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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

Rapporteur: Ibán García del Blanco

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Urmas Paet, Committee on Foreign Affairs
Alexandra Geese, Committee on Internal Market and Consumer Protection
Valter Flego, Committee on Transport and Tourism
Assita Kanko, Committee on Civil Liberties, Justice and Home Affairs

(*) Associated committees – Rule 57 of the Rules of Procedure

(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 the Charter of Fundamental Rights of the European Union,

– having regard to Council Regulation (EU) 2018/1488 of 28 September 2018 establishing the European High Performance Computing Joint Undertaking[1],

– having regard to Council Directive 2000/43/EC of 29 June 2000 implementing the principle of equal treatment between persons irrespective of racial or ethnic origin[2] (Racial Equality Directive),

– having regard to Council Directive 2000/78/EC of 27 November 2000 establishing a general framework for equal treatment in employment and occupation[3] (Equal Treatment in Employment Directive),

– having regard to 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)[4] (GDPR), and to Directive (EU) 2016/680 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 by competent authorities for the purposes of the prevention, investigation, detection or prosecution of criminal offences or the execution of criminal penalties, and on the free movement of such data, and repealing Council Framework Decision 2008/977/JHA[5],

– having regard to the Interinstitutional Agreement of 13 April 2016 on Better Law-Making[6],

– 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,

[1] OJ L 252, 8.10.2018, p. 1.
[2] OJ L 180, 19.7.2000, p. 22.
[3] OJ L 303, 2.12.2000, p. 16.
[4] OJ L 119, 4.5.2016, p. 1.
[5] OJ L 119, 4.5.2016, p. 89.
[6] OJ L 123, 12.5.2016, p. 1.

the Council, the European Economic and Social Committee and the Committee of the Regions of 11 December 2019 on The European Green Deal (COM(2019)0640),

– 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 the Council of the European Union's conclusions on Shaping Europe's Digital future of June 2020,

– having regard to its resolution of 16 February 2017 with recommendations to the Commission on Civil Law Rules on Robotics[7],

– having regard to its resolution of 1 June 2017 on digitising European industry[8],

– having regard to its resolution of 12 September 2018 on autonomous weapon systems[9],

– having regard to its resolution of 11 September 2018 on language equality in the digital age[10],

– having regard to its resolution of 12 February 2019 on a comprehensive European industrial policy on artificial intelligence and robotics[11],

– 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 the Council of Europe's Framework Convention for the Protection of National Minorities, Protocol No 12 to the Convention for the Protection of Human

[7] OJ C 252, 18.7.2018, p. 239.
[8] OJ C 307, 30.8.2018, p. 163.
[9] OJ C 433, 23.12.2019, p. 86.
[10] Texts adopted, P8_TA(2018)0332.
[11] Texts adopted, P8_TA(2019)0081.

Rights and Fundamental Freedoms, and the European Charter for Regional or Minority Languages,

– having regard to the OECD Council Recommendation on Artificial Intelligence adopted on 22 May 2019,

– 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 (A9-0186/2020),

Introduction

A. whereas the development, deployment and use of artificial intelligence (also referred to as 'AI'), robotics and related technologies is carried out by humans, and their choices determine the potential of such technologies to benefit society;

B. whereas artificial intelligence, robotics and related technologies that have the potential to generate opportunities for businesses and benefits for citizens and that can directly impact all aspects of our societies, including fundamental rights and social and economic principles and values, as well as have a lasting influence on all areas of activity, are being promoted and developed quickly;

C. whereas artificial intelligence, robotics and related technologies will lead to substantial changes to the labour market and in the workplace; whereas they can potentially replace workers performing repetitive activities, facilitate human-machine collaborative working systems, increase competitiveness and prosperity and create new job opportunities for qualified workers while at the same time posing a serious challenge in terms of reorganisation of the workforce;

D. whereas the development of artificial intelligence, robotics and related technologies can also contribute to reaching the sustainability goals of the European Green Deal in many different sectors; whereas digital technologies can boost the impact of policies as regards environmental protection; whereas they can also contribute to reducing traffic congestion and emissions of greenhouse gases and air pollutants;

E. whereas, for sectors like public transport, AI-supported intelligent transport systems can be used to minimise queuing, optimise routing, enable persons with disabilities to be more independent, and increase energy efficiency thereby enhancing decarbonisation efforts and reducing the environmental footprint;

F. whereas these technologies bring about new business opportunities which can contribute to the recovery of Union industry after the current health and economic crisis if greater use is made of them, for instance, in the transport industry; whereas such opportunities can create new jobs, as the uptake of these technologies has the potential

to increase businesses' productivity levels and contribute to efficiency gains; whereas innovation programs in this area can enable regional clusters to thrive;

G. whereas the Union and its Member States have a particular responsibility to harness, promote and enhance the added value of artificial intelligence and make sure that AI technologies are safe and contribute to the well-being and general interest of their citizens as they can make a huge contribution to reaching the common goal of improving the lives of citizens and fostering prosperity within the Union by contributing to the development of better strategies and innovation in a number of areas and sectors; whereas, in order to exploit the full potential of artificial intelligence and make users aware of the benefits and challenges that AI technologies bring, it is necessary to include AI or digital literacy in education and training, including in terms of promoting digital inclusion, and to conduct information campaigns at Union level that give an accurate representation of all aspects of AI development;

H. whereas a common Union regulatory framework for the development, deployment and use of artificial intelligence, robotics and related technologies (‘regulatory framework for AI’) should allow citizens to share the benefits drawn from their potential, while protecting citizens from the potential risks of such technologies and promoting the trustworthiness of such technologies in the Union and elsewhere; whereas that framework should be based on Union law and values and guided by the principles of transparency and explainability, fairness, accountability and responsibility;

I. whereas such a regulatory framework is of key importance in avoiding the fragmentation of the Internal Market, resulting from differing national legislation and will help foster much needed investment, develop data infrastructure and support research; whereas it should consist of common legal obligations and ethical principles as set out in the proposal for a Regulation requested in the annex to this resolution; whereas it should be established according to the better regulation guidelines;

J. whereas the Union has a strict legal framework in place to ensure, inter alia, the protection of personal data and privacy and non-discrimination, to promote gender equality, environmental protection and consumers’ rights; whereas such a legal framework consisting of an extensive body of horizontal and sectoral legislation , including the existing rules on product safety and liability, will continue to apply in relation to artificial intelligence, robotics and related technologies, although certain adjustments of specific legal instruments may be necessary to reflect the digital transformation and address new challenges posed by the use of artificial intelligence;

K. whereas there are concerns that the current Union legal framework, including the consumer law and employment and social acquis, data protection legislation, product safety and market surveillance legislation, as well as antidiscrimination legislation may no longer be fit for purpose to effectively tackle the risks created by artificial intelligence, robotics and related technologies;

L. whereas in addition to adjustments to existing legislation, legal and ethical questions relating to AI technologies should be addressed through an effective, comprehensive and future-proof regulatory framework of Union law reflecting the Union’s principles and values as enshrined in the Treaties and the Charter of Fundamental Rights that

should refrain from over-regulation, by only closing existing legal loopholes, and increase legal certainty for businesses and citizens alike, namely by including mandatory measures to prevent practices that would undoubtedly undermine fundamental rights;

M. whereas any new regulatory framework needs to take into consideration all the interests at stake; whereas careful examination of the consequences of any new regulatory framework on all actors in an impact assessment should be a prerequisite for further legislative steps; whereas the crucial role of Small- and Medium sized enterprises (SMEs) and start-ups especially in the Union economy justifies a strictly proportionate approach to enable them to develop and innovate;

N. whereas artificial intelligence, robotics and related technologies can have serious implications for the material and immaterial integrity of individuals, groups, and society as a whole, and potential individual and collective harm must be addressed with legislative responses;

O. whereas, in order to respect a Union's regulatory framework for AI, specific rules for the Union's transport sector may need to be adopted;

P. whereas AI technologies are of strategic importance for the transport sector, including due to them raising the safety and accessibility of all modes of transport, and creating new employment opportunities and more sustainable business models; whereas a Union approach to the development of artificial intelligence, robotics and related technologies in transport has the potential to increase the global competitiveness and strategic autonomy of the Union economy;

Q. whereas human error is still involved in about 95% of all road traffic accidents in the Union; whereas the Union aimed to reduce annual road fatalities in the Union by 50% by 2020 compared to 2010, but, in view of stagnating progress, renewed its efforts in its Road Safety Policy Framework 2021 - 2030 - Next steps towards "Vision Zero"; whereas in this regard, AI, automation and other new technologies have great potential and vital importance for increasing road safety by reducing the possibilities for human error;

R. whereas the Union's regulatory framework for AI should also reflect the need to ensure that workers' rights are respected; whereas regard should be had to the European Social Partners Framework Agreement on Digitalisation of June 2020;

S. whereas the scope of the Union's regulatory framework of AI should be adequate, proportionate and thoroughly assessed; whereas it should cover a wide range of technologies and their components, including algorithms, software and data used or produced by them, a targeted risk-based approach is necessary to avoid hampering future innovation and the creation of unnecessary burdens, especially for SMEs; whereas the diversity of applications driven by artificial intelligence, robotics and related technologies complicates finding a single solution suitable for the entire spectrum of risks;

T. whereas data analysis and AI increasingly impact on the information made accessible to citizens; whereas such technologies, if misused, may endanger fundamental rights to

freedom of expression and information as well as media freedom and pluralism;

U. whereas the geographical scope of the Union's regulatory framework for AI 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;

V. whereas the Union's regulatory framework for AI should encompass all relevant stages, namely the development, the deployment and the use of the relevant technologies and their components, requiring due consideration of the relevant legal obligations and ethical principles and should set the conditions to make sure that developers, deployers and users are fully compliant with such obligations and principles;

W. whereas a harmonised approach to ethical principles relating to artificial intelligence, robotics and related technologies requires a common understanding in the Union of the concepts that form the basis of the technologies such as algorithms, software, data or biometric recognition;

X. whereas action at Union level is justified by the need to avoid regulatory fragmentation or a series of national regulatory provisions with no common denominator and to ensure a homogenous application of common ethical principles enshrined in law when developing, deploying and using high-risk artificial intelligence, robotics and related technologies; whereas clear rules are needed where the risks are significant;

Y. whereas common ethical principles are only efficient where they are also enshrined in law, and those responsible for ensuring, assessing and monitoring compliance are identified;

Z. whereas ethical guidance, such as the principles adopted by the High-Level Expert Group on Artificial Intelligence, provides a good starting point but cannot ensure that developers, deployers and users act fairly and guarantee the effective protection of individuals; whereas such guidance is all the more relevant with regard to high-risk artificial intelligence, robotics and related technologies;

AA. whereas each Member State should designate a national supervisory authority responsible for ensuring, assessing and monitoring the compliance of the development, deployment and use of high-risk artificial intelligence, robotics and related technologies with the Union's regulatory framework for AI; and for allowing discussions and exchanges of views in close cooperation with relevant stakeholders and civil society; whereas national supervisory authorities should cooperate with each other;

AB. whereas in order to ensure a harmonised approach across the Union and the optimal functioning of the Digital Single Market, coordination at Union level by the Commission, and any/or relevant institutions, bodies, offices and agencies of the Union that may be designated in this context, should be assessed as regards the new opportunities and challenges, in particular those of a cross-border nature, arising from ongoing technological developments; whereas, to this end, the Commission should be tasked with finding an appropriate solution to structure such coordination at Union level;

Human-centric and human-made artificial intelligence

1. Takes the view that, without prejudice to sector-specific legislation, an effective and harmonised regulatory framework based on Union law, the Charter of fundamental rights of the European Union ('Charter') and international human rights law, and applicable, in particular, to high-risk technologies, is necessary in order to establish equal standards throughout the Union and effectively protect Union values;

2. Believes that any new regulatory framework for AI consisting of legal obligations and ethical principles for the development, deployment and use of artificial intelligence, robotics and related technologies should fully respect the Charter and thereby respect human dignity, autonomy and self-determination of the individual, prevent harm, promote fairness, inclusion and transparency, eliminate biases and discrimination, including as regards minority groups, and respect and comply with the principles of limiting the negative externalities of technology used, of ensuring explainability of technologies, and of guaranteeing that the technologies are there to serve people and not replace or decide for them, with the ultimate aim of increasing every human being's well-being;

3. Emphasises the asymmetry between those who employ AI technologies and those who interact and are subject to them; in this context, stresses that citizens' trust in AI can only be built on an ethics-by-default and ethics-by-design regulatory framework which ensures that any AI put into operation fully respects and complies with the Treaties, the Charter and secondary Union law; considers that building on such an approach should be in line with the precautionary principle that guides Union legislation and should be at the heart of any regulatory framework for AI; calls, in this regard, for a clear and coherent governance model that allows companies and innovators to further develop artificial intelligence, robotics and related technologies;

4. Believes that any legislative action related to artificial intelligence, robotics and related technologies should be in line with the principles of necessity and proportionality;

5. Considers that such an approach will allow companies to introduce innovative products onto the market and create new opportunities while ensuring the protection of Union values by leading to the development of AI systems which incorporate Union ethical principles by design; considers that such a values-based regulatory framework would represent added value by providing the Union with a unique competitive advantage and make a significant contribution to the well-being and prosperity of Union citizens and businesses by boosting the internal market; underlines that such a regulatory framework for AI will also represent added value as regards promoting innovation in the internal market; believes that for example, in the transport sector, this approach presents Union businesses with the opportunity to become global leaders in this area;

6. Notes that the Union's legal framework should apply to artificial intelligence, robotics and related technologies, including software, algorithms and data used or produced by such technologies;

7. Notes that the opportunities based on artificial intelligence, robotics and related technologies rely on 'Big Data', with a need for a critical mass of data to train algorithms and refine results; welcomes in this regard the Commission's proposal for the creation of a

common data space in the Union to strengthen data exchange and support research in full respect of European data protection rules;

8. Considers that the current Union legal framework, in particular on protection and privacy and personal data, will need to fully apply to AI, robotics, and related technologies and needs to be reviewed and scrutinized on a regular basis and updated where necessary in order to effectively tackle the risks created by these technologies, and, in this regard, could benefit from being supplemented with robust guiding ethical principles; points out that, where it would be premature to adopt legal acts, a soft law framework should be used;

9. Expects the Commission to integrate a strong ethical approach into the legislative proposal requested in the annex to this resolution as a follow up to the White Paper on Artificial Intelligence, including on safety, liability, fundamental rights, which maximises the opportunities and minimises the risks of AI technologies; expects that the legislative proposal requested will include policy solutions to the major recognised risks of artificial intelligence including, amongst others, on the ethical collection and use of Big Data, the issue of algorithmic transparency and algorithmic bias; calls on the Commission to develop criteria and indicators to label AI technology in order to stimulate transparency, explainability, and accountability and incentivise the taking of additional precautions by developers; stresses the need to invest in integrating non-technical disciplines in AI study and research taking into account the social context;

10. Considers that artificial intelligence, robotics and related technologies must be tailored to human needs in line with the principle whereby their development, deployment and use should always be at the service of human beings and never the other way round, and should seek to enhance well-being and individual freedom, as well as preserve peace, prevent conflicts and strengthen international security, while at the same time maximising the benefits offered and preventing and reducing its risks;

11. Declares that the development, deployment and use of high-risk artificial intelligence, robotics and related technologies, including but not exclusively by human beings, should always be ethically guided, and designed to respect and allow for human agency and democratic oversight, as well as allow the retrieval of human control when needed by implementing appropriate control measures;

Risk assessment

12. Stresses that any future regulation should follow a differentiated and future oriented risk-based approach to regulating artificial intelligence, robotics and related technologies, including technology-neutral standards across all sectors, with sector-specific standards where appropriate; notes that, in order to ensure uniform implementation of the system of risk assessment and that there is compliance with related legal obligations to ensure a level-playing field among the Member States and to prevent fragmentation of the internal market, an exhaustive and cumulative list of high-risk sectors and high-risk uses or purposes is needed; stresses that such a list must be the subject of regular re-evaluation and notes that, given the evolving nature of these technologies, the way in which their risk assessment is carried out may need to be reassessed in the future;

13. Considers that the determination of whether artificial intelligence, robotics and related

technologies should be considered high-risk, and thus subject to mandatory compliance with legal obligations and ethical principles as set out in the regulatory framework for AI, should always follow from an impartial, regulated and external ex-ante assessment based on concrete and defined criteria;

14. Considers, in that regard, that artificial intelligence, robotics and related technologies should be considered high-risk when their development, deployment and use entail a significant risk of causing injury or harm to individuals or society, in breach of fundamental rights and safety rules as laid down in Union law; considers that, for the purposes of assessing whether AI technologies entail such a risk, the sector where they are developed, deployed or used, their specific use or purpose and the severity of the injury or harm that can be expected to occur should be taken into account; the first and two criteria, namely the sector and the specific use or purpose, should be considered cumulatively;

15. Underlines that the risk assessment of these technologies should be done on the basis of an exhaustive and cumulative list of high-risk sectors and high-risk uses and purposes; strongly believes that there should be coherence within the Union when it comes to the risk assessment of these technologies, especially when they are assessed both in light of their compliance with the regulatory framework for AI and in accordance with any other applicable sector-specific legislation;

16. Considers that this risk-based approach should be developed in a way that limits the administrative burden for companies, and SMEs in particular, as much as possible by using existing tools; such tools include but are not limited to the Data Protection Impact Assessment list as provided for in Regulation (EU) 2016/679;

Safety features, transparency and accountability

17. Recalls that the right to information of consumers is anchored as a key principle under Union law and underlines that it therefore should be fully implemented in relation to artificial intelligence, robotics and related technologies; opines it should especially encompass transparency regarding interaction with artificial intelligence systems, including automation processes, and regarding their mode of functioning, capabilities, for example how information is filtered and presented, accuracy and limitations; considers that such information should be provided to the national supervisory authorities and national consumer protection authorities;

18. Underlines that consumer trust is essential for the development and implementation of these technologies, which can carry inherent risks when they are based on opaque algorithms and biased data sets; believes that consumers should have the right to be adequately informed in an understandable, timely, standardised, accurate and accessible manner about the existence, reasoning, possible outcome and impacts for consumers of algorithmic systems, about how to reach a human with decision-making powers, and about how the system's decisions can be checked, meaningfully contested and corrected; underlines, in this regard, the need to consider and respect the principles of information and disclosure on which the consumer acquis has been built; considers it necessary to provide detailed information to end-users regarding the operation of transport systems and AI-supported vehicles;

19. Notes that it is essential that the algorithms and data sets used or produced by artificial intelligence, robotics, and related technologies are explainable and, where strictly necessary and in full respect of Union legislation on data protection, privacy and intellectual property rights and trade secrets, accessible by public authorities such as national supervisory authorities and market surveillance authorities; further notes that, in accordance with the highest possible and applicable industry standards, documentation should be stored by those who are involved in the different stages of the development of high-risk technologies; notes the possibility that market surveillance authorities may have additional prerogatives in that respect; stresses in this respect the role of lawful reverse-engineering; considers that an examination of the current market surveillance legislation might be necessary to ensure that it responds ethically to the emergence of artificial intelligence, robotics and related technologies;

20. Calls for a requirement for developers and deployers of high-risk technologies to, where a risk assessment so indicates, provide public authorities with the relevant documentation on the use and design and safety instructions, including, when strictly necessary and in full respect of Union legislation on data protection, privacy, intellectual property rights and trade secrets, source code, development tools and data used by the system; notes that such an obligation would allow for the assessment of their compliance with Union law and ethical principles and notes, in that respect, the example provided by the legal deposit of publications of a national library; notes the important distinction between transparency of algorithms and transparency of the use of algorithms;

21. Further notes that, in order to respect human dignity, autonomy and safety, due consideration should be given to vital and advanced medical appliances and the need for independent trusted authorities to retain the means necessary to provide services to persons carrying these appliances, where the original developer or deployer no longer provides them; for example; such services would include maintenance, repairs and enhancements, including software updates that fix malfunctions and vulnerabilities;

22. Maintains that high-risk artificial intelligence, robotics and related technologies, including the software, algorithms and data used or produced by such technologies, regardless of the field in which they are developed, deployed and used, should be developed by design in a secure, traceable, technically robust, reliable, ethical and legally binding manner and be subject to independent control and oversight; considers especially that all players throughout the development and supply chains of artificial intelligence products and services should be legally accountable and highlights the need for mechanisms to ensure liability and accountability;

23. Underlines that regulation and guidelines concerning explainability, auditability, traceability, and transparency, as well, where so required by a risk assessment, and strictly necessary and while fully respecting Union law such as that concerning data protection, privacy, intellectual property rights and trade secrets, as access by public authorities to technology, data and computing systems underlying such technologies, are essential to ensuring citizens' trust in those technologies, even if the degree of explainability is relative to the complexity of the technologies; points out that it is not always possible to explain why a model has led to a particular result or decision, black box algorithms being a case in point; considers, therefore, that the respect of these

principles is a precondition to guarantee accountability;

24. Considers that citizens, including consumers, should be informed when interacting with a system using artificial intelligence in particular to personalise a product or service to its users, whether and how they can switch off or restrain the personalisation;

25. Points out in this regard that, if they are to be trustworthy, artificial intelligence, robotics and their related technologies must be technically robust and accurate;

26. Stresses that the protection of networks of interconnected AI and robotics is important and strong measures must be taken to prevent security breaches, data leaks, data poisoning, cyber-attacks and the misuse of personal data, and that this will require the relevant agencies, bodies and institutions both at Union and national level to work together and in cooperation with end users of these technologies; calls on the Commission and Member States to ensure that Union values and respect for fundamental rights are observed at all times when developing and deploying AI technology in order to ensure the security and resilience of the Union's digital infrastructure;

Non-bias and non-discrimination

27. Recalls that artificial intelligence, depending on how it is developed and used, has the potential to create and reinforce biases, including through inherent biases in the underlying datasets, and therefore, create various forms of automated discrimination, including indirect discrimination, concerning in particular groups of people with similar characteristics; calls on the Commission and the Member States to take any possible measure to avoid such biases and to ensure the full protection of fundamental rights;

28. Is concerned by the risks of biases and discrimination in the development, deployment and use of high-risk artificial intelligence, robotics and related technologies, including the software, algorithms and data used or produced by such technologies; recalls that, in all circumstances, they should respect Union law, as well as human rights and dignity, and autonomy and self-determination of the individual, and ensure equal treatment and non-discrimination for all;

29. Stresses that AI technologies should be designed to respect, serve and protect Union values and physical and mental integrity, uphold the Union's cultural and linguistic diversity and help satisfy essential needs; underlines the need to avoid any use that might lead to inadmissible direct or indirect coercion, threaten to undermine psychological autonomy and mental health or lead to unjustified surveillance, deception or inadmissible manipulation;

30. Firmly believes that the fundamental human rights enshrined in the Charter should be strictly respected so as to ensure that these emerging technologies do not create gaps in terms of protection;

31. Affirms that possible bias in and discrimination by software, algorithms and data can cause manifest harm to individuals and to society, therefore they should be addressed by encouraging the development and sharing of strategies to counter these, such as de-biasing datasets in research and development, and by the development of rules on data

processing; considers this approach to have the potential to turn software, algorithms and data into an asset in fighting bias and discrimination in certain situations, and a force for equal rights and positive social change;

32. Maintains that ethical values of fairness, accuracy, confidentiality and transparency should be the basis of these technologies, which in this context entails that their operations should be such that they do not generate biased outputs;

33. Underlines the importance of the quality of data sets used for artificial intelligence, robotics and related technologies depending on their context, especially regarding the representativeness of the training data, on the de-biasing of data sets, on the algorithms used, and on data and aggregation standards; stresses that those data sets should be auditable by national supervisory authorities whenever called upon to ensure their conformity with the previously referenced principles;

34. Highlights that, in the context of the widespread disinformation war, particularly driven by non-European actors, AI technologies might have ethically adverse effects by exploiting biases in data and algorithms or by deliberately altering learning data by a third country, and could be also exposed to other forms of dangerous malign manipulation in unpredictable ways and with incalculable consequences; there is therefore an increased need for the Union to continue investment in research, analysis, innovation and cross-border and cross-sector knowledge transfer in order to develop AI technologies that would be clearly free of any sort of profiling, bias and discrimination, and could effectively contribute to combating fake news and disinformation, while at the same time respecting data privacy and the Union's legal framework;

35. Recalls the importance of ensuring effective remedies for individuals and calls on the Member States to ensure that accessible, affordable, independent and effective procedures and review mechanisms are available to guarantee an impartial human review of all claims of violations of citizens' rights, such as consumer or civil rights, through the use of algorithmic systems, whether stemming from public or private sector actors; underlines the importance of the draft Directive of the European Parliament and of the Council on representative actions for the protection of the collective interests of consumers and repealing Directive 2009/22/EC on which a political agreement was reached on 22 June 2020, as regards future cases challenging the introduction or ongoing use of a AI system entailing a risk of violating consumer rights, or seeking remedies for a violation of rights; asks the Commission and the Member States to ensure that national and Union consumer organisations have sufficient funding to assist consumers in exercising their right to a remedy in cases where their rights have been violated;

36. Considers therefore that any natural or legal person should be able to seek redress for a decision made by artificial intelligence, robotics or related technology to his or her detriment in breach of Union or national law;

37 Considers that, as a first point of contact in cases of suspected breaches of the Union's regulatory framework in this context, national supervisory authorities could equally be addressed by consumers with requests for redress in view of ensuring the effective enforcement of the aforementioned framework;

Social responsibility and gender balance

38. Emphasises that socially responsible artificial intelligence, robotics and related technologies have a role to play in contributing to finding solutions that safeguard and promote fundamental rights and values of our society such as democracy, the rule of law, diverse and independent media and objective and freely available information, health and economic prosperity, equality of opportunity, workers' and social rights, quality education, protection of children, cultural and linguistic diversity, gender equality, digital literacy, innovation and creativity; recalls the need to ensure that the interests of all citizens, including those who are marginalised or in vulnerable situations, such as persons with disabilities, are adequately taken into account and represented;

39. Underlines the importance of achieving a high level of overall digital literacy and training highly skilled professionals in this area as well as ensuring the mutual recognition of such qualifications throughout the Union; highlights the need of having diverse teams of developers and engineers working alongside key societal actors to prevent gender and cultural biases being inadvertently included in AI algorithms, systems and applications; supports the creation of educational curricula and public-awareness activities concerning the societal, legal, and ethical impact of artificial intelligence;

40. Stresses the vital importance of guaranteeing freedom of thought and expression, thus ensuring that these technologies do not promote hate speech or violence thus considers hindering or restricting freedom of expression exercised digitally to be unlawful under the fundamental principles of the Union, except where the exercise of this fundamental right entails illegal acts;

41. Stresses that artificial intelligence, robotics and related technologies can contribute to reducing social inequalities and asserts that the European model for their development must be based on citizens' trust and greater social cohesion;

42. Stresses that the deployment of any artificial intelligence system should not unduly restrict users' access to public services such as social security; therefore calls on the Commission to assess how this objective can be achieved;

43. Stresses the importance of responsible research and development aiming at maximizing the full potential of artificial intelligence, robotics and related technologies for citizens and public good; calls for mobilisation of resources by the Union and its Member States in order to develop and support responsible innovation;

44. Stresses that technological expertise will be increasingly important and it will therefore be necessary to update continuously training courses, in particular for future generations, and to promote the vocational retraining of those already in the labour market; maintains, in this regard, that innovation and training should be promoted not only in the private sector but also in the public sector;

