering equality in the creation and availability of economic, social and political opportunity and respecting workers' rights;

(c) developed, deployed and used in a manner that contributes to public debate, complements and empowers human cognitive skills, encourages quality education and promotes multilingualism while reflecting the cultural diversity of the Union;

(d) developed, deployed and used in a gender-balanced manner that narrows the gender gap by providing equal opportunities for all;

(e) developed, deployed and used in a manner that contributes to the narrowing of the digital divide among regions, age groups and social classes, the promotion of digital literacy and skills, innovation and creativity, while respecting intellectual property rights;

3. The Union and its Member States shall encourage research projects intended to provide solutions, based on artificial intelligence, robotics and related technologies, that seek to promote social inclusion, plurality, solidarity, fairness, equality and cooperation.

4. The social effects of the ubiquitous presence of artificial intelligence, robotics and related technologies, including software, algorithms and data used or produced by such technologies, developed, deployed or used in the Union shall be monitored by the national supervisory authorities referred to in Article 14, in order to avoid disruptive effects on social agency and social relationships, as well as the deterioration of social skills.

Article 11

Environmental friendliness and sustainability

1. Any artificial intelligence, robotics and related technologies, including software, algorithms and data used or produced by such technologies, shall be developed, deployed or used in the Union in compliance with Union law, principles and values, in a manner that ensures optimal environmentally friendly outcomes and minimises their environmental footprint during their lifecycle and through their entire supply chain, in order to support the achievement of climate neutrality and circular economy goals.

2. The Union and its Member States shall encourage and promote research projects intended to provide solutions, based on artificial intelligence, robotics and related technologies, seeking to address environmental issues such as waste production, the carbon footprint, climate change and environmental degradation.

3. Any artificial intelligence, robotics and related technologies, including software, algorithms and data used or produced by such technologies, shall be assessed as to their environmental friendliness and sustainability by the national supervisory authorities, referred to in Article 14, ensuring that measures are put in place to mitigate their general impact as regards natural resources, energy consumption, waste production, the carbon footprint, climate change and environmental degradation.

Article 12

Privacy and biometric recognition

1. Any processing of personal data carried out in the context of this Regulation, including personal data derived from non-personal data and biometric data, shall be carried out in accordance with Regulation (EU) 2016/679 and Directive 2002/58/EC.

2. In accordance with Article 5(2), where remote recognition technologies, such as biometric recognition, are deployed or used by Member States' public authorities for the purpose of responding to a national emergency, those authorities shall ensure that such deployment or use is limited to specific objectives, restricted in time and carried out with due regard for human dignity and the fundamental rights set out in the Charter.

Article 13

Governance

1. Artificial intelligence, robotics and related technologies developed, deployed or used in the Union shall comply with relevant governance standards established by the national supervisory authorities referred to in Article 14 in accordance with Union law, principles and values.
2. Data used or produced by artificial intelligence, robotics and related technologies developed, deployed or used in the Union shall be managed by developers, deployers and users in accordance with relevant standards referred to in paragraph 1, as well as with relevant industry and business protocols. In particular, developers and deployers shall carry out, where feasible, quality checks of the external sources of data used by artificial intelligence, robotics and related technologies, and shall put oversight mechanisms in place regarding their collection, storage, processing and use.
3. Without prejudice to portability rights and rights of persons whose usage of artificial intelligence, robotics and related technologies has generated data, the collection, storage, processing, sharing of and access to data used or produced by artificial intelligence, robotics and related technologies developed, deployed or used in the Union shall comply with the relevant standards referred to in paragraph 1, as well as with relevant industry and business protocols. In particular, developers and deployers shall ensure those protocols are applied during the development and deployment of artificial intelligence, robotics and related technologies, by clearly defining the requirements for processing and granting access to data used or produced by these technologies, as well as the purpose, scope and addressees of the processing and the granting of access to such data, all of which shall at all times be auditable and traceable.