45. Insists that the development, deployment and use of these technologies should not cause injury or harm of any kind to individuals or society or the environment and that, accordingly, developers, deployers and users of these technologies should be held responsible for such injury or harm in accordance with the relevant Union and national liability rules;

46. Calls on Member States to assess whether job losses resulting from the deployment of

these technologies should lead to appropriate public policies such as a reduction of working time;

47. Maintains that a design approach based on Union values and ethical principles is strongly needed to create the conditions for widespread social acceptance of artificial intelligence, robotics and related technologies; considers this approach, aimed at developing trustworthy, ethically responsible and technically robust artificial intelligence, to be an important enabler for sustainable and smart mobility that is safe and accessible;

48. Draws attention to the high added value provided by autonomous vehicles for persons with reduced mobility, as such vehicles allow such persons to participate more effectively in individual road transport and thereby facilitate their daily lives; stresses the importance of accessibility, especially when designing MaaS-systems (Mobility as a Service);

49. Calls on the Commission to further support the development of trustworthy AI systems in order to render transport safer, more efficient, accessible, affordable and inclusive, including for persons with reduced mobility, particularly persons with disabilities, taking account of Directive (EU) 2019/882 of the European Parliament and of the Council1 and of Union law on passenger rights;

50. Considers that AI can help to better utilise the skills and competences of people with disabilities and that the application of AI in the workplace can contribute to inclusive labour markets and higher employment rates for people with disabilities;

Environment and sustainability

51. States that artificial intelligence, robotics and related technologies should be used by governments and businesses to benefit the people and the planet, contribute to the achievement of sustainable development, the preservation of the environment, climate neutrality and circular economy goals; the development, deployment and use of these technologies should contribute to the green transition, preserve the environment, and minimise and remedy any harm caused to the environment during their lifecycle and across their entire supply chain in line with Union law;

52. Given their significant environmental impact, for the purposes of the previous paragraph, the environmental impact of developing, deploying and using artificial intelligence, robotics and related technologies could, where relevant and appropriate, be evaluated throughout their lifetime by sector specific authorities; such evaluation could include an estimate of the impact of the extraction of the materials needed, and the energy consumption and the greenhouse gas emissions caused, by their development, deployment and use;

53. Proposes that for the purpose of developing responsible cutting-edge artificial intelligence solutions, the potential of artificial intelligence, robotics and related technologies should be explored, stimulated and maximized through responsible research and development that requires the mobilisation of resources by the Union and its Member States;

54. Highlights the fact that the development, deployment and use of these technologies provide opportunities for promotion of the Sustainable Development Goals outlined by

the United Nations, global energy transition and decarbonisation;

55. Considers that the objectives of social responsibility, gender balance, environmental protection and sustainability should be without prejudice to existing general and sectorial obligations within these fields; believes that non-binding implementation guidelines for developers, deployers and users, especially of high-risk technologies, regarding the methodology for assessing their compliance with this Regulation and the achievement of those objectives should be established;

56. Calls on the Union to promote and fund the development of human-centric artificial intelligence, robotics and related technologies that address environment and climate challenges and that ensure the respect for fundamental rights through the use of tax, procurement, or other incentives;

57. Stresses that, despite the current high carbon footprint of development, deployment and use of artificial intelligence, robotics and related technologies, including automated decisions and machine learning, those technologies can contribute to the reduction of the current environmental footprint of the ICT sector; underlines that these and other properly regulated related technologies should be critical enablers for attaining the goals of the Green Deal, the UN Sustainable Development Goals and the Paris Agreement in many different sectors and should boost the impact of policies delivering environmental protection, for example policies concerning waste reduction and environmental degradation;

58. Calls on the Commission to carry out a study on the impact of AI technology's carbon footprint and the positive and negative impacts of the transition to the use of AI technology by consumers;

59. Notes that, given the increasing development of AI applications, which require computational, storage and energy resources, the environmental impact of AI systems should be considered throughout their lifecycle;

60. Considers that in areas such as health, liability must ultimately lie with a natural or legal person; emphasises the need for traceable and publicly available training data for algorithms;

61. Strongly supports the creation of a European Health Data Space[12] proposed by the Commission which aims at promoting health-data exchange and at supporting research in full respect of data protection, including processing data with AI technology, and which strengthens and extends the use and re-use of health data; encourages the upscaling of cross-border exchange of health data, the linking and use of such data through secure, federated repositories, specific kinds of health information, such as European Health Records (EHRs), genomic information, and digital health images to facilitate Union-wide interoperable registers or databases in areas such as research, science and health sectors;

62. Highlights the benefits of AI for disease prevention, treatment and control, exemplified by AI predicting the COVID19 epidemic before the WHO; urges the Commission to

[12] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions - A European strategy for data, COM(2020)0066

adequately equip ECDC with the regulatory framework and resources for gathering necessary anonymised real-time global health data independently in conjunction with the Member States, so as, among other purposes, to address issues revealed by the COVID19 crisis;

Privacy and biometric recognition

63. 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 and enforce the rights of citizens to privacy and protection of personal data in line with Union law;

64. Points out that the possibility provided by these technologies for using personal and non-personal data to categorise and micro-target people, identify vulnerabilities of individuals, or exploit accurate predictive knowledge, has to be counterweighted by effectively enforced data protection and privacy principles such as data minimisation**,** the right to object to profiling and control the use of one's data, 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 strictly identified purposes in compliance with GDPR;

65. Emphasises that when remote recognition technologies, such as recognition of biometric features, notably facial recognition, are used by public authorities, for substantial public interest purposes, their use should always be disclosed, proportionate, targeted and limited to specific objectives, restricted in time in accordance with Union law and have due regard for human dignity and autonomy and the fundamental rights set out in the Charter. Criteria for and limits to that use should be subject to judicial review and democratic scrutiny and should take into account its psychological and sociocultural impact on civil society;

66. Points out that while deploying artificial intelligence, robotics and related technologies within the framework of public power decisions has benefits, it can result in grave misuse, such as mass surveillance, predictive policing and breaches of due process rights;

67. Considers that technologies which can produce automated decisions, thus replacing decisions taken by public authorities, should be treated with the utmost precaution , notably in the area of justice and law enforcement;

68. Believes that Member States should have recourse to such technologies only if there is thorough evidence of their trustworthiness and if meaningful human intervention and review is possible or systematic in cases where fundamental liberties are at stake; underlines the importance for national authorities to undertake strict fundamental rights impact assessment for artificial intelligence systems deployed in these cases, especially following the assessment of those technologies as high-risk;

69. Is of the opinion that any decision taken by artificial intelligence, robotics or related technologies within the framework of prerogatives of public power should be subject to meaningful human intervention and due process, especially following the assessment of

those technologies as high-risk;

70. Believes that the technological advancement should not lead to the use of artificial intelligence, robotics and related technologies to autonomously take public sector decisions which have a direct and significant impact on citizen's rights and obligations;

71. Notes that AI, robotics and related technologies in the area of law enforcement and border control could enhance public safety and security, but also needs extensive and rigorous public scrutiny and the highest possible level of transparency both with regards to the risk assessment of individual applications, as well as a general overview of the use of AI, robotics and related technologies in the area of law enforcement and border control; considers that such technologies bear significant ethical risks that must be adequately addressed, considering the possible adverse effects on individuals when it comes, in particular to their rights to privacy, data protection and non-discrimination; stresses that their misuse can become a direct threat to democracy and that their deployment and use must respect the principles of proportionality and necessity, the Charter of Fundamental Rights, as well as the relevant secondary Union law, such as data protection rules; stresses that AI should never replace humans in issuing judgments; considers that decisions, such as getting bail or probation, that are heard in court, or decisions based solely on automated processing producing a legal effect concerning the individual or which significantly affect them, must always involve meaningful assessment and human judgement;

Good governance

72. Stresses that appropriate governance of the development, deployment and use of artificial intelligence, robotics and related technologies, especially high-risk technologies by having measures in place focusing on accountability and addressing potential risks of bias and discrimination, can increase citizens' safety and trust in those technologies;

73. Considers that a common framework for the governance of these technologies, coordinated by the Commission and/or any relevant institutions, bodies, offices or agencies of the that may be designated for this task in this context, to be implemented by national supervisory authorities in each Member State, would ensure a coherent European approach and prevent a fragmentation of the single market;

74. Observes that data are used in large volumes in the development of artificial intelligence, robotics and related technologies and that the processing, sharing of**,** access to and use of such data must be governed in accordance with the law and the requirements of quality, integrity, interoperability, transparency, security, privacy and control set out therein;

75. Recalls that access to data is an essential component in the growth of the digital economy; points out in this regard that interoperability of data, by limiting lock-in effects, plays a key role in ensuring fair market conditions and promoting a level playing field in the Digital Single Market;

76. Underlines the need to ensure that personal data is protected adequately, especially data on, or stemming from, vulnerable groups, such as people with disabilities, patients,

children, the elderly, minorities, migrants and other groups at risk of exclusion;

77. Notes that the development, deployment and use of artificial intelligence, robotics and related technologies by public authorities are often outsourced to private parties; considers that this should not compromise the protection of public values and fundamental rights in any way; considers that public procurement terms and conditions should reflect the ethical standards imposed on public authorities, when applicable;

Consumers and the internal market

78. Underlines the importance of a regulatory framework for AI being applicable where consumers within the Union are users of, subject to, targeted by, or directed towards an algorithmic system, irrespective of the place of establishment of the entities that develop, sell or employ the system; furthermore, believes that, in the interest of legal certainty, the rules set out in such a framework should apply to all developers and across the value chain, namely the development, deployment and use of the relevant technologies and their components, and should guarantee a high level of consumer protection;

79. Notes the intrinsic link between artificial intelligence, robotics and related technologies, including software, algorithms and data used or produced by such technologies, and fields such as the internet of things, machine learning, rule based systems or automated and assisted decision making processes; further notes that standardised icons could be developed to help explain such systems to consumers whenever those systems are characterised by complexity or are enabled to make decisions that impact the lives of consumers significantly;

80. Recalls that the Commission should examine the existing legal framework and its application, including the consumer law *acquis*, product liability legislation, product safety legislation and market surveillance legislation, in order to identify legal gaps, as well as existing regulatory obligations; considers that this is necessary in order to ascertain whether it is able to respond to the new challenges posed by the emergence of artificial intelligence, robotics and related technologies and ensure a high level of consumer protection;

81. Stresses the need to effectively address the challenges created by artificial intelligence, robotics and related technologies and to ensure that consumers are empowered and properly protected; underlines the need to look beyond the traditional principles of information and disclosure on which the consumer *acquis* has been built, as stronger consumer rights and clear limitations regarding the development, deployment and use of artificial intelligence, robotics and related technologies will be necessary to ensure such technology contributes to making consumers' lives better and evolves in a way that respects fundamental and consumer rights and Union values;

82. Points out that the legislative framework introduced by Decision No 768/2008/EC provides for a harmonised list of obligations for producers, importers and distributors, encourages the use of standards and provides for several levels of control depending on the dangerousness of the product; considers that that framework should also apply to AI embedded products;

83. Notes that for the purpose of analysing the impacts of artificial intelligence, robotics and

related technologies on consumers, access to data could, when in full respect of Union law, such as that concerning data protection, privacy and trade secrets, be extended to national competent authorities ; recalls the importance of educating consumers to be more informed and skilled when dealing with artificial intelligence, robotics and related technologies, in order to protect them from potential risks and uphold their rights;

84. Calls on the Commission to propose measures for data traceability, having in mind both the legality of data acquisition and the protection of consumer rights and fundamental rights , while fully respecting Union law such as that concerning data protection, privacy, intellectual property rights and trade secrets;

85. Notes that these technologies should be user-centric and designed in a way that allows everyone to use AI products or services, regardless of their age, gender, abilities or characteristics; notes their accessibility for persons with disabilities is of particular importance; notes that there should not be a one-size-fits-all approach and universal design principles addressing the widest possible range of users and following relevant accessibility standards should be considered; stresses that this will enable individuals to have equitable access to and to actively participate in existing and emerging computer-mediated human activities and assistive technologies.

86. Stresses that where money originating from public sources significantly contributes to the development, deployment or use of artificial intelligence, robotics and related technologies, in addition to open procurement and open contracting standards, consideration could be given to the possibility of having the code, the generated data -as far as it is non-personal- and the trained model made public by default upon agreement with the developer, in order to guarantee transparency, enhance cybersecurity and enable the reuse thereof so as to foster innovation; stresses that, in this way, the full potential of the single market can be unlocked, avoiding market fragmentation;

87. Considers that AI, robotics and related technologies have enormous potential to deliver opportunities for consumers to have access to several amenities in many aspects of their lives alongside better products and services, as well as to benefit from better market surveillance, as long as all applicable principles, conditions, including transparency and auditability, and regulations continue to apply;

Security and defence

88. Highlights that the security and defence policies of the European Union and its Member States are guided by the principles enshrined in the European Charter of Fundamental Rights and those of the United Nations Charter, and by a common understanding of the universal values of respect for the inviolable and inalienable rights of the human person, human dignity, of freedom, of democracy, of equality and of the rule of law; stresses that all defence-related efforts within the Union framework must respect those universal values whilst promoting peace, security and progress in Europe and in the world;

89. Welcomes the endorsement, by the 2019 Meeting of High Contracting Parties to the United Nations Convention on Certain Conventional Weapons (CCW), of 11 Guiding Principles for the development and use of autonomous weapons systems; regrets however the failure to agree on a legally binding instrument regulating lethal autonomous weapons (LAWS), with an effective enforcement mechanism; welcomes

and supports the Commission's High-Level Expert Group on Artificial Intelligence 'Ethics Guidelines for Trustworthy AI' published on 9 April 2019 and its position on lethal autonomous weapon systems (LAWS); urges Member States to develop national strategies for the definition and status of lethal autonomous weapons (LAWS) towards a comprehensive strategy at Union level and to promote, together with the Union's High Representative/Vice-President of the Commission ('HR/VP') and the Council, the discussion on LAWS in the UN CCW framework and other relevant fora and the establishment of international norms regarding the ethical and legal parameters of the development and use of fully autonomous, semi-autonomous and remotely operated lethal weapons systems; recalls in this respect its resolution on autonomous weapon systems of 12 September 2018 and calls once again for the urgent development and adoption of a common position on lethal autonomous weapon systems, for an international ban on the development, production and use of lethal autonomous weapon systems enabling strikes to be carried out without meaningful human control and without respect for the human-in-the-loop principle, in line with the statement of the world's most prominent AI researchers in their open letter from 2015; welcomes the agreement of Council and Parliament to exclude lethal autonomous weapons 'without the possibility for meaningful human control over the selection and engagement decisions when carrying out strikes' from actions funded under the European Defence Fund; believes that ethical aspects of other AI-applications in defence, such as intelligence, surveillance and reconnaissance (ISR) or cyber operations must not be overlooked, and special attention must be paid to the development and deployment of drones in military operations;

90 Underlines that emerging technologies in the defence and security sector not covered by international law should be judged taking account of the principle of respect for humanity and the dictates of public conscience;

91. Recommends that any European framework regulating the use of artificial intelligence (AI)-enabled systems in defence, both in combat and non-combat situations, must respect all applicable legal regimes, in particular international humanitarian law and international human rights law, and it must be in compliance with Union law, principles and values, keeping in mind the disparities in terms of technical and security infrastructure throughout the Union;

92. Recognises that unlike defence industrial bases, critical AI innovations could come from small Member States, thus a CSDP-standardized approach should ensure that smaller Member States and SMEs are not crowded out; stresses that a set of common EU AI capabilities matched to Member States operating concepts can bridge the technical gaps that could leave out States lacking the relevant technology, industry expertise or the ability to implement AI systems in their defence ministries;

93. Considers that current and future security and defence-related activities within the Union framework will draw on AI, on robotics and autonomy, and on related technologies and that reliable, robust and trustworthy AI could contribute to a modern and effective military; the Union must therefore assume a leading role in research and development of AI systems in the security and defence field; believes that the use of AI-enabled applications in security and defence could offer a number of direct benefits to the operation commander, such as higher quality collected data, greater situational

awareness, increased speed for decision-making, reduced risk of collateral damage thanks to better cabling, protection of forces on the ground, as well as greater reliability of military equipment and hence reduced risk for humans and human casualties; stresses that the development of reliable AI in the field of defence is essential for ensuring European strategic autonomy in capability and operational areas; recalls that AI systems are also becoming key elements in countering emerging security threats, such as cyber and hybrid warfare both in the online and offline spheres; underlines at the same time all the risks and challenges of unregulated use of AI; notes that AI could be exposed to manipulation, to errors and inaccuracies;

94. Stresses that AI technologies are, in essence, dual use, and the development of AI in defence-related activities benefits from exchanges between military and civil technologies; highlights that AI in defence-related activities is a transverse disruptive technology, the development of which may provide opportunities for the competitiveness and the strategic autonomy of the Union;

95. Recognises, in the hybrid and advanced warfare context of today, that the volume and velocity of information during the early phases of a crisis might be overwhelming for human analysts and that an AI system could process the information to ensure that human decision-makers are tracking the full spectrum of information within an appropriate timeframe for a speedy response;

96. Underlines the importance of investing in the development of human capital for artificial intelligence, fostering the necessary skills and education in the field of security and defence AI technologies with particular focus on ethics of semi-autonomous and autonomous operational systems based on human accountability in an AI-enabled world; stresses in particular the importance of ensuring that ethicists in this field have appropriate skills and receive proper training ; calls on the Commission to present as soon as possible its "Reinforcement of the Skills Agenda", announced in the White Paper on Artificial Intelligence on the 19th February 2020;

97. Stresses that quantum computing could represent the most revolutionary change in conflict since the advent of atomic weaponry and thus urges that the further development of quantum computing technologies be a priority for the Union and Member States; recognises that acts of aggression, including attacks on critical infrastructure, aided by quantum computing will create a conflict environment in which the time available to make decisions will be compressed dramatically from days and hours to minutes and seconds, forcing Member States to develop capabilities that protect themselves and train both its decision makers and military personnel to respond effectively within such timeframes;

98. Calls for increased investment in European AI for defence and in the critical infrastructure that sustains it;

99. Recalls that most of the current military powers worldwide have already engaged in significant R&D efforts related to the military dimension of artificial intelligence; considers that the Union must ensure that it does not lag behind in this regard;

100. Calls on the Commission to embed cybersecurity capacity-building in its industrial policy in order to ensure the development and deployment of safe, resilient and robust

AI-enabled and robotic systems; calls on the Commission to explore the use of blockchain-based cybersecurity protocols and applications to improve the resilience, trustworthiness and robustness of AI infrastructures through disintermediated models of data encryption; encourages European stakeholders to research and engineer advanced features that would facilitate the detection of corrupt and malicious AI-enabled & robotics systems which could undermine the security of the Union and of citizens;

101. Stresses that all AI-systems in defence must have a concrete and well-defined mission framework, whereby humans retain the agency to detect and disengage or deactivate deployed systems should they move beyond the mission framework defined and assigned by a human commander, or should they engage in any escalatory or unintended action; considers that AI-enabled systems, products and technology intended for military use should be equipped with a 'black box' to record every data transaction carried out by the machine;

102. Underlines that the entire responsibility and accountability for the decision to design, develop, deploy and use AI-systems must rest on human operators, as there must be meaningful human monitoring and control over any weapon system and human intent in the decision to use force in the execution of any decision of AI-enabled weapons systems that might have lethal consequences; underlines that human control should remain effective for the command and control of AI-enabled systems, following the human-in-the loop, human-on-the loop and human-in-command principles at the military leadership level; stresses that AI-enabled systems must allow the military leadership of armies to assume its full responsibility and accountability for the use of lethal force and exercise the necessary level of judgment, which machines cannot be endowed with as such judgment must be based on distinction, proportionality and precaution, for taking lethal or large-scale destructive action by means of such systems; stresses the need to establish clear and traceable authorisation and accountability frameworks for the deployment of smart weapons and other AI-enabled systems, using unique user characteristics like biometric specifications to enable deployment exclusively by authorised personnel;

Transport

103. Highlights the potential of using artificial intelligence, robotics and related technologies for all autonomous means of road, rail, waterborne and air transport, and also for boosting the modal shift and intermodality, as such technologies can contribute to finding the optimal combination of modes of transport for the transport of goods and passengers; furthermore, stresses their potential to make transport, logistics and traffic flows more efficient and to make all modes of transport safer, smarter, and more environmentally friendly; points out that an ethical approach to AI can also be seen as an early warning system, in particular as regards the safety and efficiency of transport;

104 Highlights the fact that the global competition between companies and economic regions means that the Union needs to promote investments and strengthen the international competitiveness of companies operating in the transport sector, by establishing an environment favourable for the development and application of AI solutions and further innovations, in which Union-based undertakings can become world leaders in the development of AI technologies;

105. Stresses that the Union's transport sector needs an update of the regulatory framework concerning such emerging technologies and their use in the transport sector and a clear ethical framework for achieving trustworthy AI, including safety, security, the respect of human autonomy, oversight and liability aspects, which will increase benefits that are shared by all and will be key to boosting investment in research and innovation, development of skills and the uptake of AI by public services, SMEs, start-ups and businesses and at the same time ensuring data protection as well as interoperability, without imposing an unnecessary administrative burden on businesses and consumers;

106. Notes that the development and implementation of AI in the transport sector will not be possible without modern infrastructure, which is an essential part of intelligent transport systems; stresses that the persistent divergences in the level of development between Member States create the risk of depriving the least developed regions and their inhabitants of the benefits brought by the development of autonomous mobility; calls for the modernisation of transport infrastructure in the Union, including its integration into the 5G network, to be adequately funded;

107. Recommends the development of Union-wide trustworthy AI standards for all modes of transport, including the automotive industry, and for testing of AI-enabled vehicles and related products and services;

108. Notes that AI systems could help to reduce the number of road fatalities significantly, for instance through better reaction times and better compliance with rules; considers, however, that it will be impossible for use of autonomous vehicles to result in the elimination of all accidents and underlines that this makes the explainability of AI decisions increasingly important in order to justify shortcomings and unintended consequences of AI decisions;

Employment, workers' rights, digital skills and the workplace

109. Notes that the application of artificial intelligence, robotics and related technologies at the workplace can contribute to inclusive labour markets and impact occupational health and safety, while it can also be used to monitor, evaluate, predict and guide the performance of workers with direct and indirect consequences for their careers; whereas AI should have a positive impact on working conditions and be guided by respect for human rights as well as the fundamental rights and values of the Union; whereas AI should be human centric, enhance the well-being of people and society and contribute to a fair and just transition; such technologies should therefore have a positive impact on working conditions guided by respect for human rights as well as the fundamental rights and values of the Union;

110. Highlights the need for competence development through training and education for workers and their representatives with regard to AI in the workplace to better understand the implications of AI solutions; stresses that applicants and workers should be duly informed in writing when AI is used in the course of recruitment procedures and other human resource decisions and how in this case a human review can be requested in order to have an automated decision reversed;

111. Stresses the need to ensure that productivity gains due to the development and use of AI and robotics do not only benefit company owners and shareholders, but also profit

companies and the workforce, through better working and employment conditions, including wages, economic growth and development, and also serve society at large, especially where such gains come at the expense of jobs; calls on the Member States to carefully study the potential impact of AI on the labour market and social security systems and to develop strategies as to how to ensure long-term stability by reforming taxes and contributions as well as other measures in the event of smaller public revenues;

112. Underlines the importance of corporate investment in formal and informal training and life-long learning in order to support the just transition towards the digital economy; stresses in this context that companies deploying AI have the responsibility of providing adequate re-skilling and up-skilling for all employees concerned in order for them to learn how to use digital tools and to work with co-bots and other new technologies, thereby adapting to changing needs of the labour market and staying in employment;

113. Considers that special attention should be paid to new forms of work, such as gig and platform work, resulting from the application of new technologies in this context; stresses that regulating telework conditions across the Union and ensuring decent working and employment conditions in the digital economy must likewise take the impact of AI into account; calls on the Commission to consult with social partners, AI-developers, researchers and other stakeholders in this regard;

114. Underlines that artificial intelligence, robotics and related technologies must not in any way affect the exercise of fundamental rights as recognised in the Member States and at Union level, including the right or freedom to strike or to take other action covered by the specific industrial relations systems in Member States, in accordance with national law and/or practice, or affect the right to negotiate, to conclude and enforce collective agreements, or to take collective action in accordance with national law and/or practice;

115. Reiterates the importance of education and continuous learning to develop the qualifications necessary in the digital age and to tackle digital exclusion; calls on the Member States to invest in high quality, responsive and inclusive education, vocational training and life-long learning systems as well as re-skilling and up-skilling policies for workers in sectors that are potentially severely affected by AI; highlights the need to provide the current and future workforce with the necessary literacy, numeracy and digital skills as well as competences in science, technology, engineering and mathematics (STEM) and cross-cutting soft skills, such as critical thinking, creativity and entrepreneurship; underlines that special attention must be paid to the inclusion of disadvantaged groups in this regard;

116. Recalls that artificial intelligence, robotics and related technologies used at the workplace must be accessible for all, based on the design for all principle;

Education and culture

117. Stresses the need to develop criteria for the development, the deployment and the use of AI bearing in mind their impact on education, media, youth, research, sports and the cultural and creative sectors, by developing benchmarks for and defining principles of ethically responsible and accepted uses of AI technologies that can be appropriately applied in these areas, including a clear liability regime for products resulting from AI

use;

118. Notes that every child enjoys the right to public education of quality at all levels; therefore, calls for the development, the deployment and the use of quality AI systems that facilitate and provide quality educational tools for all at all levels and stresses that the deployment of new AI systems in schools should not lead to a wider digital gap being created in society; recognises the enormous potential contribution that AI and robotics can make to education; notes that AI personalised learning systems should not replace educational relationships involving teachers and that traditional forms of education should not be left behind, while at the same time pointing out that financial, technological and educational support, including specialised training in information and communications technology must be provided for teachers seeking to acquire appropriate skills so as to adapt to technological changes and not only harness the potential of AI but also understand its limitations; calls for a strategy to be developed at Union level in order to help transform and update our educational systems, prepare our educational institutions at all levels and equip teachers and pupils with the necessary skills and abilities;

119. Emphasises that educational institutions should aim to use AI systems for educational purposes that have received a European certificate of ethical compliance;

120. Emphasises that opportunities provided by digitisation and new technologies must not result in an overall loss of jobs in the cultural and creative sectors, the neglect of the conservation of originals or in the downplaying of traditional access to cultural heritage, which should equally be encouraged; notes that AI systems developed, deployed and used in the Union should reflect its cultural diversity and its multilingualism;

121. Acknowledges the growing potential of AI in the areas of information, media and online platforms, including as a tool to fight disinformation in accordance with Union law; underlines that, if not regulated, it might also have ethically adverse effects by exploiting bias in data and algorithms that may lead to disseminating disinformation and creating information bubbles; emphasises the importance of transparency and accountability of algorithms used by video-sharing platforms (VSP) as well as streaming platforms, in order to ensure access to culturally and linguistically diverse content;

National supervisory authorities

122. Notes the added value of having designated national supervisory authorities in each Member State, responsible for ensuring, assessing and monitoring compliance with legal obligations and ethical principles for the development, deployment and use of high-risk artificial intelligence, robotics and related technologies, thus contributing to the legal and ethical compliance of these technologies;

123. Believes that these authorities must be required to, without duplicating their tasks, cooperate with the authorities responsible for implementing sectorial legislation in order to identify technologies which are high-risk from an ethical perspective and in order to supervise the implementation of required and appropriate measures where such technologies are identified;

124. 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;

125. Suggests that, in the context of such cooperation, common criteria and an application process be developed for the granting of a European certificate of ethical compliance, including following a request by any developer, deployer or user of technologies not considered as high-risk seeking to certify the positive assessment of compliance carried out by the respective national supervisory authority;

126. Calls for such authorities to be tasked with promoting regular exchanges with civil society and innovation within the Union by providing assistance to researchers, developers, and other relevant stakeholders, as well as to less digitally-mature companies, in particular small and medium-sized enterprises or start-ups; in particular regarding awareness-raising and support for development, deployment, training and talent acquisition to ensure efficient technology transfer and access to technologies, projects, results and networks;

127. Calls for sufficient funding by each Member State of their designated national supervisory authorities and stresses the need for national market surveillance authorities to be reinforced in terms of capacity, skills and competences, as well as knowledge about the specific risks of artificial intelligence, robotics and related technologies;

Coordination at Union level

128. Underlines the importance of coordination at Union level as carried out by the Commission and/or any relevant institutions, bodies, offices and agencies of the Union that may be designated in this context in order to avoid fragmentation, and of ensuring a harmonised approach across the Union; considers that coordination should focus on the mandates and actions of the national supervisory authorities in each Member State as referred to in the previous sub-section, as well as on sharing of best practices among those authorities and contributing to the cooperation as regards research and development in the field throughout the Union; calls on the Commission to assess and find the most appropriate solution to structure such coordination; examples of relevant existing institutions, bodies, offices and agencies of the Union are ENISA, the EDPS and the European Ombudsman;

129. Believes that such coordination, as well as a European certification of ethical compliance, 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;

130. Suggests a centre of expertise be created, bringing together academia, research, industry, and individual experts at Union level, to foster exchange of knowledge and technical expertise, and to facilitate collaboration throughout the Union and beyond; further calls for this centre of expertise to involve stakeholder organisations, such as consumer protection organisations, in order to ensure wide consumer representation; considers that due to the possible disproportionate impact of algorithmic systems on women and minorities, the decision levels of such a structure should be diverse and ensure gender equality; emphasises that Member States must develop risk-management strategies

for AI in the context of their national market surveillance strategies;

131. Proposes that the Commission and/or any relevant institutions, bodies, offices and agencies of the Union that may be designated in this context provide any necessary assistance to national supervisory authorities concerning their role as first points of contact in cases of suspected breaches of the legal obligations and ethical principles set out in the Union's regulatory framework for AI, including the principle of non-discrimination; it should also provide any necessary assistance to national supervisory authorities in cases where the latter carry out compliance assessments in view of supporting the right of citizens to contest and redress, namely by supporting, when applicable, the consultation of other competent authorities in the Union, in particular the Consumer Protection Cooperation Network and national consumer protection bodies, civil society organisations and social partners located in other Member States;

132. Acknowledges the valuable output of the High-Level Expert Group on Artificial Intelligence, comprising representatives from academia, civil society and industry, as well as the European AI Alliance, particularly 'The Ethics Guidelines for Trustworthy Artificial Intelligence', and suggests that it might provide expertise to the Commission and/or any relevant institutions, bodies, offices and agencies of the Union that may be designated in this context;

133. Notes the inclusion of AI-related projects under the European Industrial Development Programme (EDIDP); believes that the future European Defence Fund (EDF) and the Permanent structured cooperation (PESCO) may also offer frameworks for future AI-related projects that could help to better streamline Union efforts in this field, and promote at the same time the Union's objective of strengthening human rights, international law, and multilateral solutions; stresses that AI-related projects should be synchronized with the wider Union civilian programmes devoted to AI; notes that in line with the European Commission's White Paper of 19 February 2020 on AI, excellence and testing centres concentrating on research and development of AI in the field of security and defence should be established with rigorous specifications underpinning the participation of and investment from private stakeholders;

134. Takes note of the Commission's White Paper of 19 February 2020 on Artificial Intelligence and regrets that military aspects were not taken into account; calls on the Commission and on the HR/VP to present, also as part of an overall approach, a sectoral AI strategy for defence-related activities within the Union framework, that ensures both respect for citizens' rights and the Union's strategic interests, and that is based on a consistent approach spanning from the inception of AI-enabled systems to their military uses, and to establish a working Group on security and defence within the High-Level Expert Group on Artificial Intelligence that should specifically deal with policy and investment questions as well as ethical aspects of AI in the field of security and defence; calls on the Council, the Commission and on the VP/HR to enter into a structured dialogue with Parliament to that end;

European certification of ethical compliance

135. Suggests that common criteria and an application process relating to the granting of a European certificate of ethical compliance be developed in the context of coordination

at Union level, including following a request by any developer, deployer or user of technologies not considered as high-risk seeking to certify the positive assessment of compliance carried out by the respective national supervisory authority;

136. Believes that such European certificate of ethical compliance would foster ethics by design throughout the supply chain of artificial intelligence ecosystems; suggests, therefore, that this certification could be, in the case of high-risk technologies, a mandatory prerequisite for eligibility for public procurement procedures on artificial intelligence, robotics and related technologies;

International cooperation

137. Is of the opinion that effective cross-border cooperation and ethical standards can be achieved only if all stakeholders commit to ensure human agency and oversight, technical robustness and safety, transparency and accountability, diversity, non-discrimination and fairness, societal and environmental well-being, and respect the established principles of privacy, data governance and data protection, specifically those enshrined in Regulation (EU) 2016/679 of the European Parliament and of the Council;

138. Stresses that the Union's legal obligations and ethical principles for the development, deployment and use of these technologies could make Europe a world leader in the artificial intelligence sector and should therefore be promoted worldwide by cooperating with international partners while continuing the critical and ethics-based dialogue with third countries that have alternative models of artificial intelligence regulation, development and deployment models;

139. Recalls that the opportunities and risks inherent to these technologies have a global dimension, as the software and data they use are frequently imported into and exported out of the Union, and therefore there is a need for a consistent cooperation approach at international level; calls on the Commission to take the initiative to assess which bilateral and multilateral treaties and agreements should be adjusted to ensure a consistent approach and promote the European model of ethical compliance globally;

140. Points out the added-value of coordination at Union level as referred to above in this context as well;

141. Calls for synergies and networks to be established between the various European research centres on AI as well as other multilateral fora, such as the Council of Europe, the United Nations Educational Scientific and Cultural Organization (UNESCO), the Organisation for Economic Co-operation and Development's (OECD),the World Trade Organisation and the International Telecommunications Union (ITU), in order to align their efforts and to better coordinate the development of artificial intelligence, robotics and related technologies;

142. Underlines that the Union must be at the forefront of supporting multilateral efforts to discuss in the framework of the UN CCW Governmental Expert Group and other relevant fora, to discuss an effective international regulatory framework that ensures meaningful human control over autonomous weapon systems in order to master those technologies by establishing well defined, benchmark-based processes and adopting legislation for their ethical use, in consultation with military, industry, law enforcement,

academia and civil society stakeholders, to understand the related ethical aspects and to mitigate the inherent risks of such technologies and prevent use for malicious purposes;

143. Recognises the role of NATO in promoting Euro-Atlantic security and calls for cooperation within NATO for the establishment of common standards and interoperability of AI systems in defence; stresses that the transatlantic relationship is important for the preservation of shared values and for countering future and emerging threats;

144. Stresses the importance of the creation of an ethical code of conduct underpinning the deployment of weaponised AI-enabled systems in military operations, similar to the existing regulatory framework prohibiting the deployment of chemical and biological weapons; is of the opinion that the Commission should initiate the creation of standards on the use of AI-enabled weapons systems in warfare in accordance with international humanitarian law, and that the Union should pursue the international adoption of such standards; considers that the Union should engage in AI diplomacy in international fora with like-minded partners like the G7, the G20, and the OECD;

Final aspects

145. Concludes, following the above reflections on aspects related to the ethical dimension of artificial intelligence, robotics and related technologies, that the legal and ethical dimensions should be enshrined in an effective, forward looking and comprehensive regulatory framework at Union level, supported by national competent authorities, coordinated and enhanced by the Commission and/or any relevant institutions, bodies, offices and agencies of the Union that may be designated in this context regularly supported by the possible aforementioned centre of expertise and duly respected and certified within the internal market;

146. In accordance with the procedure laid down in 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 based on the detailed recommendations set out in the annex hereto; points out that the proposal should not undermine sector-specific legislation but should only cover identified loopholes;

147. Recommends that the European Commission, after consulting with all the relevant stakeholders, review, if necessary, 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, avoiding over-regulation, including for SMEs;

148. Believes that a periodical assessment and review, when necessary, of the Union regulatory framework related to artificial intelligence, robotics and related technologies will be essential to ensure that the applicable legislation is up to date with the rapid pace of technological progress;

149. Considers that the legislative proposal requested would have financial implications if any European body entrusted with the above-mentioned coordination functions to

ensure the necessary technical means and human resources to fulfil its newly attributed tasks were provided;

150. 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 at all levels of involved stakeholders and of society in artificial intelligence, robotics and related technologies, especially when they are considered high-risk;

- to support the development of artificial intelligence, robotics and related technologies in the Union, including by helping businesses, start-ups and small and medium-sized enterprises to assess and address with certainty current and future regulatory requirements and risks during the innovation and business development process, and during the subsequent phase of use by professionals and private individuals, by minimising burdens and red tape;

- to support deployment of artificial intelligence, robotics and related technologies in the Union by providing the appropriate and proportionate regulatory framework which should apply without prejudice to existing or future sectorial legislation, with the aim of encouraging regulatory certainty and innovation while guaranteeing fundamental rights and consumer protection;

- to support use of artificial intelligence, robotics and related technologies in the Union by ensuring that they are developed, deployed and used in a manner that is compliant with ethical principles;

- to require transparency and 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 Union law, fundamental rights and values, and with the ethical principles of the proposal for Regulation requested.

II. The proposal consists of the following elements:

- a “Regulation on ethical principles for the development, deployment and use of artificial intelligence, robotics and related technologies”;the coordination role at Union level by the Commission and/or any relevant institutions, bodies, offices and agencies of the Union that may be designated in this context and a European certification of ethical compliance;

- the support role of the European Commission;

- the role of 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, relevant research and development projects and concerned stakeholders, including start-ups, small and medium-sized enterprises, businesses, social partners, and other representatives of the civic society;

- an annex establishing an exhaustive and cumulative list of high-risk sectors and high-risk uses and purposes;

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, human-made and human-controlled artificial intelligence, robotics and related technologies;

- mandatory compliance assessment of high-risk artificial intelligence, robotics and related technologies;

- safety, transparency and accountability;

- safeguards and remedies against bias and discrimination;

- right to redress;

- social responsibility and gender equality in artificial intelligence, robotics and related technologies;

- environmentally sustainable artificial intelligence, robotics and related technologies;

- respect for privacy and limitations to the use of biometric recognition;

- good governance relating to artificial intelligence, robotics and related technologies, including the data used or produced by such technologies.

IV. For the purposes of coordination at Union level, the Commission and/or any relevant institutions, bodies, offices and agencies of the Union that may be designated in this context should carry out the following main tasks:

- cooperating in monitoring the implementation of the proposal for a Regulation requested and relevant sectoral Union law;

- cooperating regarding the issuing of guidance concerning the consistent application of the proposal for a Regulation requested, namely the application of the criteria for artificial intelligence, robotics and related technologies to be considered high-risk and the list of high-risk sectors and high-risk uses and purposes set out in the annex to the Regulation;

- cooperating with the "Supervisory Authority" in each Member State regarding the developing of a European certificate of compliance with ethical principles and legal obligations as laid down in the proposal for a Regulation requested and relevant Union law, as well as the developing of an application process for any

developer, deployer or user of technologies not considered as high-risk seeking to certify their compliance with the proposal for a Regulation requested;

- cooperating regarding the supporting of cross-sector and cross-border cooperation through regular exchanges with concerned stakeholders and the civil society, in the EU and in the world, notably with businesses, social partners, researchers and competent authorities, including as regards the development of technical standards at international level;

- cooperating with the "Supervisory Authority" in each Member State regarding the establishing of binding guidelines on the methodology to be followed for the compliance assessment to be carried out by each "Supervisory Authority";

- cooperating regarding the liaising with the "Supervisory Authority" in each Member State and the coordinating of their mandate and tasks;

- cooperating on raising awareness, providing information and engaging in exchanges with developers, deployers and users throughout the Union;

- cooperating on raising awareness, providing information, promoting digital literacy, training and skills and engaging in exchanges with designers, developers, deployers, citizens, users and institutional bodies throughout the Union and internationally;

- cooperating regarding the coordination of a common framework for the governance of the development, deployment and use of artificial intelligence, robotics and related technologies to be implemented by the "Supervisory Authority" in each Member State;

- cooperating regarding serving as a centre for expertise by promoting the exchange of information and supporting the development of a common understanding in the Single Market;

- cooperating regarding the hosting of a Working Group on Security and Defence.

V. Additionally, the Commission should carry out the following tasks:

- drawing up and subsequently updating, by means of delegated acts, a common list of high-risk technologies identified within the Union in cooperation with the "Supervisory Authority" in each Member State;

- updating, by means of delegated acts, the list provided for in the Annex to the Regulation.

VI. The "Supervisory Authority" in each Member State should carry out the following main tasks:

- contributing to the consistent application of the regulatory framework established in the proposal for a Regulation requested in cooperation with the "Supervisory Authority" in the other Member States, as well as other authorities responsible for implementing sectorial legislation, the Commission and and/or any relevant

institutions, bodies, offices and agencies of the Union that may be designated in this context, namely regarding the application of the risk assessment criteria provided for in the proposal for a Regulation requested and of the list of high-risk sectors and of high-risk uses or purposes set out in its annex, and the following supervision of the implementation of required and appropriate measures where high-risk technologies are identified as a result of such application;

- 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 to be considered high-risk technologies in accordance with the risk assessment criteria provided for in the proposal for a Regulation requested and in the list set out in its annex;

- issuing a European certificate of compliance with ethical principles and legal obligations as laid down in the proposal for Regulation requested and relevant Union law, including when resulting from an application process for any developer, deployer or user of technologies not considered as high-risk seeking to certify their compliance with the proposal for a Regulation requested, as developed by the Commission and/or any relevant institutions, bodies, offices and agencies of the Union that may be designated in this context;

- assessing and monitoring their compliance with ethical principles and legal obligations as laid down in the proposal for a Regulation requested and relevant Union law;

- being responsible for establishing and implementing standards for the governance of artificial intelligence, robotics and related technologies, including by liaising and sustaining a regular dialogue with all relevant stakeholders and civil society representatives; to that end, cooperating with the Commission and any relevant institutions, bodies, offices and agencies of the Union that may be designated in this context regarding the coordination of a common framework at Union level;

- raising awareness, providing information on artificial intelligence, robotics and related technologies to the public, and supporting the training of relevant professions, including in the judiciary, thereby empowering citizens and workers with the digital literacy, skills and tools necessary for a fair transition;

- serving as a first point of contact in cases of suspected breach of the legal obligations and ethical principles set out in the proposal for a Regulation requested and carrying out a compliance assessment in such cases; in the context of this compliance assessment, it may consult and/or inform other competent authorities in the Union, notably the Consumer Protection Cooperation Network, national consumer protection bodies, civil society organisations and social partners.

VII. The key role of stakeholders should be to engage with the Commission and/or any relevant institutions, bodies, offices and agencies of the Union that may designated in this context 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, should be based on a desire to serve society. Such technologies can entail opportunities and risks, which should be addressed and regulated by a comprehensive regulatory framework at Union level, reflecting ethical principles, to be complied with from the moment of the development and deployment of such technologies to their use.

(2) Compliance with such a regulatory framework 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 of a level that is equivalent in all Member States, in order to efficiently seize the opportunities and consistently address the risks of such technologies, as well as avoid regulatory fragmentation. 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 of fragmentation of the Single Market and 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 for promoting innovation and preserving that well-being and prosperity. Differences in the degree of consideration on the part of developers,

deployers and users 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 a level playing field and to the pursuit of technological progress and 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 regulatory framework, reflecting 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, while contributing to a coherent approach at Union level and within the limits set by it, this Regulation should provide a margin for implementation by Member States, including with regard to how the mandate of their respective national supervisory authority is to be carried out, in view of the objective it is to achieve as set out herein.

(5) This Regulation is without prejudice to existing or future sectorial legislation. It should be proportionate with regard to its objective so as not to unduly hamper innovation in the Union and be in accordance with a risk-based approach.

(6) The geographical scope of application of such a framework should cover all the components of artificial intelligence, robotics and related technologies throughout their development, deployment and use in the Union, including in cases where part of the technologies might be located outside the Union or not have a specific or single location, such as in the case of cloud computing services.

(7) A common understanding in the Union of notions such as artificial intelligence, robotics, related technologies and biometric recognition is required in order to allow for a unified regulatory approach and thus legal certainty for citizens and companies alike. They should be technologically neutral and subject to review whenever necessary.

(8) In addition, the fact that there are technologies related to artificial intelligence and robotics that enable software to control physical or virtual processes, at a varying degree of autonomy[1], needs to be considered. For example, for automated driving of vehicles, six levels of driving automation have been propose by SAE international standard J3016.

(9) 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 complement human capabilities, not substitute them and ensure that their execution does not run against the best interests of citizens and that it complies with Union law, fundamental rights as set out in the Charter of Fundamental

[1] For automated driving of vehicles, six levels of driving automation have been proposed by SAE International standard J3016, last updated in 2018 to J3016_201806. https://www.sae.org/standards/content/j3016_201806/

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.

(10) Decisions made or informed by artificial intelligence, robotics and related technologies should 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, trigger a fail-safe shutdown, alter or halt their operation, or revert to a previous state restoring safe functionalities in cases where the compliance with Union law and the ethical principles and legal obligations laid down in this Regulation is at risk.

(11) Artificial intelligence, robotics and related technologies whose development, deployment and use entail a significant risk of causing injury or harm to individuals or society in breach of fundamental rights and safety rules as laid down in Union law, should be considered as high-risk technologies. For the purposes of assessing them as such, the sector where they are developed, deployed or used, their specific use or purpose and the severity of the injury or harm that can be expected to occur should be considered. The degree of severity should be determined based on the extent of the potential injury or harm, the number of affected persons, the total value of damage caused and the harm to society as a whole. Severe types of injury and harm are, for instance, violations of children's, consumers' or workers' rights that, due to their extent, the number of children, consumers or workers affected or their impact on society as a whole entail a significant risk to breach fundamental rights and safety rules as laid down in Union law. This Regulation should provide an exhaustive and cumulative list of high-risk sectors, and high-risk uses and purposes.

(12) The obligations laid down in this Regulation, specifically those regarding high-risk technologies, should only apply 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, which, following the risk assessment provided for in this Regulation, are considered as high-risk. Such obligations are to be complied with without prejudice to the general obligation that any artificial intelligence, robotics and related technologies, including software, algorithms and data used or produced by such technologies, should be developed, deployed and used in the Union in a human-centric manner and based on the principles of human autonomy and human safety in accordance with Union law and in full respect of fundamental rights such as human dignity, right to liberty and security and right to the integrity of the person.

(13) High-risk technologies should respect the principles of safety, transparency, accountability, non-bias or non-discrimination, social responsibility and gender equality, right to redress, environmental sustainability, privacy and good governance,

following an impartial, objective and external risk assessment by the national supervisory authority in accordance with the criteria provided for in this Regulation and in the list set out in its annex. This assessment should take into account the views and any self-assessment made by the developer or deployer.

(14) The Commission and/or any relevant institutions, bodies, offices and agencies of the Union that may be designated for this purpose should prepare non-binding implementation guidelines for developers, deployers and users on the methodology for compliance with this Regulation. In doing so, they should consult relevant stakeholders.

(15) There should be coherence within the Union when it comes to the risk assessment of these technologies, especially in the event they are assessed both in light of this Regulation and in accordance with any applicable sector-specific legislation. Accordingly, national supervisory authorities should inform other authorities carrying out risk assessments in accordance with any sector-specific legislation when these technologies are assessed as high-risk following the risk assessment provided for in this Regulation.

(16) To be trustworthy high-risk 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 in accordance with the safety features of robustness, resilience, security, accuracy and error identification, explainability, interpretability, auditability, transparency and identifiability, and in a manner that makes it possible to disable the functionalities concerned or to revert to a previous state restoring safe functionalities, in cases of non-compliance with those features. Transparency should be ensured by allowing access to public authorities, when strictly necessary, to technology, data and computing systems underlying such technologies.

(17) Developers, deployers and users of artificial intelligence, robotics and related technologies, especially high-risk technologies, are responsible to varying degrees for the compliance with safety, transparency and accountability principles to the extent of their involvement with the 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 the safety features set out in this Regulation, whereas deployers and users should deploy and use the concerned technologies in full observance of those features. To this end, developers of high-risk technologies should evaluate and anticipate the risks of misuse that can reasonably be expected regarding of the technologies they develop. They must also ensure that the systems they develop indicate to the extent possible and through appropriate means, such as disclaimer messages, the likelihood of errors or inaccuracies.

(18) Developers and deployers should make available to users any subsequent updates of the technologies concerned, namely in terms of software as stipulated by contract or

laid down in Union or national law. In addition where a risk assessment so indicates, developers and deployers should provide public authorities, with for the relevant documentation on the use of the technologies concerned and safety instructions in that regard, including, when strictly necessary and in full respect of Union law on data protection, privacy and intellectual property rights and trade secrets, the source code, development tools and data used by the system.

(19) Individuals have a right to expect the technology they use to perform in a reasonable manner and to respect their trust. The trust placed by citizens 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 of those technical processes, and on the severity of the consequences of an erroneous or inaccurate output, and needs to be sufficient for challenging them and for seeking redress. Auditability, traceability, and transparency should address any possible unintelligibility of such technologies.

(20) 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. Within the limits of what is technically possible, developers, 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.

(21) In order to ensure transparency and accountability, citizens should be informed when a system uses artificial intelligence, when artificial intelligence systems personalise a product or service for its users, whether they can switch off or limit the personalisation and when they are faced with an automated-decision making technology. Furthermore, transparency measures should be accompanied, as far as this is technically possible, by clear and understandable explanations of the data used and of the algorithm, its purpose, its outcomes and its potential dangers.

(22) 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 deployed. Bias can originate both from decisions informed or made by an automated system as well as from data sets on which such decision making is based or with which the system is trained.

(23) 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 or social perception and subsequent processing of data relating to

their traits.

(24) 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 produce outcomes that have disproportionate negative effects and result in different treatment of a person or group of persons, including by putting them at a disadvantage when compared to others, based on grounds such as their personal traits, without objective or reasonable justification and regardless of any claims of neutrality of the technologies.

(25) In line with Union law, legitimate aims that could under this Regulation be considered to 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 fundamental rights and freedoms, fair representation and objective requirements for holding a professional occupation.

(26) Artificial intelligence, robotics and related technologies, including software, algorithms and data used or produced by such technologies, should contribute to sustainable progress. Such technologies should not run counter to the cause of preservation of the environment or the green transition. They could play an important role in achieving 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.

(27) 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 purposefully cause or accept by design injury or harm of any kind to individuals or society. Accordingly, high-risk technologies in particular should be developed, deployed and used in a socially responsible manner.

(28) Therefore, developers, deployers and users should be held responsible, to the extent of their involvement in the artificial intelligence, robotics and related technologies concerned, and in accordance with Union and national liability rules, for any injury or harm inflicted upon individuals and society.

(29) 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 by taking decisions regarding such deployment and by exercising control over the associated risks or benefiting from such deployment, with a controlling 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.

(30) 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 contribute to find solutions that safeguard and promote different aims regarding 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 and that do not promote hate speech or violence. Such aims should be achieved in particular by means of high-risk technologies.

(31) Artificial intelligence, robotics and related technologies should also be developed, deployed and used with a view to supporting social inclusion, democracy, 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 communication, administrative and financial resources for the purpose of supporting and investing in such projects.

(32) 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.

(33) 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. In line with obligations laid down in applicable Union law, such technologies should not cause harm to the environment during their lifecycle and across their entire supply chain and should be developed, deployed and used in a manner that preserves the environment, mitigates and remedies their environmental footprint, contributes to the green transition and supports the achievement of climate neutrality and circular economy goals.

(34) For the purposes of this Regulation, developers, deployers and users should be held responsible, to the extent of their respective involvement in the development, deployment or use of any artificial intelligence, robotics and related technologies considered as high-risk, for any harm caused to the environment in accordance with the applicable environmental liability rules.

(35) These technologies should also be developed, deployed and used with a view to supporting the achievement of environmental goals in line with the obligations laid down in applicable Union law, such as reducing waste production, diminishing the

carbon footprint, combating climate change and preserving the environment, 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 communication, administrative and financial resources for the purpose of supporting and investing in such projects.

(36) 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.

(37) 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 Council[2] and Directive 2002/58/EC of the European Parliament and of the Council[3].

(38) In particular, 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 recognition of biometric features, notably facial recognition, to automatically identify individuals. When these technologies are used by public authorities for reasons of substantial public interest, namely to guarantee the security of individuals and to address national emergencies, and not to guarantee the security of properties, the use should always be disclosed, proportionate, targeted and limited to specific objectives and restricted in time in accordance with Union law and having due regard to human dignity and autonomy and the fundamental rights set out in the Charter. Criteria for and limits to that use should be subject to judicial review and submitted to democratic scrutiny and debate involving civil society.

(39) Governance that is based on relevant standards enhances safety and promotes the 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.

(40) Public authorities should conduct impact assessments regarding fundamental rights before deploying high-risk technologies which provide support for decisions that are taken in the public sector and that have a direct and significant impact on citizen's

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[2] 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).

[3] 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).

rights and obligations.

(41) 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 any other technical standards such as those 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.

(42) 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 rules, standards and protocols reflecting the requirements of quality, integrity, security, reliability, privacy and control. The data governance strategy should focus on the processing, sharing of and access to such data, including its proper management, auditability and traceability, and guarantee the adequate protection of data belonging to vulnerable groups, including people with disabilities, patients, children, minorities and migrants or other groups at risk of exclusion. In addition, developers, deployers and users should be able, where relevant, to rely on key performance indicators in the assessment of the datasets they use for the purposes of enhancing the trustworthiness of the technologies they develop, deploy and use.

(43) Member States should appoint an independent administrative authority to act as a supervisory authority. In particular, each national supervisory authority should be responsible for identifying artificial intelligence, robotics and related technologies considered as high-risk in the light of the risk assessment criteria provided for in this Regulation and for assessing and monitoring the compliance of these technologies with the obligations laid down in this Regulation.

(44) Each national supervisory authority should also carry the responsibility of the good governance of these technologies under the coordination of the Commission and/or any relevant institutions, bodies, offices or agencies of the Union that may be designated for this purpose. 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.

(45) For the purposes of assessing technologies which are high-risk in accordance with this Regulation and monitoring their compliance with it, national supervisory authorities should, where applicable, cooperate with the authorities responsible for assessing and monitoring these technologies and enforcing their compliance with sectorial legislation.

(46) 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 and legal obligations laid down in this Regulation.

(47) In the context of such cooperation and in view of achieving full harmonisation at Union level, national supervisory authorities should assist the Commission regarding drawing up a common and exhaustive list of high-risk artificial intelligence, robotics and related technologies in line with the criteria provided for in this Regulation and its Annex. Furthermore a granting process should be developed for the issuing of a European certificate of ethical compliance, including a voluntary application process for any developer, deployer or user of technologies not considered as high-risk seeking to certify their compliance with this Regulation.

(48) 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.

(49) 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, to facilitate cooperation with and collaboration between stakeholders, in particular from academia, research, industry, civil society and individual experts, so as to achieve comprehensible and accurate conclusions for the purpose of guiding how governance is regulated.