Article 14

Supervisory authorities

1. Each Member State shall designate an independent public authority to be responsible for monitoring the application of this Regulation ('supervisory authority'). In accordance with Article 7(1) and (2), each national supervisory authority shall be responsible for assessing whether artificial intelligence, robotics and related technologies, including software, algorithms and data used or produced by such technologies, developed, deployed and used in the Union are high-risk technologies and, if so, for assessing and monitoring their compliance with the ethical principles set out in this Regulation.
2. Each national supervisory authority shall contribute to the consistent application of this Regulation throughout the Union. For that purpose, the supervisory authorities in each Member State shall cooperate with each other, the Commission and other relevant institutions, bodies, offices and agencies of the Union, in particular as regards establishing the governance standards referred to in Article 13(1).

3. Each national supervisory authority shall be responsible for supervising the application of governance standards to artificial intelligence, robotics and related technologies, including by liaising with the maximum possible number of stakeholders. For that purpose, the supervisory authorities in each Member State shall provide a forum for regular exchange with stakeholders.

4. Each national supervisory authority shall provide professional and administrative guidance and support on the general implementation of the ethical principles set out in this Regulation, including to small and medium-sized enterprises or start-ups.

5. Each Member State shall notify to the European Commission the legal provisions which it adopts pursuant to this Article by [OJ: please enter the date one year after entry into force] and, without delay, any subsequent amendment affecting them.

6. Member States shall take all measures necessary to ensure the implementation of the ethical principles set out in this Regulation. Member States shall support relevant stakeholders and civil society, at both Union and national level, in their efforts to ensure a timely, ethical and well-informed response to the new opportunities and challenges, in particular those of a cross-border nature, arising from technological developments relating to artificial intelligence, robotics and related technologies.

Article 15

Reporting of breaches and protection of reporting persons

Directive (EU) 2019/1937 of the European Parliament and of the Council³ shall apply to the reporting of breaches of this Regulation and the protection of persons reporting such breaches.

Article 16

Amendment to Directive (EU) No 2019/1937

Directive (EU) No 2019/1937 is amended as follows:

(1) In Article 2(1), the following point is added:

‘(xi) development, deployment and use artificial intelligence, robotics and related technologies.’

(2) In Part I of the Annex, the following point is added:

‘K. Point (a)(xi) of Article 2(1) - development, deployment and use artificial intelligence, robotics and related technologies.

“(xxi) Regulation [XXX] of the European Parliament and of the Council on ethical principles

³ Directive (EU) 2019/1937 of the European Parliament and of the Council of 23 October 2019 on the protection of persons who report breaches of Union law (OJ L 305, 26.11.2019, p. 17).

for the development, deployment and use artificial intelligence, robotics and related technologies”.’

Article 17

Review

The Commission shall keep under regular review the development of artificial intelligence, robotics and related technologies, including the software, algorithms and data used or produced by such technologies, and shall by [OJ: please enter the date three years after entry into force], and every three years thereafter, submit to the European Parliament, the Council and the European Economic and Social Committee a report on the application of this Regulation, including an assessment of the possible modification of the scope of application of this Regulation.

Article 18

Entry into force

1. This Regulation shall enter into force on the twentieth day following that of its publication in the Official Journal of the Union. It shall apply from XX.
2. This Regulation shall be binding in its entirety and directly applicable in the Member States in accordance with the Treaty establishing the European Union.

EXPLANATORY STATEMENT

In 1982 film ‘Blade Runner’, Rachael, a ‘replicant’ who works for a company that manufactures other ‘replicants’ – sentient humanoid robots – says to Deckard, a bounty hunter who makes his living eliminating rogue replicants:

- *‘It seems you feel our work is not a benefit to the public.’*

Deckard replies:

- *‘Replicants are like any other machine - they’re either a benefit or a hazard. If they’re a benefit, it’s not my problem.’*

Benefits and hazards

The mass installation of artificial intelligence in all the machines we interact with in public, the workplace and society will mean – already does mean – a technological sea change comparable only with the transformation heralded by the Industrial Revolution in bygone days. Life will never be the same again, and there will be profound changes in the labour market, in people’s relationship with public authorities, in personal relationships and even in our home environment – think about what the ‘internet of things’ in all the devices in our homes actually means. A technological sea change of such a magnitude places us in the dilemma evoked by *Blade Runner*: any technology has benefits and hazards. And when we broach the issue of artificial intelligence we are talking about benefits and/or risks on a scale previously unimagined, given its intrinsic power.