(50) 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 ethical principles and legal obligations laid down in this Regulation.

(51) The Commission and/or any relevant institutions, bodies, offices and agencies of the Union that may be designated for this purpose should establish binding guidelines on the methodology to be used by the national supervisory authorities when conducting their compliance assessment.

(52) 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.

(53) 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.

(54) Since the objective of this Regulation, namely to establish a common regulatory framework of ethical principles and legal obligations 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.

(55) Coordination at Union level as set out in this Regulation would be best achieved by the Commission and/or any relevant institutions, bodies, offices and agencies of the Union that may be designated in this context in order to avoid fragmentation and ensure the consistent application of this Regulation. The Commission should therefore be tasked with finding an appropriate solution to structure such coordination at Union level in view of coordinating the mandates and actions of the national supervisory authorities in each Member State, namely regarding the risk assessment of artificial intelligence, robotics and related technologies, the establishment of a common framework for the governance of the development, deployment and use of these technologies, the developing and issuing of a certification of compliance with the ethical principles and legal obligations laid down in this Regulation, supporting regular exchanges with concerned stakeholders and civil society and creating a centre of expertise, bringing together academia, research, industry, and individual experts at Union level to foster exchange of knowledge and technical expertise, and 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:

Chapter I
General provisions

Article 1
Purpose

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

Article 2
Scope

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 a system that is either software-based or embedded in hardware devices, and that displays intelligent behaviour by, inter alia, collecting, processing, analysing, and interpreting its environment, and by taking action, with some degree of autonomy, to achieve specific goals[4];

(b) ‘autonomy’ means an AI-system that operates by interpreting certain input and using a set of pre-determined instructions, without being limited to such instructions, despite the system’s behaviour being constrained by and targeted at fulfilling the goal it was given and other relevant design choices made by its developer;

[4] Definition as in the European Commission Communication COM(2018) 237 final, 25.04.2018, page 1, adapted.

(c) ‘robotics’ means technologies that enable automatically controlled, reprogrammable, multi-purpose machines[5] to perform actions in the physical world traditionally performed or initiated by human beings, including by way of artificial intelligence or related technologies;

(d) ‘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 biometric, genetic or other data, and technologies that copy or otherwise make use of human traits;

(e) ‘high risk’ means a significant risk entailed by the development, deployment and use of artificial intelligence, robotics and related technologies to cause injury or harm to individuals or society in breach of fundamental rights and safety rules as laid down in Union law, considering their specific use or purpose, the sector where they are developed, deployed or used and the severity of injury or harm that can be expected to occur;

(f) ‘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;

(g) ‘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;

(h) ‘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;

(i) ‘deployer’ means any natural or legal person who is involved in the specific deployment of artificial intelligence, robotics and related technologies with a controlling or managing function by taking decisions, exercising control over the risk and benefiting from such deployment;

(j) ‘use’ means any action relating to artificial intelligence, robotics and related technologies other than development or deployment;

(k) ‘user’ means any natural or legal person who uses artificial intelligence, robotics and related technologies other than for the purposes of development or deployment;

[5] From the definition for industrial robots in ISO 8373.

(l) ‘bias’ means any prejudiced personal or social perception of a person or group of persons on the basis of their personal traits;

(m) ‘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;

(n) ‘injury or harm’ means, including where caused by hate speech, bias, discrimination or stigmatization, physical or mental injury, material or immaterial harm such as financial or economic loss, loss of employment or educational opportunity, undue restriction of freedom of choice or expression or loss of privacy, and any infringement of Union law that is detrimental to a person;

(o) ‘good governance’ means the manner of ensuring that the appropriate and reasonable standards and 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 Union law and in full respect of human dignity, autonomy and safety and other fundamental rights set out in the Charter.

2. Any processing of personal data carried out in the development, deployment and use of artificial intelligence, robotics and related technologies, 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.

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, democracy**,** plurality, solidarity, fairness, equality and cooperation.

Chapter II

Obligations for high-risk technologies

Article 6

Obligations for high-risk technologies

1. The provisions in this Chapter shall only apply 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 which are considered high-risk.

2. Any high-risk 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 manner that ensures that they do not breach the ethical principles set out in this Regulation.

Article 7

Human-centric and human-made artificial intelligence

1. Any artificial high-risk technologies, including software, algorithms and data used or produced by such technologies, shall be developed, deployed and used in a manner that guarantees full human oversight at any time.

2. The technologies referred to paragraph 1 shall be developed, deployed and used in a manner that allows full human control to be regained when needed, including through the altering or halting of those technologies.

Article 8

Safety, transparency and accountability

1. Any high-risk 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 manner that ensures that they are:

(a) developed, deployed and used in a resilient manner so that they ensure an adequate level of security by adhering to minimum cybersecurity baselines proportionate to identified risk, and one that prevents any technical vulnerabilities from being exploited for malicious or unlawful purposes;

(b) 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 safety or security risk;

(c) developed, deployed and used in a manner that ensures a reliable performance as reasonably expected by the user regarding reaching the aims and carrying out the activities they have been conceived for, including by ensuring that all operations are reproducible;

(d) 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, to the extent possible, the likeliness of errors and inaccuracies to deployers and users through appropriate means;

(e) 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;

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

(g) in accordance with Article 6, 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 functionalities concerned to be temporarily disabled and to revert to a previous state restoring safe functionalities.

2. In accordance with Article 6(1), the technologies mentioned in paragraph 1, including software, algorithms and data used or produced by such technologies, shall be developed, deployed and used in transparent and traceable manner so that their elements, processes and phases are documented to the highest possible and applicable 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 or, where applicable, other national or European sectorial supervisory bodies.

Article 9

Non-bias and non-discrimination

1. Any software, algorithm or data used or produced by high-risk 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, ethnicity or social origin, language, religion or belief, political views or civic participation, citizenship, civil or economic status, education, or criminal record.

2. 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 equality

Any high-risk artificial intelligence, robotics and related technologies, including software, algorithms and data used or produced by such technologies, developed, deployed and used in the Union shall be developed, deployed and used in compliance with relevant Union law, principles and values, in a manner that does not interfere in elections or contribute to the dissemination of disinformation, respects worker's rights, promotes quality education and digital literacy, does not increase the gender gap by preventing equal opportunities for all and does not disrespect intellectual property rights and any limitations or exceptions thereto.

Article 11

Environmental sustainability

Any high-risk artificial intelligence, robotics and related technologies, including software, algorithms and data used or produced by such technologies, shall be assessed as to their environmental sustainability by the national supervisory authorities referred to in Article 14 or, where applicable, other national or European sectorial supervisory bodies, ensuring that measures are put in place to mitigate and remedy their general impact as regards natural resources, energy consumption, waste production, the carbon footprint, climate change emergency and environmental degradation in order to ensure compliance with the applicable Union or national law, as well as any other international environmental commitments the Union has undertaken.

Article 12

Respect for privacy and protection of personal data

The use and gathering of biometric data for remote identification purposes in public areas, as biometric or facial recognition, carries specific risks for fundamental rights and shall be deployed or used only by Member States' public authorities for substantial public interest purposes. Those authorities shall ensure that such deployment or use is disclosed to the public, proportionate, targeted and limited to specific objectives and location and restricted in time, in accordance with Union and national law, in particular Regulation (EU) 2016/679 and Directive 2002/58/EC, and with due regard for human dignity and autonomy and the fundamental rights set out in the Charter, namely the rights to respect for privacy and protection of personal data.

Article 13

Right to redress

Any natural or legal person shall have the right to seek redress for injury or harm caused by the development, deployment and use of high-risk artificial intelligence, robotics and related technologies, including software, algorithms and data used or produced by such technologies, in breach of Union law and the obligations set out in this Regulation

Article 14

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, shall be considered high-risk technologies when, following a risk assessment based on objective criteria such as their specific use or purpose, the sector where they are developed, deployed or used and the severity of the possible injury or harm caused, their development, deployment or use entail a significant risk to cause injury or harm that can be expected to occur to individuals or society in breach of fundamental rights and safety rules as laid down in Union law.

2. Without prejudice to applicable sectorial legislation, 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, in accordance with the objective criteria provided for in paragraph 1 of this Article and in the exhaustive and cumulative list set out in the Annex to this Regulation, by the national supervisory authorities referred to in Article 14 under the coordination of the Commission and/or any other relevant institutions, bodies, offices and agencies of the Union that may be designated for this purpose in the context of their cooperation.

3. In cooperation with the national supervisory authorities referred to in paragraph 2, the Commission shall, by means of delegated acts in accordance with Article 15a, draw up and subsequently update a common list of high-risk technologies identified within the Union.

4. The Commission shall also, by means of delegated acts in accordance with Article 15a, regularly update the list provided for in the Annex to this Regulation.

Article 15

Compliance assessment

1. High-risk artificial intelligence, robotics and related technologies shall be subject to an assessment of compliance with the obligations set out in Articles 6 to 12 of this Regulation, as well as to subsequent monitoring, both of which shall be carried out by the national supervisory authorities referred to in Article 17 under the coordination of the Commission and/or any other relevant institutions, bodies, offices and agencies of the Union that may be designated for this purpose.

2. The software, algorithms and data used or produced by high-risk technologies which have been assessed as compliant with the obligations set out in this Regulation pursuant to paragraph 1 shall also be considered to comply with those obligations, unless the relevant national supervisory authority decides to conduct an assessment on its own initiative or at the request of the developer, the deployer or the user.

3. Without prejudice to sectorial legislation, the Commission and/or any relevant institutions, bodies, offices and agencies of the Union that may be specifically designated for this purpose shall prepare binding guidelines on the methodology to be used by the national supervisory authorities for the compliance assessment referred to in paragraph 1 by the date of the entry into force of this Regulation.

Article 16

European certificate of ethical compliance

1. Where there has been a positive assessment of compliance of high-risk artificial intelligence, robotics and related technologies, including software, algorithms and data used or produced by such technologies, carried out in line with Article 7bis, the respective national supervisory authority shall issue a European certificate of ethical compliance.

2. Any developer, deployer or user of artificial intelligence, robotics and related technologies, including software, algorithms and data used or produced by such technologies, that are not considered as high-risk and that are therefore not subject to the obligations laid down in Articles 6 to 12 and to the risk assessment and compliance assessment provided for in Articles 13 and 14, may also seek to certify the compliance with the obligations laid down in this Regulation, or part of them where so justified by the nature of the technology in question as decided by the national supervisory authorities. A certificate shall only be issued if an assessment of compliance has been carried out by the relevant national supervisory authority and that assessment is positive.

3. For the purposes of issuing the certificate referred to in paragraph 2, an application process shall be developed by the Commission and/or any other relevant institutions, bodies, offices and agencies of the Union that may be designated for this purpose.

Chapter III

Institutional oversight

Article 17

Governance standards and implementation guidance

1. Artificial intelligence, robotics and related technologies developed, deployed or used in the Union shall comply with relevant governance standards established in accordance with Union law, principles and values by the national supervisory authorities referred to in Article 17 in accordance with Union law, principles and values, under the coordination of the Commission and/or relevant institutions, bodies, offices and agencies of the Union that may be designated for this purpose and in consultation with relevant stakeholders.

2. The standards referred to in paragraph 1 shall include non-binding implementation guidelines on the methodology for compliance with this Regulation by developers, deployers and users and shall be published by the date of entry into force of this Regulation.

3. 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 national, Union, other European organisations' and international rules and standards, 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 national, Union, other European organisations' and international rules and standards, 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 18

Supervisory authorities

1. Each Member State shall designate an independent public authority to be responsible for monitoring the application of this Regulation ('supervisory authority'), and for carrying out the risk and compliance assessments and the certification provided for in Articles 13, 14 and 15, without prejudice to sectorial legislation.

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/or other relevant institutions, bodies, offices and agencies of the Union, that may be designated for this purpose.

3. Each national supervisory authority shall serve as a first point of contact in cases of suspected breach of the ethical principles and legal obligations laid down in this Regulation, including discriminatory treatment or violation of other rights, as a result of the development,

deployment or use of artificial intelligence, robotics and related technologies. In such cases, the respective national supervisory authority shall carry out a compliance assessment in view of supporting the right of citizens to contest and redress.

4. Each national supervisory authority shall be responsible for supervising the application of the relevant national, European and international governance rules and standards referred to in Article 13 to artificial intelligence, robotics and related technologies, including by liaising with the maximum possible number of relevant stakeholders. For that purpose, the supervisory authorities in each Member State shall provide a forum for regular exchange with and among stakeholders from academia, research, industry and civil society.

5. Each national supervisory authority shall provide professional and administrative guidance and support concerning the general implementation of Union law applicable to artificial intelligence, robotics and related technologies and the ethical principles set out in this Regulation, especially to relevant research and development organisations and small and medium-sized enterprises or start-ups.

6. 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.

7. Member States shall take all measures necessary to ensure the implementation of the ethical principles and legal obligations laid down 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 19

Reporting of breaches and protection of reporting persons

Directive (EU) 2019/1937 of the European Parliament and of the Council[6] shall apply to the reporting of breaches of this Regulation and the protection of persons reporting such breaches.

Article 20

Coordination at Union level

1. The Commission and/or any relevant institutions, bodies, offices and agencies of the Union that may be designated in this context shall have the following tasks:

[6] 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).

- ensuring a consistent risk assessment of artificial intelligence, robotics and related technologies referred to in Article 13 to be carried out by the national supervisory authorities referred to in Article 17 on the basis of the common objective criteria provided for in Article 7(1) and in the list of high-risk sectors and of high-risk uses or purposes set out in the Annex to this Regulation;

- taking note of the compliance assessment and subsequent monitoring of high-risk artificial intelligence, robotics and related technologies referred to in Article 14 to be carried out by the national supervisory authorities referred to in Article 17;

- developing the application process for the certificate referred to in Article 15 to be issued by the national supervisory authorities referred to in Article 17;

- without prejudice to sectorial legislation, preparing the binding guidelines referred to in Article 14(3) on the methodology to be used by the national supervisory authorities referred to in Article 17;

- coordinating the establishment of the relevant governance standards referred to in Article 16 by the national supervisory authorities referred to in Article 17, including non-binding implementation guidelines for developers, deployers and users on the methodology for compliance with this Regulation;

- cooperating with the national supervisory authorities referred to in Article 17 regarding their contribution to the consistent application of this Regulation throughout the Union pursuant to Article 17(2);

- serving as a centre for expertise by promoting the exchange of information related to artificial intelligence, robotics and related technologies and supporting the development of a common understanding in the Single Market, issuing additional guidance, opinions and expertise to the national supervisory authorities referred to in Article 17, monitoring the implementation of relevant Union law, identifying standards for best practice and, where appropriate, making recommendations for regulatory measures; in doing so, it should liaise with the maximum possible number of relevant stakeholders and ensure that the composition of its decision levels is diverse and ensures gender equality;

- hosting a Working Group on Security and Defence aimed at looking into policy and investment questions specifically related to the ethical use of artificial intelligence, robotics and related technologies in the field of security and defence.

Article 21

Exercise of delegation

1. The power to adopt delegated acts is conferred on the Commission subject to the conditions

laid down in this Article.

2. The power to adopt delegated acts referred to in Article 7(3) and (4) shall be conferred on the Commission for a period of 5 years from (date of entry into force of this Regulation).

3. The delegation of power referred to in Article 7(3) and (4) may be revoked at any time by the European Parliament or by the Council. A decision to revoke shall put an end to the delegation of the power specified in that decision. It shall take effect the day following the publication of the decision in the Official Journal of the European Union or a later date specified therein. It shall not affect the validity of any delegated act already in force.

4. Before adopting a delegated act, the Commission shall consult experts designated by each Member State in accordance with the principles laid down in the Interinstitutional Agreement of 13 April 2016 on Better Law Making.

5. As soon as it adopts a delegated act, the Commission shall notify it simultaneously to the European Parliament and to the Council.

6. A delegated act adopted pursuant to Article 7(3) and (4) shall enter into force only if no objection has been expressed either by the European Parliament or the Council within a period of three months of notification of that act to the European Parliament and the Council or, if, before the expiry of that period, the European Parliament and the Council have both informed the Commission that they will not object. That period shall be extended by three months at the initiative of the European Parliament or of the Council.

Article 22

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 of 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 of artificial intelligence, robotics and related technologies.

“(xxi) Regulation [XXX] of the European Parliament and of the Council on ethical principles for the development, deployment and use artificial intelligence, robotics and related technologies”.’

Article 23

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 24

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.

This Regulation shall be binding in its entirety and directly applicable in all Member States.

ANNEX

Exhaustive and cumulative list of high-risk sectors and of high-risk uses or purposes that entail a risk of breach of fundamental rights and safety rules.

High-risk sectors	• Employment • Education • Healthcare • Transport • Energy • Public sector (asylum, migration, border controls, judiciary and social security services) • Defence and security • Finance, banking, insurance
High-risk uses or purposes	• Recruitment • Grading and assessment of students • Allocation of public funds • Granting loans • Trading, brokering, taxation, etc. • Medical treatments and procedures • Electoral processes and political campaigns • Public sector decisions that have a significant and direct impact on the rights and obligations of natural or legal persons • Automated driving • Traffic management • Autonomous military systems • Energy production and distribution • Waste management • Emissions control

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.

24.6.2020

OPINION OF THE COMMITTEE ON FOREIGN AFFAIRS

for the Committee on Legal Affairs

with recommendations to the Commission on framework of ethical aspects of artificial intelligence, robotics and related technologies

(2020/2012(INL))

Rapporteur for opinion (*): Urmas Paet

(*) Associated committee – Rule 57 of the Rules of Procedure

(Initiative – Rule 47 of the Rules of Procedure)

SUGGESTIONS

The Committee on Foreign Affairs calls on the Committee on Legal Affairs, as the committee responsible:

– to incorporate the following suggestions into its motion for a resolution:

1. Highlights that the security and defence policies of the European Union and its Member States are guided by the principles enshrined in the European Charter of Fundamental Rights and those of the United Nations Charter, and by a common understanding of the universal values of respect for the inviolable and inalienable rights of the human person, human dignity, of freedom, of democracy, of equality and of the rule of law; highlights that all defence-related efforts within the Union framework must respect those universal values whilst promoting peace, security and progress in Europe and in the world; is of the opinion that the use of AI should be based on a common set of ethical principles according to which the use should be: responsible, equitable, traceable, reliable, and governable;

2. Welcomes the endorsement, by the 2019 Meeting of High Contracting Parties to the United Nations Convention on Certain Conventional Weapons (CCW), of 11 Guiding Principles for the development and use of autonomous weapons systems; regrets however the failure to agree on a legally binding instrument regulating lethal autonomous weapons (LAWS), with an effective enforcement mechanism; welcomes and supports the Commission's High-Level Expert Group on Artificial Intelligence 'Ethics Guidelines for Trustworthy AI' published on 9 April 2019 and its position on lethal autonomous weapon systems (LAWS); urges Member States to develop national strategies for the definition and status of lethal autonomous weapons (LAWS) towards a comprehensive strategy at Union level and to promote, together with the Union's High Representaive/Vice-President of the Commission ('HR/VP'), and the Council to the discussion on LAWS in the UN CCW framework and other relevant fora and the establishment of international norms regarding the ethical and legal parameters of the development and use of fully autonomous, semi-autonomous and remotely operated lethal weapons systems; recalls in this respect its resolution on autonomous weapon systems of 12 September 2018 and calls once again for the urgent development and adoption of a common position on lethal autonomous weapon systems, for an international ban on the development, production and use of lethal autonomous weapon systems enabling strikes to be carried out without meaningful human control and without respect for the human-in-the-loop principle, in line with the statement of the world's most prominent AI researchers in their open letter from 2015; welcomes the agreement of Council and Parliament to exclude lethal autonomous weapons 'without the possibility for meaningful human control over the selection and engagement decisions when carrying out strikes' from actions funded under the European Defence Fund; believes that ethical aspects of other AI-applications in defence, such as intelligence, surveillance and reconnaissance (ISR) or cyber operations must not be overlooked, and special attention must be paid to the development and deployment of drones in military operations;

3. Recommends that any European framework regulating the use of artificial intelligence (AI)-enabled systems in defence, both in combat and non-combat situations, must

respect all applicable legal regimes, in particular international humanitarian law and international human rights law, and it must be in compliance with Union law, principles and values; stresses that the Union should play a global role in leading the way towards a credible and binding AI regulatory framework rooted in democratic values and a human-centric approach; calls on the Union and its Member States to develop joint mechanisms to quickly and thoroughly assess the inherent AI-related risks and opportunities with regard to the application of Union law, inspired by the best practices of more advanced Member states, and to provide for necessary adjustment and enforcement where needed, keeping in mind the disparities in terms of technical and security infrastructures throughout the Union;

4. Recognises that unlike defence industrial bases, critical AI innovations could come from small Member States, thus a CSDP-standardized approach should ensure that smaller Member States and SME's are not crowded out. Stresses that a set of common EU AI capabilities matched to a Member States operating concepts can bridge the technical gaps that could leave out states lacking the relevant technology, industry expertise or the ability to implement AI systems in their defence ministries;

5. Emphasises that the geographical scope 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;

6. Underlines that emerging technologies not covered by international law should be judged by the principle of respect for humanity and the dictates of public conscience; underlines that the use and the ethics of AI-enabled systems in defence must be constantly assessed, from the point of view of human rights notably human safety, health and security, freedom, privacy, integrity and dignity and constantly monitored, especially from the point of view of its advantages and disadvantages, as well as its impact on the protection of universal human rights; believes that technological advantages in the field of AI-enabled systems in defence must go hand in hand with an ample discussion on the use of AI and its impact on societies and communities and potential economic and societal benefits, and the risks stemming from the use of AI must be properly communicated;

7. Considers that current and future security and defence-related activities within the Union framework will draw on AI, on robotics and autonomy, and on related technologies and that reliable, robust and trustworthy AI could contribute to a modern and effective military; the Union must therefore assume a leading role in research and development of AI systems in the security and defence field; believes that the use of AI-enabled applications in security and defence could offer a number of direct benefits to the operation commander, such as higher quality collected data, greater situational awareness, increased speed for decision-making, reduced risk of collateral damage thanks to better cabling, protection of forces on the ground, as well as greater reliability of military equipment and hence reduced risk for humans and human casualties; stresses that the development of reliable AI in the field of defence is essential for ensuring European strategic autonomy in capability and operational areas; recalls that AI systems are also becoming key elements in countering emerging security threats, such as cyber and hybrid warfare both in the online and offline spheres; underlines at the same time all the risks and challenges of unregulated use of AI; notes that AI could be exposed to

manipulation, to errors and inaccuracies;

8. Calls for synergies and networks to be established between the various European research centres on AI as well as other multilateral fora, such as the Council of Europe, the United Nations Educational Scientific and Cultural Organization (UNESCO), the Organisation for Economic Co-operation and Development's (OECD),the World Trade Organisation and the International Telecommunications Union (ITU), in order to align their efforts and to better coordinate the development of the AI technology;

9. Stresses that AI technologies are, in essence, dual use, and the development of AI in defence-related activities benefits from exchanges between military and civil technologies; highlights that AI in defence-related activities is a transverse disruptive technology the development of which may provide opportunities for the competitiveness sand the strategic autonomy of the Union;

10. Highlights that, based on the Commission's communication of 8 April 2019 'Building Trust in Human-Centric AI' , whereby technology fully respects human rights and humans retain authority over automated decision-making systems, while complementing and supporting human autonomy and decision making the Union needs a robust AI regulatory framework focused on security and defence, following a path of responsibility and transparency, of protecting our citizens and their data, and of defending our values, that its policies aim at preserving peace, preventing conflicts and strengthening international security, whilst seizing the opportunities that those technologies offer, as well as realising that AI- enabled systems will be a key element in future defence-developments and defensive capabilities;

11. Calls on the Member States and the Commission to ensure that the algorithms used in defence systems, while keeping the necessary confidentiality, are governed by the principle of transparency, including a clear liability regime for the results of AI use; underlines that such algorithms must be constantly adjusted to the progress in AI technologies;

12. Underlines that the Union must be at the forefront of supporting multilateral efforts in the framework of the UN CCW Governmental Expert Group and other relevant fora, to discuss an effective international regulatory framework that ensures meaningful human control over autonomous weapon systems in order to master those technologies by establishing well defined, benchmark-based processes and adopting legislation for their ethical use, in consultation with military, industry, law enforcement, academia and civil society stakeholders, to understand the related ethical aspects and to contain the inherent risks of such technologies and prevent use for malicious purposes; those include in particular unintended harm to persons, be it material or immaterial, such as breach of fundamental rights or physical harm; the Union working together with the Member States must determine the appropriate liability regimes applicable to innovations in AI and other immersive technologies in the field of security and defence, thus establishing a legal basis for accountability and traceability mechanisms; highlights that Union legislation and normative frameworks must not be overtaken by any future technological advances, progress in AI and new methods of warfare and hence must be supported by meaningful monitoring schemes to be constantly adjusted to prevent legal loopholes or grey zones; underlines that further AI research and development should ensure that AI enabled systems are better equipped to understand unique contexts;

13. Endorses the key principle “ethics-by-design”, by which ethical principles are embedded into AI products and services from the outset of the design process;

14. Recalls that most of the current military powers worldwide have already engaged in significant R&D efforts related to the military dimension of AI; considers that the Union must see to it that it does not lag behind in this regard; stresses that for any defence application of AI enabled systems, the Union should set technical and organisational standards, in accordance with the principle of “Security by Design”, allowing for specific human oversight, to ensure the resilience of such systems against vulnerabilities that can be exploited by external attacks, cyber-attacks and digital influence targeting the data, the model or the underlying infrastructure, both software and hardware, as well as their compliance with the highest possible reliability standards, active monitoring and supervision as regards the collection, storage and exploitation of operational data throughout a system’s entire lifecycle; emphasises the importance for transparency and accountability of AI algorithms; notes the important distinction between transparency of algorithms and transparency of the use of algorithms; stresses that AI systems and applications intended to extract and synthesise data, and extrapolate results therefrom to inform decisions for matters relating to defence and national security, must be specific in scope and comply with the provisions set out in the current regulatory framework in terms of gathering and processing data; stresses that AI applications designed to process data for intelligence purposes in defence related activities should comply with data processing standards to avoid risks of unintended surveillance or infringement of individual rights; believes that for high-risk applications of AI-enabled technologies like facial recognition which lack a definitive regulatory framework at the EU level, the Union must ensure that their development and deployment is rightful, proportional and respects the rights of individuals; stresses that competent national law enforcement authorities must respect relevant legislation while developing and deploying AI-enabled systems and technologies to maintain public order so as to mitigate the disproportionate risks of predictive policing; recognises that the primary guarantor of Euro-Atlantic security is NATO and calls for increased cooperation within the NATO Alliance for the establishment of common standards and interoperability of AI systems in defence; stresses that the transatlantic relationship is crucial in preserving shared values and in countering future and emerging threats;

15. Highlights the need to adopt clear reliability, safety and security provisions and requirements with proper certifications for AI-systems in security and defence, to introduce transparency criteria in the various phases, namely design, production and operation, and to carry out constant monitoring, regular tests and verification throughout the entire life cycle; underlines the necessity of ensuring compliance with applicable standards and obtained certifications where AI modifies e.g. through machine learning the functionality and behaviour of systems in which it is integrated, in order to ensure full traceability, explainability and accountability of decisions made with involvement of AI and their outcomes, as well as meaningful human control when such systems could kill humans;

16. Calls on the Commission to embed cybersecurity capacity-building in its industrial policy in order to ensure the development and deployment of safe, resilient and robust AI-enabled and robotic systems; calls on the Commission to explore the use of blockchain-based cybersecurity protocols and applications to improve the resilience, trust and robustness of AI infrastructures through disintermediated models of data

encryption; encourages European stakeholders to research and engineer advanced features that would facilitate the detection of corrupt and malicious AI-enabled & robotics systems which could undermine the security of the Union and of citizens;

17. Stresses that all AI-systems in defence must have a concrete and well-defined mission framework, whereby humans retain the agency to detect and disengage or deactivate deployed systems should they move beyond the mission framework defined and assigned by a human commander, or engage in any escalatory or unintended action; considers that AI-enabled systems, products and technology intended for military use should be equipped with a 'black box' to record every data transaction carried out by the machine;

18. Underlines that the entire responsibility and accountability for the decision to design, develop, deploy and use AI-systems must rest on human operators, as there must be meaningful human monitoring and control over any weapon system and human intent in the decision to use force in the execution of any decision of AI-enabled weapons systems that might have lethal consequences; underlines that human control should remain effective for the command and control of AI-enabled systems, following the human-in-the loop, human-on-the loop and human-in-command principles at the military leadership level; stresses that AI-enabled systems must allow the military leadership of armies to assume its full responsibility and accountability for the use of lethal force and exercise the necessary level of judgment, which machines cannot be endowed with as it must be based on distinction, proportionality and precaution, for taking lethal or large-scale destructive action by means of such systems; stresses the need to establish clear and traceable authorisation and accountability frameworks for the deployment of smart weapons and other AI-enabled systems, using unique user characteristics like biometric specifications to enable deployment exclusively by authorised personnel;

19. Calls on the Commission to work together with Member States' national competent authorities and other stakeholders participating in the development and deployment of AI-enabled systems, products and technologies to establish a safe, secure and resilient framework whereby the source code of AI-enabled systems is shared, monitored and verified to mitigate potential deviations from the governing principles and ethical framework underpinning AI technology in the field of security and defence; suggests to the Commission that the Union must retain ownership of the intellectual property of Union-funded research on AI-enabled systems, products and technologies in security and defence;

20. Underlines that the Union must promote better understanding of the military implications, advantages and opportunities and weaknesses of AI, of robotics and of autonomous functions and features, including the potential for the European defence industry, by working alongside military officials; considers that the Union needs to promote the acquisition of the necessary skills and knowledge on technology development processes and operational methods throughout the supply chain and over the full lifecycle of AI-enabled military capabilities; underlines the urgent need for establishing increased European strategic and technological independence in the field of AI-enabled systems, including the critical infrastructure it relies on;

21. Believes that enhanced cooperation between Member States and the Commission is

necessary to guarantee coherent cross-border rules in the Union, to encourage the collaboration between European industries and allow the development and deployment of AI-enabled technologies consistent with the prescribed safety and security standards, and the ethical framework governing the development and deployment of AI technology;

22. Recognises, in the hybrid and advanced warfare context of today, that the volume and velocity of information during the early phases of a crisis might be overwhelming for human analysts and that an AI system could process the information to ensure that human decision-makers are tracking the full spectrum of information within an appropriate timeframe for a speedy response;

23. Underlines the importance of investing in the development of human capital for artificial intelligence, fostering the necessary skills and education in the field of security and defence AI technologies with particular focus on ethics of semi-autonomous and autonomous operational systems based on human accountability in an AI-enabled world; stresses in particular the importance of ensuring that ethicists in this field have appropriate skills and receive proper training ; calls on the Commission to present as soon as possible its "Reinforcement of the Skills Agenda", announced in the White Paper on Artificial Intelligence on the 19th February 2020;

24. Stresses that quantum computing could represent the most revolutionary change in conflict since the advent of atomic weaponry and thus urges that the further development of quantum computing technologies be a priority for the Union and Member States; recognises that acts of aggression, including attacks on critical infrastructure, aided by quantum computing will create a conflict environment in which the time to make decisions will be compressed dramatically from days and hours to minutes and seconds, forcing Member States to develop capabilities that protect themselves and train both its decision makers and military personnel to respond effectively within such timeframes;

25. Stresses the need to overcome the current fragmentation within the Union as regards national AI-related law, research, innovation and expertise in the area of AI, which endangers the functioning of the internal market and the objective of ensuring that there is reliable and secure development of AI in Europe; in this respect welcomes the inclusion of AI-related projects under the European Industrial Development Programme(EDIDP); believes that the future European Defence Fund (EDF) and the Permanent structured cooperation (PESCO) also offer well adapted frameworks for future AI-related projects that would help to better streamline Union efforts in this field, and promote at the same time the Union’s objective of strengthening human rights, international law, and multilateral solutions; stresses that AI-related projects should be synchronized with the wider Union civilian programmes devoted to AI; notes that in line with the European Commission’s White Paper on AI excellence and testing centres concentrating on research and development of AI in the field of security and defence should be established with vigorous specifications underpinning the participation of and investment from private stakeholders;

26. Highlights that the Union needs to strive for strategic resilience so that it is never again found unprepared in times of crisis, and underlines that, especially in as far as artificial intelligence and its application to defence and security are concerned, this is of crucial

significance; emphasises that supply-chains for AI systems in defence and security that can lead to technological dependence should be recalibrated and such dependencies should be phased-out; calls for increased investment in European AI for defence and in the critical infrastructure that sustains it;

27. Emphasises that the development of AI that respects fundamental rights and supports the public interest requires the strategic pooling and sharing of data in the Union between private and public entities, as well as the strengthening of a Union AI ecosystem, which involves public, private, and civil society stakeholders; calls on the Commission to foster dialogue, closer cooperation and synergies among Member States, researchers, academics, civil society actors and the private sector, in particular leading companies and enterprises, and the military so as to have inclusive policymaking processes when it comes to defence-related AI regulations, harness the potential of AI to the fullest, while fostering a better understanding of risks and benefits, as well as ensuring maximum operational security;

28. Highlights that, in the context of the widespread disinformation war, particularly driven by non-European actors, AI technologies might have ethically adverse effects by exploiting biases in data and algorithms or by deliberately alternating learning data by a third country, and could be also exposed to other forms of dangerous malign manipulation in unpredictable ways and with incalculable consequences; there is therefore an increased need for the Union to continue investment in research, analysis, innovation and cross-border and cross-sector knowledge transfer in order to develop AI technologies that would be clearly void of any sort of profiling, bias and discrimination, and could effectively contribute to combating fake news and disinformation, while at the same time respecting data privacy and the European legal framework;

29. Stresses the importance of the creation of an ethical code of conduct underpinning the deployment of weaponised AI-enabled systems in military operations, similar to the existing regulatory framework prohibiting the deployment of chemical and biological weapons; is of the opinion that the Commission should initiate the creation of standards on the use of AI-enabled weapons systems in warfare in accordance with international humanitarian law, and the Union should pursue the international adoption of such standards; considers that the Union should engage in AI diplomacy in international fora with like-minded partners like the G7, the G20, and the OECD;

30. Takes note of the Commission's White Paper on Artificial Intelligence of 19 February 2020 and regrets that military aspects were not taken into account; calls on the Commission and on the HR/VP to present, also as part of an overall approach, a sectoral AI strategy for defence-related activities within the Union framework, that ensures both respect for citizens' rights and the Union's strategic interests, and that is based on a consistent approach spanning from the inception of AI-enabled systems to their military uses, and to establish a Working Group on Security and Defence within the High-Level Expert Group on Artificial Intelligence that should specifically deal with policy and investment questions as well as ethical aspects of AI in the field of security and defence; calls on the Council, the Commission and on the VP/HR to enter in a structured dialogue with Parliament to that end.

INFORMATION ON ADOPTION IN COMMITTEE ASKED FOR OPINION

Date adopted	22.6.2020
Result of final vote	+: 60 –: 7 0: 2
Members present for the final vote	Alviina Alametsä, Maria Arena, Petras Auštrevičius, Traian Băsescu, Lars Patrick Berg, Anna Bonfrisco, Reinhard Bütikofer, Fabio Massimo Castaldo, Susanna Ceccardi, Włodzimierz Cimoszewicz, Katalin Cseh, Tanja Fajon, Anna Fotyga, Michael Gahler, Kinga Gál, Sunčana Glavak, Raphaël Glucksmann, Klemen Grošelj, Bernard Guetta, Márton Gyöngyösi, Sandra Kalniete, Karol Karski, Dietmar Köster, Stelios Kouloglou, Andrius Kubilius, Ilhan Kyuchyuk, David Lega, Miriam Lexmann, Nathalie Loiseau, Antonio López-Istúriz White, Claudiu Manda, Lukas Mandl, Thierry Mariani, David McAllister, Vangelis Meimarakis, Sven Mikser, Francisco José Millán Mon, Javier Nart, Gheorghe-Vlad Nistor, Urmas Paet, Kostas Papadakis, Tonino Picula, Manu Pineda, Kati Piri, Giuliano Pisapia, Diana Riba i Giner, María Soraya Rodríguez Ramos, Nacho Sánchez Amor, Isabel Santos, Jacek Saryusz-Wolski, Andreas Schieder, Radosław Sikorski, Sergei Stanishev, Tineke Strik, Hermann Tertsch, Hilde Vautmans, Harald Vilimsky, Idoia Villanueva Ruiz, Thomas Waitz, Witold Jan Waszczykowski, Charlie Weimers, Isabel Wiseler-Lima, Željana Zovko
Substitutes present for the final vote	Katarina Barley, Nicolas Bay, Arnaud Danjean, Katrin Langensiepen, Hannah Neumann, Mick Wallace

FINAL VOTE BY ROLL CALL IN COMMITTEE ASKED FOR OPINION

60	+
EPP	Traian Băsescu, Arnaud Danjean, Michael Gahler, Kinga Gál, Sunčana Glavak, Sandra Kalniete, Andrius Kubilius, David Lega, Miriam Lexmann, Antonio López-Istúriz White, Lukas Mandl, David McAllister, Vangelis Meimarakis, Francisco José Millán Mon, Gheorghe-Vlad Nistor, Radosław Sikorski, Isabel Wiseler-Lima, Željana Zovko
S&D	Maria Arena, Katarina Barley, Włodzimierz Cimoszewicz, Tanja Fajon, Raphaël Glucksmann, Dietmar Köster, Claudiu Manda, Sven Mikser, Tonino Picula, Kati Piri, Giuliano Pisapia, Nacho Sánchez Amor, Isabel Santos, Andreas Schieder, Sergei Stanishev
RENEW	Petras Auštrevičius, Katalin Cseh, Klemen Grošelj, Bernard Guetta, Ilhan Kyuchyuk, Nathalie Loiseau, Javier Nart, Urmas Paet, María Soraya Rodríguez Ramos, Hilde Vautmans
ID	Anna Bonfrisco, Susanna Ceccardi
VERTS	Alviina Alametsä, Reinhard Bütikofer, Katrin Langensiepen, Hannah Neumann, Diana Riba i Giner, Tineke Strik, Thomas Waitz
ECR	Anna Fotyga, Karol Karski, Jacek Saryusz-Wolski, Hermann Tertsch, Witold Jan Waszczykowski, Charlie Weimers
NI	Fabio Massimo Castaldo, Márton Gyöngyösi

7	-
GUE	Stelios Kouloglou, Manu Pineda, Idoia Villanueva Ruiz, Mick Wallace
ID	Nicolas Bay, Thierry Mariani
NI	Kostas Papadakis

2	0
ID	Lars Patrick Berg, Harald Vilimsky

Key to symbols:
+ : in favour
- : against
0 : abstention

8.7.2020

OPINION OF THE COMMITTEE ON THE INTERNAL MARKET AND CONSUMER PROTECTION

for the Committee on Legal Affairs

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

Rapporteur for opinion: Alexandra Geese

(Initiative – Rule 47 of the Rules of Procedure)

(*) Associated committee – Rule 57 of the Rules of Procedure

SUGGESTIONS

The Committee on the Internal Market and Consumer Protection calls on the Committee on Legal Affairs, as the committee responsible:

– to incorporate the following suggestions into its motion for a resolution:

A. Whereas ethical guidance, such as the principles adopted by the High-Level Expert Group on Artificial Intelligence, provides a good starting point, but is not enough to ensure that businesses act fairly and guarantee effective consumer protection;

Scope

1. Underlines the importance of an EU regulatory framework focusing on the ethical aspects of artificial intelligence (AI), robotics and related technologies being applicable where consumers within the Union are users of, subject to, targeted by, or directed towards an algorithmic system, irrespective of the place of establishment of the entities that develop, sell or employ the system; furthermore, believes that, in the interest of legal certainty, the rules set out should apply to all developers and across the value chain, namely the development, deployment and use of the relevant technologies and their components, and should guarantee a high level of consumer protection; reiterates the importance of Union values as referred to in the Treaties regarding the importance of the protection of personal data and of explicit, informed consent and proposes that those rules take into account the

lessons drawn from the implementation of Regulation (EU) 2016/679[1] (GDPR), which is considered a global benchmark; considers that a legal representative, established in in the Union, to whom requests could be addressed, in order, for example, to allow for consumer redress, is important for the enforcement of a future EU regulatory framework;

2. Notes that the EU regulatory framework should apply to algorithmic systems, including the fields of AI, the internet of things, machine learning, rule-based systems, automated and assisted decision-making processes and robotics; further notes that standardised icons could be developed to help explain such systems to consumers whenever those systems are characterised by complexity or are enabled to make decisions that impact the lives of consumers significantly;

3. Stresses that the EU regulatory framework must have a human-centric approach and lead to the development of systems which incorporate European ethical values by design; considers that an EU regulatory framework that focuses on Union values as referred to in the Treaties would represent added value providing Europe with a unique competitive advantage and would make a significant contribution to the well-being and prosperity of Union citizens and businesses, as well as boost the internal market; underlines that an ethical framework for AI also represents added value as regards promoting innovation on the internal market;

4. Points out that the legislative framework introduced by Decision No 768/2008/EC[2] provides for a harmonised list of obligations for producers, importers and distributors, encourages the use of standards and provides for several levels of control depending on the dangerousness of the product; considers that that framework should also apply to AI embedded products;

5. Stresses that any future regulation should follow a differentiated risk-based approach to enable the development and deployment of secure and trustworthy systems, with clear criteria and indicators, followed by an impartial legal assessment based on the potential harm or breaches of rights of the individual, as well as for the whole of society, taking into account the specific context of use of the algorithmic system; stresses that legal obligations and certification requirements should gradually increase with the identified risk level; highlights that in the lowest risk category there should be no additional legal obligations; notes that algorithmic systems that may harm an individual, or cause potential breaches of an individual's rights, or impact an individual's access to public benefits shall not be deemed to be in the lowest risk category; notes that the risk-based approach should follow clear and transparent rules providing enough legal certainty whilst being future-proof; calls for a uniform implementation of the system of risk classification and related legal obligations to ensure a level-playing field among the Member States and to prevent a fragmentation of the internal market; stresses that the risk assessment of a specific system must be subject to

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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 Decision No 768/2008/EC of the European Parliament and of the Council of 9 July 2008 on a common framework for the marketing of products, and repealing Council Decision 93/465/EEC (OJ L 218, 13.8.2008, p. 82)

regular re-evaluation;

6. Recalls that the Commission should examine the existing EU legal framework and its application, including the consumer law *acquis*, product liability legislation, product safety legislation and market surveillance legislation, in order to identify legal gaps, as well as existing regulatory obligations; considers that this is necessary in order to ascertain whether the existing EU legal framework is able to respond to the emergence of AI, robotics and related technologies and whether it is able to ensure a high level of consumer protection;

Data Management

7. Underlines the importance of an EU ethical and regulatory framework including in particular provisions requiring high quality data to train algorithmic systems in relation to the purpose of their use; in that regard, highlights the necessity of ensuring the representativeness of the training data used and, where possible, the de-biasing of data sets, as well as of data and aggregation standards in order to improve the output of algorithmic systems and boost consumer trust and acceptance; stresses that those data sets should be auditable by the competent authorities whenever called upon to ensure their conformity with the previously referenced principles;

Consumer protection: transparency and explainability of algorithms

8. Underlines that consumer trust is essential for the development and implementation of AI, robotics and related technologies which can carry inherent risks when they are based on opaque algorithms and biased data sets; believes that consumers should have the right to be adequately informed in an understandable, timely, standardised, accurate and accessible manner about the existence, reasoning, possible outcome and impacts for consumers of algorithmic systems, about how to reach a human with decision-making powers, and about how the system's decisions can be checked, meaningfully contested and corrected; recalls that humans must always be able to overrule automated decisions; believes that consumers should also be protected by the right to switch off or limit an AI system using personalisation where possible; stresses the importance of proportionality in the development of such a transparency framework to avoid creating an unnecessary burden on start-ups and small and medium enterprises (SMEs) operating in low-risk categories;

9. Stresses the need to effectively address the challenges created by algorithmic systems and to ensure that consumers are empowered and properly protected; underlines the need to look beyond the traditional principles of information and disclosure on which the consumer *acquis* has been built, as stronger consumer rights and clear limitations regarding the development and use of algorithmic systems will be necessary to ensure technology contributes to improving consumers' lives and evolves in a way that respects fundamental and consumer rights and European values;

10. Considers that a value-sensitive design approach is strongly needed to create the conditions for widespread social acceptance of AI for consumers; considers that ethical values of fairness, accuracy, confidentiality and transparency should be the basis of AI, which in this context entails that the system's operations should be such that they do not generate unfairly biased outputs;

11. Recalls the importance of ensuring the availability of effective remedies for consumers and calls on the Member States and national market surveillance authorities to ensure that

accessible, affordable, independent and effective procedures and review structures are available in order to guarantee an impartial human review of all claims of violations of consumer rights through the use of algorithmic systems, whether stemming from public or private sector actors; urges that dispute resolution and collective redress mechanisms in line with the Directive of the European Parliament and of the Council on representative actions for the protection of the collective interests of consumers and repealing Directive 2009/22/EC[3] should be made available to challenge the introduction or ongoing use of a system entailing a risk for consumer rights violations, or to remedy a violation of rights; asks the Commission to ensure that national and European consumer organisations have sufficient funding to assist consumers in exercising their right to a remedy in cases where decisions based on AI applications infringe consumer rights;

12. Stresses that where money originating from public sources significantly contributes to the development or implementation of an algorithmic system, in addition to open procurement and open contracting standards, the code, the generated data -as far as it is non-personal- and the trained model could be public by default upon agreement with the developer, in order to guarantee transparency, enhance cybersecurity and enable the reuse thereof so as to foster innovation; stresses that, in this way, the full potential of the single market can be unlocked, avoiding market fragmentation;

Internal market: consumer information and awareness

13. Underlines the importance of ensuring that the interests of all consumers, including consumers who are marginalised or in vulnerable situations, such as persons with disabilities, are adequately taken into account and represented in a future EU regulatory framework; notes that for the purpose of analysing the impacts of algorithmic systems on consumers, access to data could be extended to appropriate parties, in particular independent researchers, media and civil society organisations, where possible via Application Programming Interfaces (APIs), while fully respecting Union data protection and privacy legislation and trade secret legislation; recalls the importance of educating consumers to be more informed and skilled when dealing with algorithmic systems, in order to protect them from potential risks and uphold their rights; considers that AI, the internet of things, and other emerging technologies have enormous potential to deliver opportunities for consumers to be able to have access to several amenities which facilitate their daily lives in numerous ways and allow for better products and services, while also benefitting consumers in terms of fostering better market surveillance, as long as all applicable principles, conditions (including transparency and auditability), and regulations continue to apply;

14. Underlines the importance of achieving a high level of overall digital literacy and training highly skilled professionals in this area as well as ensuring the mutual recognition of such qualifications throughout the Union; highlights the need of having diverse teams of developers and engineers working alongside key societal actors to prevent gender and cultural biases being inadvertently included in AI algorithms, systems and applications; supports the creation of educational curricula and public-awareness activities concerning the societal, legal, and ethical impact of AI;

15. Calls on the Commission to promote and fund the development of human-centric AI, robotics and related technologies that address environment and climate challenges and that ensure equal access to and enjoyment of fundamental rights through the use of fiscal,

[3] COD (2018)0089, under publication.

procurement, or other incentives;

16. Underlines that AI and algorithmic systems should be legally compliant, robust, reliable and secure by design; calls on the Commission to ensure that the Union's regulatory approach to algorithmic systems includes appropriate measures to make it possible for such systems to be subject to independent control and oversight;

Market surveillance

17. Calls for the establishment of a European centre of expertise strengthening Union capacities and building as far as possible on existing structures to promote the exchange of information related to algorithmic systems between the Member States' authorities and to support the development of a common understanding in the single market by issuing guidance, opinions and expertise to Member States' authorities, monitoring the implementation of relevant Union legislation, addressing potential consumer protection issues, identifying standards for best practice, and, where appropriate, making recommendations for regulatory measures; further calls for this structure to be appropriately advised by stakeholder organisations, such as consumer protection organisations, in order to ensure wide consumer representation; considers that due to the disproportionate impact of algorithmic systems on women and minorities, the decision levels of such a structure should be diverse and gender balanced; emphasises that Member States must develop risk-management strategies for AI in the context of their national market surveillance strategies;

18. Calls for the Commission to propose measures for data traceability, having in mind both the legality of data acquisition and the protection of consumer rights and fundamental rights; stresses, meanwhile, that the data sets, algorithms and processes used in the development and deployment of algorithmic systems, including those of data collection and data labelling, should be documented in accordance with the industry standard; notes that it is essential that the risk assessment documentation, software documentation, the algorithms and data sets used or produced by artificial intelligence, robotics, and related technologies be accessible and explainable to market surveillance authorities, while respecting Union law and trade secrets; further notes that such documentation should be stored by those who are involved in the different stages of the development of algorithmic systems; notes that additional prerogatives should be given to market surveillance authorities in that respect; considers that an examination of the current market surveillance legislation might be necessary to avoid it becoming obsolete and ensure that it responds ethically to the emergence of AI, robotics and related technologies;

19. Calls for the designation, and sufficient funding by each Member State, of a competent national authority for monitoring the application of the provisions related to algorithmic systems; stresses the need for national market surveillance authorities to be reinforced in terms of capacity, skills, and competences in AI as well as knowledge about the specific risks of AI;

20. Calls for a strong coordination of Member State authorities and the establishment of a European market surveillance board for algorithmic systems, composed of national authorities, to ensure effective oversight, a European level playing field and to avoid fragmentation of the internal market;

21. Acknowledges the valuable output of the High-Level Expert Group on Artificial Intelligence, particularly 'The Ethics Guidelines for Trustworthy Artificial Intelligence';

suggests that that group comprising representatives from academia, civil society and industry, as well as the European AI Alliance, might provide expertise to the European market surveillance board for algorithmic systems;

22. Notes that, particularly in business-to-consumer domains, systems should be user-centric and designed in a way that allows everyone to use AI products or services, regardless of their age, gender, abilities or characteristics; notes that accessibility to this technology for persons with disabilities, is of particular importance; notes that AI systems should not have a one-size-fits-all approach and should consider universal design principles addressing the widest possible range of users, following relevant accessibility standards; stresses that this will enable individuals to have equitable access to and to actively participate in existing and emerging computer-mediated human activities and assistive technologies.

INFORMATION ON ADOPTION IN COMMITTEE ASKED FOR OPINION

Date adopted	7.7.2020
Result of final vote	+: 39 –: 1 0: 4
Members present for the final vote	Alex Agius Saliba, Andrus Ansip, Alessandra Basso, Brando Benifei, Adam Bielan, Hynek Blaško, Biljana Borzan, Vlad-Marius Botoş, Markus Buchheit, Dita Charanzová, Deirdre Clune, David Cormand, Petra De Sutter, Carlo Fidanza, Evelyne Gebhardt, Alexandra Geese, Sandro Gozi, Maria Grapini, Svenja Hahn, Virginie Joron, Eugen Jurzyca, Arba Kokalari, Marcel Kolaja, Kateřina Konečná, Andrey Kovatchev, Jean-Lin Lacapelle, Maria-Manuel Leitão-Marques, Adriana Maldonado López, Antonius Manders, Beata Mazurek, Leszek Miller, Kris Peeters, Anne-Sophie Pelletier, Christel Schaldemose, Andreas Schwab, Tomislav Sokol, Ivan Štefanec, Kim Van Sparrentak, Marion Walsmann, Marco Zullo
Substitutes present for the final vote	Pascal Arimont, Maria da Graça Carvalho, Edina Tóth, Stéphanie Yon-Courtin

FINAL VOTE BY ROLL CALL IN COMMITTEE ASKED FOR OPINION

39	+
EPP	Pascal Arimont, Maria da Graça Carvalho, Deirdre Clune, Arba Kokalari, Andrey Kovatchev, Antonius Manders, Kris Peeters, Andreas Schwab, Tomislav Sokol, Ivan Štefanec, Edina Tóth, Marion Walsmann
S&D	Alex Agius Saliba, Brando Benifei, Biljana Borzan, Evelyne Gebhardt, Maria Grapini, MariaManuel Leitão-Marques, Adriana Maldonado López, Leszek Miller, Christel Schaldemose
RENEW	Andrus Ansip, VladMarius Botoş, Dita Charanzová, Sandro Gozi, Svenja Hahn, Stéphanie YonCourtin
GREENS/EFA	David Cormand, Petra De Sutter, Alexandra Geese, Marcel Kolaja, Kimvan Sparrentak
ECR	Adam Bielan, Carlo Fidanza, Eugen Jurzyca, Beata Mazurek
EUL/NGL	Kateřina Konečná, AnneSophie Pelletier
NI	Marco Zullo

1	-
ID	Hynek Blaško

4	0
ID	Alessandra Basso, Markus Buchheit, Virginie Joron, JeanLin Lacapelle

Key to symbols:
+ : in favour
- : against
0 : abstention

16.7.2020

OPINION OF THE COMMITTEE ON TRANSPORT AND TOURISM

for the Committee on Legal Affairs

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

Rapporteur for opinion: Valter Flego

(*) Associated committee – Rule 57 of the Rules of Procedure

(Initiative – Rule 47 of the Rules of Procedure)

SUGGESTIONS

The Committee on Transport and Tourism calls on the Committee on Legal affairs, as the committee responsible, to incorporate the following suggestions into its motion for a resolution:

A. whereas Artificial Intelligence (AI) is a form of technology that is of strategic importance for the transport sector, and is expected to benefit citizens and society, by improving the quality of life, raising the safety level of all modes of transport, and creating new employment opportunities and more sustainable business models; whereas AI has the potential to transform society significantly, in particular, if made widely available and accessible;

B. whereas the full potential of AI in the transport sector can only be exploited if users are aware of the potential benefits and challenges that such technology brings; whereas it is necessary to address this issue in education and training, including in terms of promoting digital inclusion, and to conduct information campaigns at Union level that give an accurate representation of all aspects of AI development;

C. whereas a European approach to AI, robotics and related technologies needs to be in accordance with ethical principles in order to ensure that AI, robotics and related technologies are human-centric, to enhance human well-being, safety, the well-being of society and the environment, to address the relevant ethical dilemmas, to fully respect Union fundamental rights, values and principles, and to be fully in line with Union privacy and data protection legislation; whereas this approach will also need to address issues regarding the quality of data sets used in algorithmic systems, as well as the algorithms themselves, and data and aggregation standards;

D. whereas trustworthy AI must be based on four ethical principles: respect for human

autonomy, prevention of harm, fairness and explainability; whereas the respect of those ethical principles necessitates adopting specific rules for the Union's transport sector;