The EU’s role in establishing a legal framework

When public administrations address this phenomenon we cannot, however, adopt Deckard’s professional cynicism. For the European Parliament it is just as important to harness these technologies’ potential benefits for Europe’s well-being and competitiveness as it is to monitor their inherent risks, or to pre-empt the consequences of the any of those risks actually manifesting itself. We therefore wish to be pioneers in legally establishing an ethical threshold which both protects European citizens from possible drawbacks of this technological shift and provides added value in terms of trust in European artificial intelligence in the world at large. An ethical threshold that is consistent with our European principles and values enshrined in the Charter of Fundamental Rights of the European Union and fully in line with the civilising mission of our project. Our Regulation must be inspired by a humanistic and human-centred approach to technological development. A set of rules that applies not only to artificial intelligence developed in Europe, but that also constitutes a demanding regulatory imperative for anyone intending to operate in the EU.

It is crucial that the set of rights and duties thus established is shared across all the Member States of the European Union. A series of national regulations without a common benchmark could mean the breakdown of the single market and undermine our collective effort to achieve technological leadership in the world. Establishing a European agency responsible for supervising the development of this regulation will lead to the harmonisation of the legal and technical frameworks developed in each Member State.

A flexible and future-oriented Regulation

In response to those who advocate abandoning this sector to self-regulation, the initial dialogue can also serve to illustrate the need for public involvement, with a view to achieving aims that go beyond mere economic profitability: Europe's public institutions must strive to avoid discrimination (regardless of its basis) in the decision-making process and harness these technologies' potential for change so as to advance towards a fairer, more environmentally sustainable society— with special emphasis in eliminating gender-based discrimination – among other objectives. The text provides Europe's public authorities with express mandates to tackle these issues.

This Regulation also aspires to combine a highly ambitious set of requirements with regulatory simplicity, avoiding imposing complicated regulatory systems and/or heavy bureaucratic burdens on the agents involved. It also seeks to establish a sufficiently flexible framework to accommodate progress within an ever-changing reality, while allowing for the development rules in the sector that will shape ever more concrete realities.

A comprehensive approach, including the establishment of national supervisory bodies

This Regulation aims to extend supervision to all areas of a highly complex technology. It includes provisions on development, implementation and the evolution of technology through machine-learning or deep-learning. Special emphasis is placed on prevention when dealing with technologies defined as 'high risk', i.e. those highly likely to cause negative externalities and/or those requiring the use of sensitive materials that warrant special protection (which are also defined in the Regulation). It also regulates the highly sensitive issues of individual rights and remote recognition techniques, establishing many safeguards for their use. A very strict temporary material framework for exceptional circumstances is also laid down for possible use by public authorities in the event of major emergencies.

Another of the Regulation's objectives is to encourage all citizens, especially the persons and groups most involved in or affected by these technologies, to participate in the design, development, control and supervision of this regulatory framework. The text sets out a mandate – which it expressly states is mandatory – for all national supervisory bodies, ensuring that the necessary, constant support of civil society. Similarly, it establishes ambitious requirements in terms of transparency and accountability for the designers, operators and users of artificial intelligence. It also includes obligations for users to behave with due civility and the necessary to ensure they use the technologies in good faith.

Comprehensibility, transparency, accountability, responsibility and governance

We are still a long way from developing an algorithm able to give rise to 'psychohistory', the fictional science in Isaac Asimov's '*Foundation*' series. The concept of free will, an inalienable feature of humanity, does not appear to be in danger at the moment. This remains the case, even though what is at stake is essentially anticipating the emergence of the great currents of history. Our democratic authorities will have to ensure that all decisions, large and small, taken with the assistance of artificial intelligence technologies are not the result of obscure and inaccessible mathematical formulas. Comprehensibility, transparency, accountability and responsibility will be indispensable features of the artificial intelligence that is developed and operated in the European Union.

In a nutshell, the European Union must be an area which maintains the necessary balance between safeguarding the rights of citizens and fostering technological development. Our Regulation and the form it takes as it is developed by the supervisory body or bodies must constitute an example for the rest of the world and the first step towards ensuring adequate governance of this phenomenon at global level.