E. whereas human error is still involved in about 95% of all road traffic accidents in the Union; whereas the Union aimed to reduce annual road fatalities in the Union by 50% by 2020 compared to 2010, but, in view of stagnating progress, renewed its efforts in its Road Safety Policy Framework 2021 - 2030 - Next steps towards "Vision Zero"; whereas in this regard, AI, automation and other new technologies have great potential and vital importance for increasing road safety by reducing the possibilities for human error;

F. whereas AI, automation and other new technologies can also contribute to reducing traffic congestion and emissions of greenhouse gases and air pollutants;

G. whereas the production of ethically responsible, human-centred and technologically robust AI, robotics and related technologies in the transport sector present Union businesses, including SMEs, with a business opportunity to become global leaders in this area;

H. whereas such new business opportunities can contribute to the recovery of Union industry after the current health and economic crisis and to making greater use of AI technology in the transport industry; whereas such opportunities will create new jobs, as the uptake of AI and related technologies has the potential to increase businesses' productivity levels and contribute to efficiency gains; whereas innovation programs in this area can enable regional clusters to thrive;

I. whereas a European approach to the development of AI, robotics and related technologies in transport has the potential to increase the global competitiveness and strategic autonomy of the Union economy;

J. whereas for sectors like public transport, AI systems for intelligent transport systems can be used to minimise queuing, optimise routing, enable persons with disabilities to be more independent, and increase energy efficiency thereby enhancing decarbonisation efforts and reducing the environmental footprint;

1. Highlights the potential of using AI, robotics and related technologies for all autonomous means of road, rail, waterborne and air transport, and also for boosting the modal shift and intermodality, as such technologies can contribute to finding the optimal combination of modes of transport for the transport of goods and passengers; furthermore, stresses their potential to make transport, logistics and traffic flows more efficient and to make all modes of transport safer, smarter, and more environmentally friendly; points out that an ethical approach to AI can also be seen as an early warning system, in particular as regards the safety and efficiency of transport;

2 Highlights the fact that the global competition between companies and economic regions means that the Union needs to promote investments and strengthen the international competitiveness of companies operating in the transport sector, by establishing an environment favourable for the development and application of AI solutions and further innovations, in which Union-based undertakings can become world leaders in the development of AI technologies;

3. Stresses that the EU transport sector needs an update of the regulatory framework concerning such emerging technologies and their use in the transport sector and a clear ethical

framework for achieving trustworthy AI, including safety, security, the respect of human autonomy, oversight and liability aspects, which will increase benefits that are shared by all and will be key to boosting investment in research and innovation, development of skills and the uptake of AI by public services, SMEs, start-ups and businesses and at the same time ensuring data protection as well as interoperability, without imposing an unnecessary administrative burden on businesses and consumers; stresses that it is crucial to ensure that any update of the regulatory framework concerning these emerging technologies is always based on a real need and complies with the principle of better regulation and in this regard;

a) calls on the Commission to provide for a clear framework of ethical principles for the development, deployment and use of AI, robotics and related technologies in the transport sector; any AI, robotics and related technologies in the transport sector must be developed, deployed and used in accordance with those ethical principles;

b) recommends the establishment of guidelines for a harmonised risk classification of AI-enabled technologies in all modes of transport, covering vehicle functions allocated to humans and to AI, and clarifying responsibilities and requirements as regards safety;

c) calls on the Commission to explore the use of the existing European market surveillance structure for algorithmic systems, including the associated data protection provisions, issuing guidance, opinions and expertise to Member States' authorities, including on interoperability.

d) calls on the Commission to set up an AI risk classification scheme for intelligent transport systems, in line with the High Level Expert Group's assessments, in order to respond better to the emerging needs of the transport sector;

e) calls on the Commission to devote particular attention to the situation of SMEs and to design future legislation in such a way as to improve the opportunities for such undertakings to develop and use AI technology;

f) considers it necessary to provide detailed information to end-users regarding the operation of transport systems and AI-based vehicles;

4. Highlights that the European approach to AI technology should secure people's trust, serve the public interest, and strengthen shared social responsibility; considers the development of trustworthy, ethically responsible and technically robust AI to be an important enabler for sustainable and smart mobility that is safe and accessible; in this regard, calls on the Commission to continue to promote the uptake of AI in the transport sector and to propose, in order to ensure that Union fundamental rights are respected, corresponding changes to Union legislation without delay and in close cooperation with all stakeholders in the transport sector;

5. Stresses that the development and deployment of AI enabling safe and accessible transport services;

6. Recommends the development of Union-wide trustworthy AI standards for all modes of transport, including the automotive industry, concerning safety, interoperability, technical robustness, reparability and recyclability of related hardware, including to deal with concerns relating to resource efficiency, privacy, data protection and transparency, and for testing of AI-enabled vehicles and related products and services;

7. Calls on the Commission to work closely with Member States on the design, implementation and enforcement of trustworthy AI standards in the Union; notes that the Union has the potential to become a global leader in promoting a socially responsible and sustainable approach to AI technology and its use;

8. Calls on the Commission to explore the possibility of entrusting one or several relevant existing agencies, institutions or bodies at Union level with monitoring, enforcement and sanction mechanisms and to explore how the existing instruments of supervision and control in the transport sector can be equipped and used to take action, in order to ensure that there is oversight at Union level and enable the Commission to take action if an AI system used in transport violates fundamental rights or the European ethical and security framework;

9. Calls on the Commission to further support the development of trustworthy AI systems in order to render transport safer, more efficient, accessible, affordable and inclusive, including for persons with reduced mobility, particularly persons with disabilities, taking account of Directive (EU) 2019/882 of the European Parliament and of the Council[1] and of Union law on passenger rights;

10. Draws attention to the high added-value provided by autonomous vehicles for persons with reduced mobility, as such vehicles allow them to participate more effectively in individual road transport and thereby facilitate their daily lives;

11. Stresses the importance of accessibility, especially when designing MaaS-systems (Mobility as a Service);

12. Underlines the critical importance for data science in order to design discrimination-free AI systems and prevent damaged data to be used; furthermore, recommends to follow procedures for data processing compliant with the GDPR and respecting the principles of confidentiality and non-discrimination;

13. Notes that AI systems could help to reduce the number of road fatalities significantly, for instance through better reaction times and better compliance with rules; considers however that it will be impossible for use of autonomous vehicles to result in the elimination of all accidents and underlines that this makes the explainability of AI decisions increasingly important in order to justify shortcomings and unintended consequences of AI decisions;

14. Takes the view that it must always be possible to explain AI decisions, as well as any relevant data underpinning those decisions, to end-users and other stakeholders in non-technical terms;

15. Notes that the development and implementation of AI in the transport sector will not be possible without modern infrastructure, which is an essential part of intelligent transport systems; stresses that the persistent divergences in the level of development between Member States create the risk of depriving the least developed regions and their inhabitants of the benefits brought by the development of autonomous mobility; calls for an assessment of the challenges for the future of the labour market due to the development of AI technologies in the transport sector, and for the modernisation of infrastructure in the Union, including its

[1] Directive (EU) 2019/882 of the European Parliament and of the Council of 17 April 2019 on the accessibility requirements for products and services (OJ L 151, 7.6.2019, p. 70).

integration into the 5G network, to be adequately funded.

INFORMATION ON ADOPTION IN COMMITTEE ASKED FOR OPINION

Date adopted	14.7.2020
Result of final vote	+: 49 –: 0 0: 0
Members present for the final vote	Magdalena Adamowicz, Andris Ameriks, José Ramón Bauzá Díaz, Izaskun Bilbao Barandica, Marco Campomenosi, Ciarán Cuffe, Jakop G. Dalunde, Johan Danielsson, Andor Deli, Karima Delli, Anna Deparnay-Grunenberg, Ismail Ertug, Gheorghe Falcă, Giuseppe Ferrandino, Mario Furore, Søren Gade, Isabel García Muñoz, Jens Gieseke, Elsi Katainen, Kateřina Konečná, Elena Kountoura, Julie Lechanteux, Bogusław Liberadzki, Benoît Lutgen, Elżbieta Katarzyna Łukacijewska, Marian-Jean Marinescu, Tilly Metz, Giuseppe Milazzo, Cláudia Monteiro de Aguiar, Caroline Nagtegaal, Jan-Christoph Oetjen, Philippe Olivier, Rovana Plumb, Dominique Riquet, Dorien Rookmaker, Massimiliano Salini, Barbara Thaler, István Ujhelyi, Elissavet Vozemberg-Vrionidi, Lucia Vuolo, Roberts Zīle, Kosma Złotowski
Substitutes present for the final vote	Leila Chaibi, Angel Dzhambazki, Markus Ferber, Carlo Fidanza, Maria Grapini, Roman Haider, Alessandra Moretti

FINAL VOTE BY ROLL CALL IN COMMITTEE ASKED FOR OPINION

49	+
ECR Group	Angel Dzhambazki, Carlo Fidanza, Roberts Zīle, Kosma Złotowski
GUE/NGL Group	Leila Chaibi, Kateřina Konečná, Elena Kountoura
ID Group	Marco Campomenosi, Roman Haider, Julie Lechanteux, Philippe Olivier, Lucia Vuolo
NI	Dorien Rookmaker, Mario Furore,
PPE Group	Magdalena Adamowicz, Andor Deli, Gheorghe Falcă, Markus Ferber, Jens Gieseke, Benoît Lutgen, Marian-Jean Marinescu, Giuseppe Milazzo, Cláudia Monteiro de Aguiar, Massimiliano Salini, Barbara Thaler, Elissavet Vozemberg-Vrionidi, Elżbieta Katarzyna Łukacijewska
Renew Group	José Ramón Bauzá Díaz, Izaskun Bilbao Barandica, Søren Gade, Elsi Katainen, Caroline Nagtegaal, Jan-Christoph Oetjen, Dominique Riquet
S&D Group	Andris Ameriks, Johan Danielsson, Ismail Ertug, Giuseppe Ferrandino, Isabel García Muñoz, Maria Grapini, Bogusław Liberadzki, Alessandra Moretti, Rovana Plumb, István Ujhelyi
Verts/ALE Group	Ciarán Cuffe, Jakop G. Dalunde, Karima Delli, Anna Deparnay-Grunenberg, Tilly Metz

0	-

0	0

Key to symbols:
+ : in favour
- : against
0 : abstention

22.9.2020

OPINION OF THE COMMITTEE ON CIVIL LIBERTIES, JUSTICE AND HOME AFFAIRS

for the Committee on Legal Affairs

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

Rapporteur for opinion (*): Assita Kanko

(*) Associated committee – Rule 57 of the Rules of Procedure

(Initiative – Rule 47 of the Rules of Procedure)

SUGGESTIONS

The Committee on Civil Liberties, Justice and Home Affairs calls on the Committee on Legal Affairs, as the committee responsible, to incorporate the following suggestions into its motion for a resolution:

– having regard to Articles 2 and 3 of the Treaty on European Union (TEU),

– having regard to Articles 10, 19, 21 and 167 of the Treaty on the Functioning of the European Union (TFEU),

– having regard to the right to petition enshrined in Articles 20 and 227 of the TFEU and Article 44 of the Charter of Fundamental Rights of the European Union (EUCFR),

– having regard to Articles 21 and 22 of the EUCFR,

– having regard to the preamble to the TEU,

– having regard to the Council of Europe's Framework Convention for the Protection of National Minorities, Protocol No 12 to the Convention for the Protection of Human Rights and Fundamental Freedoms, and the European Charter for Regional or Minority Languages,

– having regard to Council Directive 2000/43/EC of 29 June 2000 implementing the principle of equal treatment between persons irrespective of racial or ethnic origin[1]

[1] OJ L 180, 19.7.2000, p. 22.

(Racial Equality Directive),

– having regard to Council Directive 2000/78/EC of 27 November 2000 establishing a general framework for equal treatment in employment and occupation[2] (Equal Treatment in Employment Directive),

– having regard to 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)[3] (GDPR), and to Directive (EU) 2016/680 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 by competent authorities for the purposes of the prevention, investigation, detection or prosecution of criminal offences or the execution of criminal penalties, and on the free movement of such data, and repealing Council Framework Decision 2008/977/JHA[4],

– 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 11 December 2019 on The European Green Deal,

– having regard to its resolution of 16 February 2017 with recommendations to the Commission on Civil Law Rules on Robotics[5],

– having regard to the OECD Council Recommendation on Artificial Intelligence adopted on 22 May 2019,

A. whereas the development and design of so-called ‘artificial intelligence’, robotics and related technologies is done by humans, and their choices determine the potential of technology to benefit society;

B. whereas algorithmic accountability should mean implementing technical and operational measures that ensure transparency, clearly assigned chains of responsibility, non-discrimination through automated decision-making or through calculating of probabilities of individual behaviour; whereas transparency should give individuals meaningful information about the logic involved, the significance and the envisaged consequences; whereas this should include information about the data used for training AI and allow individuals to understand and monitor the decisions affecting them;

C. whereas there are serious concerns that the current EU legal framework, including the consumer law acquis, product safety and market surveillance legislation, as well as antidiscrimination legislation is not always fit for purpose to effectively tackle the risks created by artificial intelligence, robotics and related technologies;

D. whereas artificial intelligence, robotics and related technologies can have serious implications for material and immaterial goods of individuals, groups, and society as a whole, and these individual and collective harms must be reflected in legislative

[2] OJ L 303, 2.12.2000, p. 16.
[3] OJ L 119, 4.5.2016, p. 1.
[4] OJ L 119, 4.5.2016, p. 89.
[5] OJ C 252, 18.7.2018, p. 239

responses;

E. whereas governance issues with the deployment of AI in the public sector must be duly considered in terms of its implications for democracy, especially democratic legitimacy, accountability, meaningful public engagement and oversight;

F. whereas data analysis and AI increasingly impact on the information made accessible to citizens; whereas such technologies, if misused, may endanger fundamental rights to information as well as media freedom and pluralism;

G. whereas ethical guidance, such as the principles adopted by the High-Level Expert Group on Artificial Intelligence, provides a good starting point but is not enough to ensure that businesses act fairly and guarantee the effective protection of individuals;

1. Stresses that the prospects and opportunities of artificial intelligence can only be fully tapped into by citizens, the public and private sectors, academia and the scientific community when public trust in these technologies is ensured by a strong enforcement of fundamental rights and compliance with current EU data protection law and legal certainty for all actors involved; stresses that the processing of personal data can only be done pursuant to any of the legal bases laid down in Article 6 of Regulation (EU) 2016/679; considers that it is crucial that transparency and the proper provision of information to the audiences concerned are key to building public trust and to the protection of individual rights;

2. Underlines that compliance with the existing data protection legislation, together with strong scientific, ethical and legal standards, and methods for democratic oversight, are key to establishing trust in, and the reliability of, AI solutions; further emphasises that information revealed by AI does not offer an impartial overview of any subject matter and is only as reliable as the underlying data permits; highlights that predictive analysis based on AI can only offer a statistical probability and therefore cannot always accurately predict individual behaviour; stresses, therefore, that strong scientific, ethical and legal standards are vital for managing data collection and judging the results of such AI analysis;

3. Believes that any framework of ethical principles for the development, deployment and use of AI, robotics and related technologies should fully respect the EU Charter of fundamental rights and thereby respect human dignity, autonomy and self-determination of the individual, prevent harm, promote fairness, inclusion and transparency, eliminate biases and discrimination, also of minority groups, and respect and comply with the principles of limiting the negative externalities of technology used, explainability of technologies, and the guarantee that the technologies are there to serve people and not replace or decide for them, with the ultimate aim of increasingly human well-being for everybody;

4. Highlights the asymmetry between those who employ AI technologies and those who interact and are subject to them; in this context, stresses that citizens' trust in AI can only be built on an "ethics-by-default and by design" framework which ensures that any AI put into operation fully respects and complies with the Charter of Fundamental Rights of the European Union, Union law and the Treaties; considers that this should be in line with the precautionary principle that guides EU legislation and should be at the heart of any framework for AI; calls, in this regard, for a clear and coherent governance

model that allows companies and innovators to further develop artificial intelligence, robotics and related technologies;

5. Calls on the European Union and on the Member States to promote public awareness of the risks and opportunities of the use of AI as an ethical requirement;

6. Considers that the current Union legal framework, in particular on protection and privacy and personal data, will need to fully apply to AI, robotics, and related technologies and to be reviewed and scrutinized on a regular basis and updated where necessary in order to effectively tackle the risks created by artificial intelligence, robotics and related technologies, and, in this regard, could benefit from being supplemented with robust guiding ethical principles; points out that, where it would be premature to adopt legal acts, a soft law framework should be used;

7. Expects the Commission to integrate a strong ethical framework into the forthcoming legislative proposal as a follow up to the White Paper on Artificial Intelligence, including on safety, liability, fundamental rights, which maximises the opportunities and minimises the risks of AI technologies; expects that the forthcoming legislative proposal will include policy solutions to the major recognised risks of Artificial Intelligence including, amongst others, on the ethical collection and use of Big Data, the issue of algorithmic transparency and algorithmic bias; calls on the Commission to develop criteria and indicators to label AI technology in order to stimulate transparency, explanability, and accountability and incentivise additional precautions by developers; stresses the need to invest in integrating non-technical disciplines attuned to social context in AI study and research;

8. Recalls that AI, depending on how it is developed, used and applied, has the potential to create and reinforce biases, including through inherent biases in the underlying datasets, and therefore, create various forms of automated discrimination, including indirect discrimination, concerning in particular groups of people with similar characteristics; calls on the Commission and the Member States to take any possible measure to avoid such biases and to ensure the full protection of fundamental rights;

9. Notes that the field of AI, robotics and related technologies is strikingly homogenous and lacking in diversity; recognises the need to ensure that the teams that design, develop, test, maintain, deploy and procure these systems reflect the diversity of its uses and of society in general in order to ensure that bias is not unwittingly ‘built in’ to these technologies;

10. Is of the opinion that effective cross- border cooperation and ethical standards can be achieved only if all stakeholders commit to ensure human agency and oversight, technical robustness and safety, transparency and accountability, diversity, non-discrimination and fairness, societal and environmental well-being and respect the established principles of privacy, and data governance and data protection - specifically those enshrined in Regulation (EU) 2016/679 (GDPR);

11. Calls for a risk-based and future oriented approach to regulating artificial intelligence, robotics and related technologies, including technology-neutral standards across all sectors, with sector-specific standards where appropriate ; strongly believes that an EU-wide workable ethical framework should apply to anyone intending to develop or operate AI applications in the Union to avoid fragmentation; calls on the Union to

promote strong and transparent cooperation and knowledge-sharing between the public and private sectors to create best practice and to identify high-risk applications of AI;

12. Promotes Corporate Digital Responsibility on a voluntary basis; the Union should support corporations, who by choice use digital technologies and AI ethically within their companies; the Union should encourage corporations to become proactive by establishing a platform for companies to share their experiences with ethical digitalization, as well as coordinating the actions and strategies of participating companies;

13. Stresses that the protection of networks of interconnected AI and robotics is important and strong measures must be taken to prevent security breaches, data leaks, data poisoning, cyber-attacks and the misuse of personal data, and that this will require the relevant agencies, bodies and institutions both at European and national level to work together and in cooperation with end users of these technologies; calls on the Commission and Member States to ensure that Union values and respect for fundamental rights are observed at all times when developing and deploying AI technology in order to ensure the security and resilience of the EU's digital infrastructure;

14. Notes in this regard the provisions laid down in Regulation 2019/881 of the European Parliament and of the Council on ENISA and the Cyber Security Act, particularly ENISA's role in promoting public awareness and education campaigns directed at end users including on potential cyber threats and criminal activities online, and in promoting essential data protection measures; acknowledges the added value of this EU agency in this regard;

15. Stresses that the malicious use of AI can pose a risk to the values of our democracies and the fundamental rights of the citizens of the European Union. Calls on the Commission to propose a framework that penalises those who, using this technology, distort the perception of reality through disinformation campaigns, or who provoke cyber-attacks in order to violate digital cyber-security.

16. Notes that AI, robotics and related technologies in the area of law enforcement and border control could enhance public safety and security, but also need extensive and rigorous public scrutiny and the highest possible level of transparency both with regards to the risk assessment of individual applications, as well as a general overview of their use of AI, robotics and related technologies in the area of law enforcement and border control; considers that these technologies bear significant ethical risks that must be adequately addressed, considering the possible adverse effects on individuals when it comes, in particular to their rights to privacy, data protection and non-discrimination; stresses that their misuse can become a direct threat to democracy and that their deployment and use must respect the principles of proportionality and necessity, the Charter of Fundamental Rights, as well as the relevant secondary Union law such as EU data protection rules; Stresses that AI should never replace humans in issuing judgments; decisions, such as getting bail or probation, being heard in court, or decisions based solely on automated processing, producing a legal effect concerning individuals or which significantly affect them, must always involve meaningful assessment and the judgement of a human;

17. Warns that, owing to the intrusiveness of the decisions and measures taken by law enforcement authorities – including by means of data processing and AI – into the lives and rights of citizens, maximum caution is required in order to prevent unlawful discrimination and the targeting of certain individuals or groups of people defined by reference to race, colour, ethnic or social origin, genetic features, language, religion or belief, political or any other opinion, property, birth, disability, age, gender, gender expression or identity, sexual orientation, residence status, health or membership of a national minority which is often the subject of ethnic profiling or more intense law enforcement policing, as well as individuals who happen to be defined by particular characteristics; calls for proper training for the frontline collectors of data and users of intelligence derived from AI;

18. Points out that the possibility provided by these technologies of using personal and non-personal data to categorise and micro-target people, identify vulnerabilities of individuals, or exploit accurate predictive knowledge, has to be counterweighted by effectively enforced data protection and privacy principles such as data minimisation, the right to object to profiling and to control one's data, 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 strictly identified purpose; points out that while certain models of predictive policing are more privacy-friendly than others, such as where probabilistic predictions are made about places or events and not about individual persons, predictive policing systems have proven to exacerbate overpolicing on the basis of existing bias such as racial profiling, or on migrant or working class backgrounds even where this does not correspond to actual crime levels;

19. Stresses that citizens have the right to trust in the technology they use, and trust in the technology that is used by others; stresses that AI and robotics are not immune from making mistakes, and therefore emphasizes the importance of the right to an explanation when persons are subjected to algorithmic decision-making as well as the need for algorithms to be transparent, since transparency regarding the underlying logic of an algorithm is highly relevant for those who are affected, in order for their fundamental rights to be fully protected; considers the need for legislators to reflect upon the complex issue of liability, and that liability in all AI applications should always rest with a person, either natural or legal;

20. Underlines that artificial intelligence, robotics and related technologies are global technologies and that these standards need to be adopted worldwide in order to ensure their future development is aligned to Union values and ethical standards; calls on the Commission to engage in AI diplomacy in international fora with likeminded partners such as the United States, the G7, the G20, and OECD for establishing common ethical standards and guidelines for developing AI, robotics, and related technologies;

21 Stresses that a clear framework needs to be introduced for the use of AI by social media platforms, as do transparency requirements for the algorithms used and the calibration thereof, in order to prevent excessive content-removal and any form of filtering or censorship of the internet;

22 Notes that AI can be used to manipulate face- and audiovisual characteristics, often referred to as deepfakes; recalls that this technique can be used to manipulate elections, to disseminate disinformation and for other undesirable actions; asks the Commission

therefore to use its ethical framework to impose an obligation for all deepfake material or any other realistically made synthetic videos, to state it's not original and to introduce a strict limitation when used for electoral purposes;

23. Suggests to create a centre of expertise, bringing together academia, research, industry, and individual experts at Union level, either as an integral part of or associated with such Agency, to foster exchange of knowledge and technical expertise, and to facilitate collaboration throughout the EU and beyond;

24. Recalls the importance of linguistic and cultural diversity; calls therefore on the Commission to use its ethical framework to not let AI reduce this diversity, but to keep offer access to a wide variety of content which would not over-represent a single language and/or cultural model and to condemn any attempts from algorithms which would restrict this diversity and only offer content corresponding to some already existing patterns or which could act as an 'echo-chamber' that would prevent access to more diversity;

25. Recommends that the Commission demonstrates that it has clearly reviewed, assessed and adjusted its coordinated plan on AI in order to address the severe fundamental rights implications of AI, and outline how such risks will be mitigated in the EU's legislative approach and in the implementation of Member State national strategies;

INFORMATION ON ADOPTION IN COMMITTEE ASKED FOR OPINION

Date adopted	22.9.2020
Result of final vote	+: 55 –: 5 0: 7
Members present for the final vote	Magdalena Adamowicz, Malik Azmani, Katarina Barley, Pernando Barrena Arza, Pietro Bartolo, Nicolas Bay, Vladimír Bilčík, Vasile Blaga, Ioan-Rareş Bogdan, Patrick Breyer, Saskia Bricmont, Joachim Stanisław Brudziński, Jorge Buxadé Villalba, Damien Carême, Anna Júlia Donáth, Lena Düpont, Cornelia Ernst, Laura Ferrara, Nicolaus Fest, Jean-Paul Garraud, Maria Grapini, Sylvie Guillaume, Andrzej Halicki, Balázs Hidvéghi, Evin Incir, Sophia in ‘t Veld, Patryk Jaki, Lívia Járóka, Marina Kaljurand, Assita Kanko, Fabienne Keller, Peter Kofod, Moritz Körner, Alice Kuhnke, Jeroen Lenaers, Juan Fernando López Aguilar, Nuno Melo, Roberta Metsola, Nadine Morano, Javier Moreno Sánchez, Maite Pagazaurtundúa, Nicola Procaccini, Paulo Rangel, Diana Riba i Giner, Ralf Seekatz, Michal Šimečka, Birgit Sippel, Sylwia Spurek, Tineke Strik, Ramona Strugariu, Annalisa Tardino, Tomas Tobé, Dragoş Tudorache, Milan Uhrík, Tom Vandendriessche, Bettina Vollath, Jadwiga Wiśniewska, Elena Yoncheva
Substitutes present for the final vote	Delara Burkhardt, Gwendoline Delbos-Corfield, Kostas Papadakis, Kris Peeters, Anne-Sophie Pelletier, Sira Rego, Rob Rooken, Paul Tang, Tomáš Zdechovský
Substitutes under Rule 209(7) present for the final vote	Isabel Benjumea Benjumea

FINAL VOTE BY ROLL CALL IN COMMITTEE ASKED FOR OPINION

55	+
EPP	Magdalena Adamowicz, Isabel Benjumea Benjumea, Vladimír Bilčík, Vasile Blaga, Ioan-Rareş Bogdan, Lena Düpont, Andrzej Halicki, Balázs Hidvéghi, Lívia Járóka, Jeroen Lenaers, Nuno Melo, Roberta Metsola, Nadine Morano, Kris Peeters, Paulo Rangel, Ralf Seekatz, Tomas Tobé, Tomáš Zdechovský
S&D	Katarina Barley, Pietro Bartolo, Delara Burkhardt, Maria Grapini, Sylvie Guillaume, Evin Incir, Marina Kaljurand, Juan Fernando López Aguilar, Javier Moreno Sánchez, Birgit Sippel, Sylwia Spurek, Paul Tang, Bettina Vollath, Elena Yoncheva
RENEW	Malik Azmani, Anna Júlia Donáth, Sophia In 'T Veld, Fabienne Keller, Moritz Körner, Maite Pagazaurtundúa, Michal Šimečka, Ramona Strugariu, Dragoş Tudorache
ID	Peter Kofod
GREENS/EFA	Patrick Breyer, Saskia Bricmont, Damien Carême, Gwendoline Delbos-Corfield, Alice Kuhnke, Diana Riba I Giner, Tineke Strik
ECR	Joachim Stanisław Brudziński, Jorge Buxadé Villalba, Assita Kanko, Nicola Procaccini, Jadwiga Wiśniewska
NI	Laura Ferrara

5	-
EUL/NGL	Pernando Barrena Arza, Cornelia Ernst, Anne-Sophie Pelletier, Sira Rego
NI	Kostas Papadakis

7	0
ID	Nicolas Bay, Nicolaus Fest, Jean-Paul Garraud, Annalisa Tardino, Tom Vandendriessche
ECR	Rob Rooken
NI	Milan Uhrík

Key to symbols:
+ : in favour
- : against
0 : abstention

7.9.2020

OPINION OF THE COMMITTEE ON EMPLOYMENT AND SOCIAL AFFAIRS

for the Committee on Legal Affairs

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

Rapporteur for opinion: Lina Gálvez Muñoz

(Initiative – Rule 47 of the Rules of Procedure)

SUGGESTIONS

The Committee on Employment and Social Affairs calls on the Committee on Legal Affairs, as the committee responsible, to incorporate the following suggestions into its motion for a resolution:

A. Whereas the application of Artificial Intelligence, robotics and related technologies (AI) in everyday life and in the workplace is constantly increasing, thereby significantly transforming current socio-economic structures; whereas AI should benefit citizens and society by improving the quality of life, creating new employment opportunities and improving the competitiveness of the Union; whereas AI is an essential part of the digital economy and has the potential to foster prosperity and facilitate the transition to a sustainable economy, if harnessed well;

B. Whereas AI refers to systems that display intelligent behaviour by analysing their environment and taking actions, with some degree of autonomy, to achieve specific goals; whereas AI-based systems can be purely software-based, acting in the virtual world, for example in the form of voice assistants, image analysis software, search engines, speech and face recognition systems, or they can be embedded in hardware devices, for example in the form of advanced robots, autonomous cars, drones or Internet of Things applications;[1]

C. Whereas AI constitutes a strategic priority the full potential of which can only be exploited if users and consumers are aware of the potential benefits and challenges it brings; whereas enterprises as well as workers and their representatives are often aware of neither AI applications nor of their underlying functions and data; whereas there are

[1] Commission Communication on Artificial Intelligence for Europe, COM(2018) 237 final

cases of AI applications in breach of existing regulations, such as data protection;

D. Whereas AI potentially offers economic and societal benefits as well as new opportunities for businesses and workers, while at the same time giving rise to a number of ethical, legal and employment related challenges; whereas the application of AI at the workplace can contribute to inclusive labour markets and impact occupational health and safety, while it can also be used to monitor, evaluate, predict and guide the performance of workers with direct and indirect consequences for their careers; whereas AI should have a positive impact on working conditions and be guided by respect for human rights as well as the fundamental rights and values of the Union; whereas AI should be human centric, enhance the well-being of people and society and contribute to a fair and just transition;

E. Whereas AI has a marked impact on the labour market[2]; whereas it can potentially replace workers performing repetitive activities, facilitate human-machine collaborative working systems, increase competitiveness and prosperity and create new job opportunities for qualified workers; whereas the employment landscape is rapidly evolving with an estimated 65% of today´s children expected to work in completely new types of job and there is a need for re-skilling and up-skilling of workers, in particular with regard to digital skills, to ensure no one is left behind and there is a sufficient supply of specialised labour[3];

F. Whereas according to CEDEFOP, about 43% of Union adult employees have experienced new technologies at work; whereas about seven in ten Union workers require at least moderate digital skills to do their job;[4] whereas on average, about one quarter of Union citizens have no or low-level digital skills; whereas the digital divide has specific socio-economic, gender, age, geographic and accessibility aspects, which must be addressed; whereas 42% of workers in companies that apply AI in their business processes believe that such activities lead to ethical issues, which must be addressed; whereas 28% of the employers believe that the application of AI has not developed at full scale because of a lack of ethical rules on this issue;[5]

G. Whereas the COVID-19 pandemic underlined the importance of digital solutions, including teleworking, as well as its technical and social implications; whereas there are no common provisions at Union level, as regards the application of AI at the workplace, which could lead to market distortions and competition disadvantages; whereas AI should be subject to an appropriate regulatory framework;

H. whereas the OECD has drawn up recommendations on AI[6];

I. whereas the Council of the European Union encourages the promotion of an ethical and human-centred approach with regard to AI[7];

J. whereas social partners at Union level concluded a framework agreement on

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[2] STOA, “The ethics of artificial intelligence: issues and initiatives” March 2020
[3] European Parliament, “Encouraging STEM Studies for the labour market” March 2015
[4] CEDEFOP, “European Skills and Jobs survey”
[5] Capgemini Research Institute, “Why addressing ethical questions in AI will benefit organisations”, July 2019
[6] OECD, “Recommendation of the Council on Artificial Intelligence”, 2019, https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0449
[7] Council of the European Union “Council Conclusions on Shaping Europe’s Digital future”, June 2020

digitalisation, which amongst others includes a chapter on “Artificial intelligence and guaranteeing the human in control principle”[8];

K. whereas some Member States have already established special bodies to monitor and assess the influence of AI at the workplace;

L. whereas efforts to tackle gender bias and inequality in the digital sector are insufficient; whereas the gender gap persists across all digital technology domains and especially with regard to AI, thereby solidifying a male-biased trajectory for the digital sector in the foreseeable future;

1. Highlights the need to thoroughly assess the opportunities and challenges presented by AI applications in private and public companies as well as in public administration in relation to jobs and workers, including their impact on work-life balance, organisation of work and workflows; considers it indispensable that social dialogue not be bypassed and workers and their representatives be consulted and receive sufficient information right from the start of the decision making process; underlines that the deployment of AI needs to be transparent and that AI systems at the workplace must respect the privacy and dignity of workers;

2. Points out that a comprehensive risk assessment should come before the development, deployment and implementation of AI systems, evaluating its impact on fundamental rights and working conditions, including in terms of occupational health and safety, as well as its social consequences; assessments should icover risks related to human decision-making and social discrimination, as well as the evaluation of occupational risks arising;

3. Points out that AI solutions have the potential to improve working conditions and the quality of life, including improved work-life balance and better accessibility for people with disabilities, to predict labour market development and to support human resource management in preventing human bias, yet they can also raise concerns as regards privacy and occupational health and safety, such as the right to disconnect, and lead to disproportionate and illegal surveillance and monitoring of workers, infringing their dignity and privacy, as well as discriminatory treatment, including in recruitment processes, due to biased algorithms, including gender or racially and ethnically biased algorithms[9] and algorithms to the detriment of vulnerable groups; is concerned, furthermore, that AI can undermine the freedom and autonomy of people and contribute to mental health problems of workers, such as burnout, “techno stress”, psychological overload and fatigue; stresses that AI solutions in the workplace must be transparent, fair and avoid any negative implications for the workers;

4. Underlines that competent authorities should have access to all information concerning the data used for training, statistical models and theoretical principles related to AI solutions as well as the empirical validity of their outcomes;

5. Considers that AI can help to better utilise the skills and competences of people with disabilities and that the application of AI in the workplace can contribute to inclusive

[8] European Social Partners Framework Agreement on Digitalisation, June 2020

[9] European Parliament: “Education and employment of women in science, technology and the digital economy, including AI and its influence on gender equality”, April 2020.

labour markets and higher employment rates for people with disabilities;

6. Stresses that new technological possibilities, such as AI, and the appreciation of work efficiency must not lead to unequal technologically enhanced capacities, and a dehumanised digital future; underlines that the ethics of innovation must follow a humanist approach;

7. Considers that it should be mandatory for users, including workers, and consumers to be informed when a system uses AI, particularly with regard to personalised products or services, and to receive meaningful information, in easily understandable and accessible form, on all ethical aspects of AI applications relevant to them, to take informed decisions; stresses the importance of understanding how algorithms process and value data and how this can be limited or stopped; highlights the need for competence development through training and education for workers and their representatives with regard to AI in the workplace to better understand the implications of AI solutions;

8. Stresses that applicants and workers must be duly informed in writing when AI is used in the course of recruitment procedures and other human resource decisions and how in this case a human review can be requested in order to have an automated decision reversed;

9. Stresses the need to ensure that productivity gains due to the development and use of AI and robotics do not only benefit company owners and shareholders, but also profit companies and the workforce, through better working and employment conditions, including wages, economic growth and development, and also serve society at large, especially where such gains come at the expense of jobs; calls on the Member States to carefully study the potential impact of AI on the labour market and social security systems and to develop strategies as to how to ensure long-term stability by reforming taxes and contributions as well as other measures in the event of smaller public revenues;

10. Underlines the importance of corporate investment in formal and informal training and life-long learning in order to support the just transition towards the digital economy; stresses in this context that companies deploying AI have the responsibility of providing adequate re-skilling and up-skilling for all employees concerned in order for them to learn how to use digital tools and to work with co-bots and other new technologies, thereby adapting to changing needs of the labour market and staying in employment;

11. Calls for the application of the precautionary principle with regard to new technologies based on AI; underlines the fundamental principle that humans must always be in control of machines and AI and that AI decision making must be accountable and contestable and where relevant reversible; stresses that safety and security standards for AI must be respected and highlights the importance of regular checks and controls in this regard to prevent erroneous AI output; recalls that liability with regard to the use of AI must be clearly defined, both in the event of occupational accidents and damage caused to third parties;

12. Underlines that AI has to be human-centric, transparent, safe and secure and must comply with fundamental rights and applicable laws and regulations, including the General Data Protection Regulation (GDPR), throughout the system’s entire life cycle, especially when it is deployed at the workplace; calls for the development of a robust

certification system, based on test procedures and guided by the precautionary principle, which would allow businesses to demonstrate that their AI products comply with fundamental rights and Union standards;

13. Recalls that the employment and social acquis of the Union fully applies to AI and calls on the Commission and the Member States to ensure proper enforcement and to address any potential legislative gaps; notes that the Union can become a global leader in promoting a socially responsible use of AI;

14. Stresses the importance of a common European approach with regard to the ethical aspects of AI; underlines, that any regulatory framework in this regard must be adequate and based on a comprehensive impact assessment in order to avoid hampering future innovation and job creation; calls in this context for a European regulatory framework regarding the ethical aspects of AI which is proportionate and has a special focus on the world of work, including workers' rights and working conditions; considers that special attention should be paid to new forms of work, such as gig and platform work, resulting from the application of new technologies in this context; considers that a legislative framework that has the aim of regulating telework conditions across the Union and ensure decent working and employment conditions in the digital economy must likewise take the impact of AI into account; calls on the Commission to consult with social partners, AI-developers, researchers and other stakeholders in this regard;

15. Underlines that AI and any related legislation must not in any way affect the exercise of fundamental rights as recognised in the Member States and at Union level, including the right or freedom to strike or to take other action covered by the specific industrial relations systems in Member States, in accordance with national law and/or practice, or affect the right to negotiate, to conclude and enforce collective agreements, or to take collective action in accordance with national law and/or practice;

16. Underlines that special attention must be paid to data collected at the workplace with the help of AI, in particular if it is used for human resources decisions; calls on social partners at company level to jointly analyse and monitor the deployment of AI; calls on the Commission and social partners to analyse the need for special provisions on data protection at the workplace in the context of AI; stresses that workers are the owners of their data, even after the end of an employment relationship;

17. Considers that the new Skills Agenda for Europe must address the challenges of adapting and acquiring qualifications and knowledge, in view of the ecological and digital transition, including ethical aspects of AI; underlines the need to make ethical aspects of AI and the development of skills for ethical purposes an integral part of any education and training curricula for developers and people working with AI; recalls that developers, programmers, decision-makers and companies dealing with AI must be aware of their ethical responsibility; considers it likewise important to ensure that end users and consumers are provided with comprehensive information and that there are regular exchanges between all relevant stakeholders in this regard;

18. Reiterates the importance of education and continuous learning to develop the qualifications necessary in the digital age and to tackle digital exclusion; calls on the Member States to invest in high quality, responsive and inclusive education, vocational training and life-long learning systems as well as re-skilling and up-skilling policies for

workers in sectors that are potentially severely affected by AI; highlights the need to provide the current and future workforce with the necessary literacy, numeracy and digital skills as well as competences in science, technology, engineering and mathematics (STEM) and cross-cutting soft skills, such as critical thinking, creativity and entrepreneurship; underlines that special attention must be paid to the inclusion of disadvantaged groups in this regard;

19. Underlines that AI must not reinforce gender inequalities and stereotypes by transforming analogue biases and prejudices into digital ones through algorithms;

20. Stresses the need to ensure that people from diverse backgrounds, including women, young people, people of colour and people with disabilities are included in the development, deployment and use of AI; recalls that AI-based technologies at the workplace must be accessible for all, based on the design for all principle;

21. Points out that access to AI solutions is closely linked to access to high speed internet and therefore broadband coverage should be a priority in order to avoid discrimination and unequal access to these technologies;

22. Notes that the opportunities of AI solutions rely on ‘Big Data’, with a need for a critical mass of data to train algorithms and refine results; welcomes in this regard the Commission’s proposal for the creation of a common data space in the Union to strengthen data exchange and support research in full respect of European data protection rules.

INFORMATION ON ADOPTION IN COMMITTEE ASKED FOR OPINION

Date adopted	7.9.2020
Result of final vote	+: 46 –: 6 0: 1
Members present for the final vote	Atidzhe Alieva-Veli, Abir Al-Sahlani, Marc Angel, Dominique Bilde, Gabriele Bischoff, Vilija Blinkevičiūtė, Andrea Bocskor, Milan Brglez, Sylvie Brunet, David Casa, Leila Chaibi, Margarita de la Pisa Carrión, Özlem Demirel, Klára Dobrev, Jarosław Duda, Estrella Durá Ferrandis, Lucia Ďuriš Nicholsonová, Rosa Estaràs Ferragut, Nicolaus Fest, Loucas Fourlas, Cindy Franssen, Heléne Fritzon, Elisabetta Gualmini, France Jamet, Agnes Jongerius, Radan Kanev, Ádám Kósa, Stelios Kympouropoulos, Katrin Langensiepen, Miriam Lexmann, Elena Lizzi, Radka Maxová, Kira Marie Peter-Hansen, Dragoş Pîslaru, Manuel Pizarro, Dennis Radtke, Elżbieta Rafalska, Guido Reil, Daniela Rondinelli, Mounir Satouri, Monica Semedo, Beata Szydło, Eugen Tomac, Romana Tomc, Yana Toom, Marie-Pierre Vedrenne, Nikolaj Villumsen, Marianne Vind, Maria Walsh, Stefania Zambelli, Tomáš Zdechovský
Substitutes present for the final vote	Lina Gálvez Muñoz, Eugenia Rodríguez Palop

FINAL VOTE BY ROLL CALL IN COMMITTEE ASKED FOR OPINION

46	+
ECR	Lucia Ďuriš Nicholsonová, Elżbieta Rafalska, Beata Szydło, Margarita de la Pisa Carrión
GUE/NGL	Leila Chaibi, Özlem Demirel, Eugenia Rodríguez Palop, Nikolaj Villumsen
NI	Daniela Rondinelli
PPE	Andrea Bocskor, David Casa, Jarosław Duda, Rosa Estaràs Ferragut, Loucas Fourlas, Cindy Franssen, Radan Kanev, Ádám Kósa, Stelios Kympouropoulos, Miriam Lexmann, Dennis Radtke, Eugen Tomac, Romana Tomc, Maria Walsh, Tomáš Zdechovský
Renew	Abir Al-Sahlani, Atidzhe Alieva-Veli, Sylvie Brunet, Dragoş Pîslaru, Monica Semedo, Yana Toom, Marie-Pierre Vedrenne
S&D	Marc Angel, Gabriele Bischoff, Vilija Blinkevičiūtė, Milan Brglez, Klára Dobrev, Estrella Durá Ferrandis, Heléne Fritzon, Lina Gálvez Muñoz, Elisabetta Gualmini, Agnes Jongerius, Manuel Pizarro, Marianne Vind
Verts/ALE	Katrin Langensiepen, Kira Marie Peter-Hansen, Mounir Satouri

6	-
ID	Dominique Bilde, Nicolaus Fest, France Jamet, Elena Lizzi, Guido Reil, Stefania Zambelli

1	0
Renew	Radka Maxová

Key to symbols:
+ : in favour
- : against
0 : abstention

16.9.2020

OPINION OF THE COMMITTEE ON THE ENVIRONMENT, PUBLIC HEALTH AND FOOD SAFETY

for the Committee on Legal Affairs

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

Rapporteur for opinion: Adam Jarubas (Initiative – Rule 47 of the Rules of Procedure)

SUGGESTIONS

The Committee on the Environment, Public Health and Food Safety calls on the Committee on Legal Affairs, as the committee responsible,

– to incorporate the following suggestions into its motion for a resolution:

A. Whereas the Union is founded on the values stated in Article 2 of the Treaty on European Union and in compliance with the precautionary principle stated in Article 191(2) of the Treaty on the Functioning of the European Union;

B. Whereas Article 16 TFEU states that everyone has the right to the protection of their personal data; whereas Article 22 of the Regulation (EU) 2016/679 of the European Parliament and of the Council [1]refers to the situation where data is only used by automated processing, and recognises the right of the data subject not to be subject to a decision based solely on automated processing;

C. Whereas the global competition for leadership in the development of artificial intelligence (AI), which will affect the source of ethical values and standards shaping the sector worldwide, is picking up pace and the European Union should set an example for the rest of the world with an appropriate regulatory framework to also prevent a potential race to the bottom regarding national regulations;

D. Whereas this global competition should not be separated from the ethical values and standards;

E. Whereas rapid advances in research and innovation have raised a number of important ethical, legal and social issues that affect the relationship between science and society;

[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).

whereas this research and innovation must comply with ethical principles, and relevant national, Union and international law, including the Charter of Fundamental Rights of the European Union and the European Convention for the Protection of Human Rights and Fundamental Freedoms, according to the provisions of the European Research Programmes;

F. Whereas the integration of big data and AI technologies into public health systems and other sectors must be accompanied by appropriate rules, standards and legislation that protect the fundamental rights of individuals and address these new ethical challenges;

G. Whereas there is currently a noticeable gap in terms of patents and investments in the Union in comparison to other parts of the world;

H. Whereas AI and other emerging digital solutions may benefit society in the areas of green transition, environment and biodiversity protection, increasing the efficiency of agriculture, waste management, the circular economy, mitigation and adaptation to climate change, greening of various industrial processes, energy and transport management and efficiency, water and air quality (e.g. smart grids and electro-mobility), risk management and earth observation, in which the Union's Copernicus programme is one of the best, among others;

I. Whereas AI can be applied to almost any field in medicine: biomedical research as, exemplified by the AI-discovered antibiotic Halicin or AI contributions to cancer prevention, earlier and more precise diagnosis and new therapies with methods such as predicative or genomic medicine, medical education, assisting caregivers, supporting elderly care, monitoring patient conditions, more efficient development of medicines, more targeted treatment, clinical decision-making, personalised medicine, psychiatric diagnosis and treatment, in revolutionising robotic prostheses and support systems, telemedicine, telesurgery and enhancing the overall efficiency and interoperability of the health systems;

J. Whereas digital progress requires appropriate training and preparation for health and administrative personnel to prevent a digital divide, while bearing in mind our ageing societies and potential challenges to healthcare systems;

K. Whereas there are serious ethical concerns about the autonomy of machines;

L. Whereas digital health should not dehumanise care and not diminish the doctor-patient relationship, but should provide doctors with assistance in diagnosing and/or treating patients more effectively;

M. Whereas AI technology will accelerate the digital transformation of industry and play an essential part in the success of the digital economy in an increasingly connected world;

N. Whereas the current Union legal framework and ethics guidelines have already dealt with some ethical challenges related to AI applications indicated in the Commission White Paper on Artificial Intelligence, e.g. risk-assessment processes in place for AI-based health solutions in the Single Market; whereas other areas are lagging behind ethical challenges that must be identified and mitigated, since AI has tremendous capacity to threaten patient preference, safety, and privacy; whereas the boundaries between the roles of medical and care professionals and machines in patient care need to be outlined, including the principle

of supervised robot autonomy, whereas education of both healthcare workers and patients is needed;

O. Whereas Union data protection rules should be adapted to take into account the increasing complexity and interconnectivity of care and medical robots that may handle highly sensitive personal information and health data and should be consistent with privacy by design as established by Regulation (EU) 2016/679 on data protection;

P. Whereas solutions which stress the need to include scientific research as the basis for development strategies by creating repositories of medical data (e.g. neurological and cardiological data) and sharing data from this research can produce tangible social benefits in the context of public safety and health;

Q. Whereas AI solutions may benefit society in the area of food safety, among others by reducing the use of pesticides, supporting precision farming or more broadly Farming 2.0, where the Union is among the leaders in AI applications (e.g. for automated machine adjustments for weather forecasting or disease identification) which will allow more effective production to be combined with higher environmental standards and better utilisation of resources, especially in areas where water resources are scarce and climate change has severe impacts, as it should be in line with the Green Deal priorities;

R. Whereas the scope of that framework should be adequate, proportionate and thoroughly assessed; whereas it should cover a wide range of technologies and their components, including algorithms, software and data used or produced by AI; whereas a targeted approach based on the concept of high risk is necessary to avoid hampering future innovations in delivering the benefits of AI applications e.g. in healthcare, environment protection and food quality to citizens;

S. Whereas it is essential to identify effective means of ensuring trustworthy digital technologies, making it possible to reap their benefits while protecting fundamental rights and encouraging the development of informal, open, tolerant and just societies; whereas this is particularly important in the case of hybrid human/artificial intelligence systems;

T. Whereas robotic machines blur the boundaries between human subjects and technological objects; whereas not only do they have implications for society that need to be ethically assessed, but they also challenge even the ethical frameworks on the basis of which they are to be assessed; whereas, as is pointed out in the report by the World Commission on the Ethics of Scientific Knowledge and Technology (COMEST), particular attention should be paid to the use of medical robots, nursing robots, care robots for the elderly and companion robots;

U. Whereas the use of social robots and companion robots is spreading rapidly within healthcare and, in particular, within elderly care; whereas care robots for the elderly and companion robots may take on a functional and emotional role; whereas those robots may have a role to play in reducing loneliness among older people, preventing behaviours associated with dementia, stimulating the cognitive activities of patients with a neurodegenerative disease or performing particular everyday tasks that are difficult for elderly persons to carry out; whereas companion robots may thus provoke feelings that are false, illusory and unreciprocated, deluding and infantilising older people;

V. Whereas companion robots may increasingly be used for sexual purposes; whereas the

use of sex robots that look like children or are programmed to be abused has particularly worrying ethical implications;

A legal and ethical framework for AI:

1. Stresses that the Union must undertake all necessary steps to guarantee that its ethical values, as expressed in the acquis, apply effectively to all AI areas within its territory and to promote its standards worldwide; emphasises in this regard that technological developments in AI must always be to the benefit of humankind;

2. Underlines that the Union must undertake all necessary steps to increase the trust of society in the development and implementation of AI, robotics and related technologies; in light of the significant impact that these technologies can have on citizens; calls on the Commission to follow the ethics guidelines on trustworthy AI and propose adequate measures to make sure that those technologies do not generate unfairly biased outputs for citizens;

3. Stresses that a law-based Union AI ecosystem of trust, whether regarding environmental protection, health or food safety applications, extended by the Union AI ethical framework, will reinforce legal certainty and predictability, encourage stakeholders' involvement, increase the volume of entrusted data and market up-take, allow for economies of scale and support an ecosystem of excellence in those sectors; is of the opinion that this will strengthen the Union AI sector's global competitiveness and the potential to promote Union values and standards;

4 Notes that, due to the fact that legal regulations respond better to current well-defined challenges and due to the rapid development of AI resulting in uncertainty as regards what lies ahead, a common, legally well-anchored, enforceable Union AI ethical framework will expand an ecosystem of trust for all stakeholders as defined in the Commission White Paper, in particular in environmental or public health protection, the creation of healthier environments, better healthcare resources and services or food safety applications, thus supporting the ecosystem of excellence in legal certainty and predictability, providing effective response to the challenges not yet defined among others in courtrooms, management meetings or scientific laboratories;

5. Notes that the definition of AI requires further work; therefore underlines the importance of a human-centric approach and of regular reviews on AI advances and on the ethical framework, in order to promote proactive regulation and to guarantee its applicability through time and new developments; underlines that there are many levels of risk that evolve over time, through the advancement of AI technologies; stresses the need for a proportionate legislative framework which should evolve in line with the speed of technological advancement; points out that the Copernicus programme can serve as a best practice in developing high quality large datasets as input in AI models;

6. Stresses the need for a regulatory framework stipulating the ethical principles to be applied to the design, development, implementation and functioning of this technology - from data access to strict outcome monitoring;

7. Underlines that a balanced approach to regulation must be found, first and foremost ensuring that our values are not compromised whilst avoiding the creation of unnecessary administrative burden, especially for SMEs and start-ups; highlights in this regard that

global competition in AI does not always follow the same ethical principles as the Union; highlights that AI and associated technologies should not be left only to 'light-touch' self-regulation; considers it essential that a proportionate and supportive Union legislative framework is required; points out that many third countries are working on their ethical frameworks and that there are multiple proposals at a global level; is aware that the main difficulty regarding ethical principles may lie in the application of such principles rather than in their existence;

8. Supports the view that the seven AI requirements identified in the Ethics Guidelines for Trustworthy AI of the High-Level Expert Group on AI constitute solid building blocks for a common Union AI ethical framework, with proper legal anchoring, addressing, among others, ethical aspects of AI applications in environment, health and food protection; calls for an improvement of the acquis on transparency, traceability and human oversight, which were indicated as areas in need of further improvement in the feedback given on the Guidelines by 350 organisations; furthermore, encourages the creation of the Union AI ethical framework in a spirit of openness to the works of other international partners that share Union values, e.g. UN, the Council of Europe with its 2019 "Guidelines on Artificial Intelligence and Data Protection"[2], European ethical charter on the use of artificial intelligence in judicial systems and the work of its legal research centre, the Ad Hoc Committee on Artificial Intelligence (CAHAI), the Principles on AI[3] signed by OECD members in May 2019, the G20 Ministerial Statement of 2019 on Trade and Digital Economy, the annex of which contains the principles for AI, and the IEEE Global Initiative on Ethics of Autonomous and Intelligent Systems[4];

9. Strongly supports the Commission in establishing a common Union AI ethical framework to counter the shortcomings caused by AI internal market fragmentation, including in research, innovation and expertise in environmental, public health, healthcare, and food safety applications, and to prevent AI double standards across Member States for AI developed in the Union and beyond, inter alia in areas such as consumer data management, protection and privacy in smart grids, waste management, equal access to services and technologies, patient-doctor relationship standards, data protection and privacy legislation, including their interplay with research activities and drug development, civil liability in AI-assisted public healthcare, civil liability regarding autonomous vehicles or machinery; notes that on a national level, Member States' legislation does not contain harmonised liability rules that are applicable to damage or injury that could result from digital and behavioural technologies; calls for proper legal anchoring and positioning of such a Union AI ethical framework;

10. Recalls, in this regard, that the resolution of the European Parliament of 16 February 2017 on Civil Law Rules on Robotics[5] asked the Commission to consider the designation of a European Agency for Artificial Intelligence to ensure among others a harmonised approach across the Union, to develop common criteria and an application process relating to the granting of a European certificate of ethical compliance, and to address the new opportunities and challenges, in particular those of a cross-border nature, arising from ongoing technological developments; asks the Commission to reflect whether existing Union bodies and institutions are sufficient for those tasks or a new body for Artificial

[2] [1]https://rm.coe.int/guidelines-on-artificial-intelligence-and-data-protection/168091f9d8
[3] [2]https://legalinstruments.oecd.org/api/print?ids=648(=en
[4] [3]https://ethicsinaction.ieee.org
[5] OJ C 252, 18.7.2018, p. 239.

Intelligence needs to be created;

11. Considers that for all AI applications, developed in the Union and outside of it, the same level of protection must be secured in the Union as is the case with all other technologies, including effective judicial redress for parties negatively affected by AI systems, whilst technological innovation needs to be allowed to continue to develop; considers furthermore that this AI risk area is crucial e.g. for the health services, transport involving autonomous vehicles and food safety; calls for a clear distribution of obligations, rights and liabilities among the economic operators involved in AI applications delivery, to attribute each obligation to the actor(s) who is (are) best placed to address any potential risks, whether this be the developer, the deployer, the producer, the distributor or importer, the service provider, or the professional or private user, and in this regard calls for adequate revision of relevant EU legislation, e.g. of the Product Liability Directive and for the harmonization of national legislation; supports the Commission position expressed in the White Paper that, due to the complexity of AI systems, securing an effective level of protection and redress may require adapting the burden of proof required by national rules on liability for damage caused by the operation of AI applications; is of the opinion that clarity as to legal liability in the AI sector will strengthen enforcement of Union ethical values embodied in its acquis, legal certainty and predictability, and social acceptance supporting the development of a Union AI ecosystem of excellence by pooling investors and increasing market uptake;

12. Highlights that many of the proposals by countries which are not members of the Union and by international organisations revolve around common principles or concepts for AI, those being: human-centredness, trustworthiness, respect for human autonomy, harm prevention, equity and "no one left behind" and explainability; is of the opinion that an international ethical framework around those principles would be highly desirable; is concerned about AI progress and innovations leading to social inequality if no action is taken; calls therefore on the Commission and Member States to take the necessary measures to leave no one behind in the transition to a digital Europe, and to guarantee a fair, affordable and equal access to these innovations especially in areas such as healthcare;

13. Recommends supplementing the Risk-Based Approach with an Algorithmic Impact Assessment drawing information for example from the Regulatory Impact Analysis (RIA), GDPR Risk Assessment Procedure, Human Rights Impact Assessment (HRIA) and making the results publicly viewable;

14. Welcomes the fact that the Risk-Based Approach methodology defined in the Commission White Paper of 19 February 2020[6] recognises healthcare, transport and energy as high-risk sectors by default, introducing listed AI requirements beyond existing Union rules in those sectors, unless the manner in which AI is used does not involve significant risk; stresses that the Union AI ethical framework should address especially the above-mentioned high-risk sectors;

15. Calls for clear, objective and transparent procedures at Union level for establishing a public catalogue of AI high-risk applications involving a periodic review and update mechanism; calls for consideration of putting the burden of proof in such procedures, for

[6] CommissionWhite Paper On Artificial Intelligence - A European approach to excellence and trust, COM(2020)0065

all AI applications in all domains, on the entity seeking to develop or deploy the AI system, in order to maintain the catalogue open for innovation and avoid ignoring the risk of classifying AI applications as being non-high risk;

16. Considers that there are risks of biases and discrimination in the development, deployment and use of high-risk artificial intelligence, robotics and related technologies, including the software, algorithms and data used or produced by such technologies; recalls that, in all circumstances, those technologies should respect human dignity and ensure equal treatment for all; considers that such possible biases could be addressed by setting rules on data processing and setting up appropriate safeguards against bias and discrimination based on social, economic, ethnic, racial, sexual, gender, disability or other factors; warns of potential misuse of AI diagnostic applications and calls for AI capability and motivational safeguards;

17 Welcomes the voluntary labelling initiative for non-high risk AI;

18. Recommends measures to encourage the involvement of all AI ethics stakeholders from the private sector, consumer groups and academia for the formulation of an ethical code tailored to technological, social and political developments;

19. Points out that, to take decisions, robots use algorithms which play the part of values and ethical frameworks, and that their introduction has significant ethical implications for healthcare and social relations; is particularly concerned about the use for paedophilic and sexual abuse purposes of companion robots; believes that ethical considerations should be taken into account in the design of robotics technologies; calls, in the development process for these machines, for a place to be granted to ethics, based on an approach such as value-sensitive design, particularly with regard to care robots for the elderly and companion robots; stresses that this approach should also be adjusted to take account of animal welfare;

20. Underlines that, in addition to clear regulatory requirements on accountability and liability, there is also a need to ensure algorithmic transparency, so that it is possible to track the moment when 'things went wrong' and allow for the timely intervention by experts; considers algorithmic transparency as crucial to prevent situations where medical decision-making is done in a 'black-box' environment; underlines that black-box algorithms that make inexplicable decisions are unacceptable in any sector but in a context where AI decision-making has an impact on life or death decisions, the consequences of algorithmic failure could be grave; calls on the Commission and Members States to open dialogue with key stakeholders from the fields of medicine, IT, mathematics, physics, medical data technology, clinical psychology, bioengineering and pharmaceutical to establish dialogue-building platforms and assess the impact on the doctor-patient relationship and the dehumanisation of medical care.

21. Calls for Union guiding initiatives promoting interpretable algorithms, eXplainable AI (xAI), symbolic reasoning AI, white box AI-testing technics, by showing that those technologies can be combined with deep neural networks and by showing its legal, ethical and often business advantages, and also promoting methods to determine risks connected with different technological options using among others the experience of the UK’s Information Commissioner's Office (ICO) and The Alan Turing Institute guidelines “Explaining decisions made with AI”, showing that even highly complex neural AI

systems can be interpreted sufficiently;

22. Calls for transparency, responsibility, auditability, predictability and accountability to be ensured, as citizens, patients and users should be informed when interacting with a system using artificial intelligence by clear and understandable explanations of the data used, of the functioning of the algorithm, of its purpose, of its outcomes, and of its potential dangers; underlines that transparency and explainability are essential to ensure trust in these technologies; considers that the explanation should be complemented by auditability and traceability as respecting such principles is a way of guaranteeing accountability; points out that AI applications can outperform humans at narrow specific tasks while failing in overview analysis; calls for human oversight, professional responsibility and system predictability with ability to override the AI system;

23. Considers that any natural or legal person should be able to seek redress for a decision issued by high-riskAI, robotics or related technology that is to his or her detriment and that any decision taken by AI should be subject to strict human verification and due process; suggests that safeguards related to the use of high-risk artificial intelligence, robotics and related technologies be introduced within the framework of public power decisions, including periodic assessment and possible review of the regulatory framework to keep up with technological development, suggests establishing binding guidelines on the methodology of the compliance assessment to be followed by the national supervisory authorities, and establishing non-binding guidelines addressed to the developers, the deployers and the users;

24. Welcomes a European strategy for data, addressing challenges ahead for the Union in this area that is key to AI progress, and seeking European opportunities for competitive advantage in new data economy, especially in the growing sector of decentralised, non-personal data coming from industry, business and the public sector and from devices at the edge of the network, which is expected to constitute 80% of 175 zettabytes in 2025 and reverse current proportions;

25. Calls for sufficient financing to be secured for the Union AI transformation; supports the ambitions laid out in the Commission White Paper to attract €200 billion of AI public and private investment in the next 10 years in the Union; welcomes the attention granted to deficits of AI ecosystems in less-developed regions and to the needs of SMEs and start-ups; calls on the Commission to identify public infrastructure deficits and facilitate AI funding in climate change mitigation and adaptation, renewable energies and health and to facilitate geographically balanced access to all AI funding, including for SMEs and start-ups; stresses that the new Union objectives must not diminish Union engagement in its standing priorities, like the CAP, Cohesion Policy, the Green Deal and the Next Generation EU COVID19 Recovery Plan;

26 Calls on the Commission to promote and fund the development of human-centric artificial intelligence, robotics and related technologies that address environment and climate challenges and that ensure equal access to and enjoyment of fundamental rights through the use of tax, green public procurement, or other incentives;

Carbon Footprint of AI:

27. Notes that in the digital package published on 19 February 2020 the Commission states that ICT today accounts for between 5% and 9% of global electricity consumption and

2% of CO2 emissions and that the volume of data transferred and stored will continue to grow exponentially in the years to come and solutions in this regard need to be found; notes further that the 2018 Joint Research Centre study “Artificial Intelligence/ A European Perspective” estimates that data centres and data transmission could account for 3 to 4% of all power consumption of the Union;

28. Welcomes the fact that the European digital strategy proposes green transformation measures for digital sectors;

29. Stresses that despite the current high carbon footprint of deep learning and AI themselves, those technologies can contribute to the reduction of the current environmental footprint of the ICT sector and the development of AI, robotics, automated decisions, machine learning; underlines that those and other properly regulated related technologies should be critical enablers for attaining the goals of the Green Deal, the UN Sustainable Development Goals and the Paris Agreement in many different sectors and should boost the impact of policies delivering environmental protection, e.g. for waste reduction and environmental degradation;

30. Calls on the Commission to carry out a study on the impact of AI technology’s carbon footprint and the positive and negative impacts of the transition to the use of AI technology by consumers;

31. Notes that, given the increasing development of AI applications, which require computational, storage and energy resources, the environmental impact of AI systems should be considered throughout their lifecycle;

Impact of AI on the health sector and patient rights:

32. Recognises the major role AI can play in health and emphasises that AI applications in health should always have the aim of maximising the opportunities they can bring, such as improving the health of individual patients as well as the performance of Member States’ public health systems, without lowering ethical standards and without threatening the privacy or safety of citizens;

33. Welcomes the Commission commitment expressed in the White Paper to examine safety and liability challenges that are distinctive to healthcare, e.g. AI systems providing specialized medical information to physicians or directly to the patient, AI systems performing medical tasks themselves directly on a patient; calls for corresponding examination of the other listed sectors that are by default high-risk ones;

34. Considers that in areas such as health, liability must ultimately lie with a natural or legal person; emphasises the need for traceable and publicly available training data for algorithms;

35. Calls on the Commission to initiate an open, transparent sectoral dialogue giving priority to healthcare in order to then present an action plan to facilitate the development, testing and introduction of AI in research and innovation and its wide application in public health services;

36. Warns against attempts to give machines some kind of 'personality', which might result in the removal of human liability in the event of treatment errors;

37. Strongly supports the creation of a European Health Data Space[7] proposed by the Commission which aims at promoting health-data exchange and at supporting research in full respect of data protection, including processing data with AI technology, and which strengthens and extends the use and re-use of health data; calls for the upscaling of cross-border exchange of health data, their link and use through secure, federated repositories, specific kinds of health information, such as European Health Records (EHRs), genomic information, and digital health images to facilitate Union-wide interoperable registers or databases in areas such as research, science and health sectors;

38. Emphasises that patients should know when and how they are interacting with a human professional and when they are not; insists that patients should have the freedom to decide about this interaction and should be offered an alternative of an equal standard;

39. Considers that, particularly in the health sector, mobile applications can help to monitor diseases and it is useful for robots to be present to support the work of doctors or healthcare assistants, with a view to improving diagnosis and treatment, while ensuring that medical practice and patient care practices are not dehumanised;

40. Calls for a Union standardised inter-operability of eHealth applications and the creation of common European data access for prescriptions, diagnosis and medical reports, simply accessible for all Union citizens and in all Member States;

41. Reiterates that opportunities and risks inherent to these technologies have a global dimension that requires a consistent harmonised approach at international level; calls on the Commission to work in bilateral and multilateral settings to advocate and ensure that there is ethical compliance;

42. Highlights the benefits of AI for disease prevention, treatment and control, exemplified by AI predicting the COVID19 epidemic before the WHO; urges the Commission to adequately equip ECDC with the legal framework and resources for gathering necessary anonymised real-time global health data independently in conjunction with the Member States, to among other things address issues revealed by the COVID19 pandemic;

43. Points out that the use of tracking and contact tracing technologies by public authorities during the COVID 19 pandemic and other potential health emergencies might conflict with data protection; recalls in this regard the Communication of the Commission of 17 April 2020 on the Guidance on Apps supporting the fight against the COVID 19 pandemic in relation to data protection[8] and the need for proportionality, limitation in time, alignment with Union values and respect of human dignity and fundamental rights;

44. Considers that AI and robotics can provide considerable improvements in the control of medical devices and facilitate the everyday work of health professionals; considers that for critical medical devices, there needs to be a back-up system in place to monitor and secure the functionality of the device in any possible situation of interference and that possible cyber threats in the control of such devices need to be taken into consideration and mitigated; stresses that apart from hackers and outside threats, cyber threats can also originate from human mistakes or system errors and that it is necessary to have adequate

[7] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions - A European strategy for data, COM(2020)0066
[8] OJ C 124I , 17.4.2020, p. 1.

back-up systems in place and operational; considers furthermore that the Union should create an AI backup development roadmap to address the possible issues of AI system controls making an error;

45. Points out that the safety standards laid down in the Regulation (EU) 2017/745 of the European Parliament and of the Council [9] may not be sufficient for the challenges of AI systems; calls on the Commission to monitor the challenges in this field and to put forward proposals where necessary;

46. Emphasises the need to ensure that AI-driven medical devices should comply with the safety and performance requirements of the Regulation (EU) 2017/745; calls on the Commission and Member States to ensure that the Regulation (EU) 2017/745 is implemented as regards those technologies; considers new guidelines and specifications are required for the evaluation of the safety and effectiveness of software, AI and deep-learning powered devices throughout the entire usage cycle;

47. Calls for a clearer legal remit and sufficient financing to be secured for EMA and national competent authorities responsible for medicines in order to support innovation and public health aspects related to AI in the medicine lifecycle, in particular to collect and analyse real world health data that can generate additional evidence on medicinal products to support R&D and to optimise the safe and effective use of existing medicines in the interest of patients and of the European healthcare systems;

48. Insists that neither insurance companies nor any other type of service provider should be authorised to use e-health data to introduce discrimination in the setting of prices, given that this would run counter to the fundamental right to the highest attainable standard of health;

AI and data protection:

49. Welcomes the Commission's recently published review[10] of Regulation (EU) 2016/679, notes that Member State legislation follows different approaches when implementing derogations from the general prohibition for processing special categories of personal data, as regards the level of specification and safeguards, including for health purposes; states, therefore, that ultimately, humans should keep the responsibility for decision making, especially in sectors where there are high stakes and risks such as health;

50. Welcomes the Commission's intention to monitor the application of the Regulation (EU) 2016/679 to new technologies, including in possible future initiatives in the field of artificial intelligence and under the Data Strategy, and supports the Commission's call to the European Data Protection Board to issue guidelines on the application of the Regulation (EU) 2016/679 in the area of scientific research, AI, blockchain, and other possible technological developments;

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[9] Regulation (EU) 2017/745 of the European Parliament and of the Council of 5 April 2017 on medical devices, amending Directive 2001/83/EC, Regulation (EC) No 178/2002 and Regulation (EC) No 1223/2009 and repealing Council Directives 90/385/EEC and 93/42/EEC (OJ L 117 5.5.2017, p. 1)

[10] Communication from the Commission to the European Parliament and the Council on Data protection as a pillar of citizens' empowerment and the EU's approach to the digital transition - two years of application of the General Data Protection Regulation (COM(2020) 264 final)

51. Calls for citizen and patient empowerment regarding their personal data for securing the full enforcement and a uniform interpretation of the Union legal framework on data protection and privacy, especially in healthcare AI applications and other related sensitive data, to fully respect the “Right to be forgotten” provided for in Article 17 Regulation (EU) 2016/679 and to strengthen the “Right to an explanation” provided for in Article 22 Regulation (EU) 2016/679and higher interpretability requirements for high-risk AI;

52. Emphasises that the ethical framework on AI should include the right to obtain an explanation of a decision based on automated processing for persons that are the subject of such decisions;

53. Calls for the right balance to be struck between privacy and data protection and data utility; considers that it is important for scientific advancement to ensure that it is possible to share and process health data in sufficient depth and detail; calls for data anonymization to be ensured while avoiding excessive data minimization; calls for interoperable, suitable databases, registers and repositories at Union level to facilitate the use of health data in health, environment and food safety sectors;

54. Underlines the need to ensure that health data and data belonging to vulnerable groups are protected and points out that, to the extent that AI applications process health data on the basis of the data subject's consent, the conditions laid down in Article 7 Regulation (EU) 2016/679 have to be met;

55. Stresses that by no means, should the data generated contribute to any kind of discrimination; calls for guarantees that data collection and accessibility is always in line with the legal framework of the Union;

56. Points out that the risk of malicious data alterations and manipulation, and of possible hacking or data theft, can be particularly severe in the health sector and can be used to harm, discredit or profit from individuals; stresses that the highest cybersecurity standards should be established for the relevant networks;

AI impact on labour and social settings:

57. Points out that the OECD's ethical framework takes account of labour market upheaval; stresses that automation combined with AI will increase productivity and therefore increase output; points out that, as during previous technological revolutions, some jobs will be replaced; stresses that increased use of robotics and AI should also reduce human exposure to harmful and hazardous conditions and should also help to create more quality and decent jobs and improve productivity; points to the work of the OECD, which stresses that automation may give society the option to cut the number of hours worked, thus improving workers' living conditions and health;

58. Draws further attention to the OECD recommendations calling for governments to work closely with stakeholders to promote the responsible use of AI at work, to enhance the safety of workers and the quality of jobs, and to aim to ensure that the benefits of AI are broadly and fairly shared; underlines in this context that diverse teams of developers and engineers working alongside key actors can contribute to avoiding gender and cultural bias and ensuring that workers’ physical and mental well-being are respected in AI algorithms, systems and applications;

59. Stresses that the development of AI applications might bring down the costs and increase the volume of services available, e.g. health services, public transport, Farming 2.0, making them more affordable to a wider spectrum of society; stresses that AI applications may also result in the rise of unemployment, pressure on social care systems, and an increase of poverty; emphasises, in accordance with the values enshrined in Article 3 of the Treaty on European Union, the need to adapt Union AI transformation to socio-economic capacities, adequate social shielding, education and creation of alternative jobs; calls for the establishment of a Union AI Adjustment Fund building upon the experience of The European Globalisation Adjustment Fund (EGF) or the currently developed Just Transition Fund to be considered;

60. Stresses also the importance of social dialogue to accommodate a fair and inclusive transition for workers to new work realities affected by AI and the need for companies to invest in training and re-skilling of their workforce;

61. Calls for the Member States to align education for environment protection, health and food safety professionals to developments in AI, and to raise awareness of the risks and ethical challenges associated with AI;

62. Welcomes requirements proposed in the White Paper for high-risk AI training data, addressing as well safety – sufficiently broad data to cover all relevant scenarios in order to avoid dangerous situations as discrimination - sufficiently representative data to reflect well the social environment it will be applied to;

63. Stresses that the public sector should focus on solving social problems rather than generating AI uptake for its own sake; calls for the improvement of the public procurement regulations and guidelines of the Union, including Green Public Procurement of the European Union, so that during relevant evaluation procedures for tender offers, one takes into account whether a given issue requires an AI system application, and allows an alternative delivery path to be followed in cases where the evaluation indicates that such a non-AI solution addresses the social problem better;

INFORMATION ON ADOPTION IN COMMITTEE ASKED FOR OPINION

Date adopted	10.9.2020
Result of final vote	+: 77 –: 2 0: 2
Members present for the final vote	Nikos Androulakis, Bartosz Arłukowicz, Margrete Auken, Simona Baldassarre, Marek Paweł Balt, Traian Băsescu, Aurelia Beigneux, Monika Beňová, Sergio Berlato, Alexander Bernhuber, Malin Björk, Simona Bonafè, Delara Burkhardt, Pascal Canfin, Sara Cerdas, Mohammed Chahim, Tudor Ciuhodaru, Nathalie Colin-Oesterlé, Miriam Dalli, Esther de Lange, Christian Doleschal, Marco Dreosto, Bas Eickhout, Eleonora Evi, Agnès Evren, Fredrick Federley, Pietro Fiocchi, Andreas Glück, Catherine Griset, Jytte Guteland, Teuvo Hakkarainen, Martin Hojsík, Pär Holmgren, Jan Huitema, Yannick Jadot, Adam Jarubas, Petros Kokkalis, Athanasios Konstantinou, Ewa Kopacz, Joanna Kopcińska, Ryszard Antoni Legutko, Peter Liese, Sylvia Limmer, Javi López, César Luena, Fulvio Martusciello, Liudas Mažylis, Joëlle Mélin, Tilly Metz, Silvia Modig, Dolors Montserrat, Alessandra Moretti, Dan-Ştefan Motreanu, Ville Niinistö, Ljudmila Novak, Jutta Paulus, Stanislav Polčák, Jessica Polfjärd, Luisa Regimenti, Frédérique Ries, María Soraya Rodríguez Ramos, Sándor Rónai, Rob Rooken, Silvia Sardone, Christine Schneider, Günther Sidl, Ivan Vilibor Sinčić, Linea Søgaard-Lidell, Nicolae Ştefănuță, Nils Torvalds, Edina Tóth, Véronique Trillet-Lenoir, Alexandr Vondra, Mick Wallace, Pernille Weiss, Michal Wiezik, Tiemo Wölken, Anna Zalewska
Substitutes present for the final vote	Michael Bloss, Manuel Bompard, Christel Schaldemose

FINAL VOTE BY ROLL CALL IN COMMITTEE ASKED FOR OPINION

77	+
#PPE#	Bartosz Arłukowicz, Alexander Bernhuber, Traian Băsescu, Nathalie Colin-Oesterlé, Christian Doleschal, Agnès Evren, Adam Jarubas, Ewa Kopacz, Peter Liese, Fulvio Martusciello, Liudas Mažylis, Dolors Montserrat, Dan-Ştefan Motreanu, Ljudmila Novak, Jessica Polfjärd, Stanislav Polčák, Christine Schneider, Edina Tóth, Pernille Weiss, Michal Wiezik, Esther de Lange
S&D	Nikos Androulakis, Marek Paweł Balt, Monika Beňová, Simona Bonafè, Delara Burkhardt, Sara Cerdas, Mohammed Chahim, Tudor Ciuhodaru, Miriam Dalli, Jytte Guteland, César Luena, Javi López, Alessandra Moretti, Sándor Rónai, Christel Schaldemose, Günther Sidl, Tiemo Wölken
Renew	Pascal Canfin, Fredrick Federley, Andreas Glück, Martin Hojsík, Jan Huitema, Frédérique Ries, María Soraya Rodríguez Ramos, Linea Søgaard-Lidell, Nils Torvalds, Véronique Trillet-Lenoir, Nicolae Ştefănuţă
ID	Simona Baldassarre, Aurelia Beigneux, Marco Dreosto, Catherine Griset, Joëlle Mélin, Luisa Regimenti, Silvia Sardone
Verts/ALE	Margrete Auken, Michael Bloss, Bas Eickhout, Pär Holmgren, Yannick Jadot, Tilly Metz, Ville Niinistö, Jutta Paulus
ECR	Sergio Berlato, Pietro Fiocchi, Joanna Kopcińska, Ryszard Antoni Legutko, Alexandr Vondra, Anna Zalewska
GUE/NGL	Malin Björk, Manuel Bompard, Petros Kokkalis, Silvia Modig, Mick Wallace
NI	Eleonora Evi, Athanasios Konstantinou

2	-
ID	Sylvia Limmer
ECR	Rob Rooken

2	0
ID	Teuvo Hakkarainen
NI	Ivan Vilibor Sinčić

Key to symbols:
+ : in favour
- : against
0 : abstention

3.9.2020

OPINION OF THE COMMITTEE ON CULTURE AND EDUCATION

for the Committee on Legal Affairs

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

Rapporteur for opinion: Łukasz Kohut

(Initiative – Rule 47 of the Rules of Procedure)

SUGGESTIONS

The Committee on Culture and Education calls on the Committee on Legal Affairs, as the committee responsible:

- to incorporate the following suggestions into its motion for a resolution:

1. Recalls that the development, the deployment and the use of artificial intelligence (AI) in the cultural and creative sectors, and in the areas of education, media, youth, and information policy, not only has the potential to raise but also raises and will continue to raise a wide range of ethical issues that need to be addressed; stresses that the Union should lead the way towards ethical AI anchored in Union values, ensuring the protection of human dignity, and fundamental rights within a democratic, fair and sustainable Union; calls on the EU institutions to engage in long-term thinking about the impact of AI on our democratic debates, our societies and on the very nature of human beings, in order to be able to pave the way for AI technology that respects our freedom and does not disrupt innovation or curtail freedom of expression;

2. Strongly believes that there is a need to examine how human rights frameworks and obligations can guide actions and policies relating to new and emerging digital technologies to guarantee their anthropocentric approach and the accessibility of their benefits to all; recognises the need to ensure that the development, the deployment and the use of AI is free of discrimination, profiling bias and that it mirrors all essential elements of society; recognises that AI and automation might have an effect on the globalised economy which might entrench existing inequalities;

3. Stresses the need to develop tailor-made criteria for the development, the deployment and the use of AI in education, media, youth, research, and the cultural and creative sectors, by developing benchmarks for and defining principles of ethically responsible and accepted uses of AI technologies in these areas, including a clear liability regime

for products resulting from AI use; underlines that such criteria must be adaptable and constantly adjusted to the progress in AI technologies so as to also responsibly help harness the full potential of AI; highlights in particular the need to address personal user data collection and privacy concerns as well as liability issues in cases where automated processes lead to undesirable outcomes; recalls that, to provide for such criteria with a sound basis, it is necessary to require that the principles of conformity of a system with its specifications, transparency, good faith and equity be observed, in consultation with the competent ethics committees responsible for helping to lay the groundwork in line with European Union cultural values and legal framework provisions; notes that AI systems are software-based displaying intelligent behaviour based on the analysis of their environment; stresses that this analysis is based on statistical models of which errors form an inevitable part; underlines the need to ensure that systems and methods are in place to allow verification of the algorithm, explainability of the algorithm and access to remedies; highlights the need to ensure that there are binding rules ensuring that principles of transparency, accountability and non-discrimination are preserved; reiterates the 2019 Ethics Guidelines for Trustworthy AI and the seven key requirements for trustworthiness of AI;

4. Notes that every child enjoys the right to public quality education at all levels; therefore, calls for the development, the deployment and the use of quality AI systems that facilitate and provide quality educational tools for all at all levels and stresses that the deployment of new AI systems in schools should not lead to a wider digital gap being created in society;

5. Notices that AI personalised learning systems are increasingly being deployed in schools and universities, which is gradually changing the role of teachers in the learning process; stresses that this shift should be assessed thoroughly, reflected in curricula accordingly and be anchored by human-centric values; recognises the enormous potential contribution that AI and robotics can make to education; notes that AI personalised learning systems should not replace educational relationships involving teachers and that traditional forms of education should not be left behind, while at the same time pointing out that financial, technological and educational support, including specialised training in information and communications technology must be provided for teachers seeking to acquire appropriate skills so as to adapt to technological changes and not only harness the potential of AI but also understand its limitations;

6. Stresses that where machine learning is used in the procedures for selection of potential students, adequate safeguards must be implemented, including informing applicants of such procedures and their rights in this regard; notes that the relevant algorithms need to be trained on broad data sets in order to prevent the algorithms from unfairly discriminating against certain groups; is of the view that the relevant decisions taken with the help of automated processes need to be explainable, including, if necessary, to the rejected students;

7. Calls for an AI, robotics and related technologies strategy to be developed at Union level in order to help transform and update our educational systems, prepare our educational institutions at all levels and equip teachers and pupils with the necessary skills and abilities; considers that there is a necessity for a framework on ethics in education ; recommends the involvement of civil society, universities, trade unions and employers associations in the process of drafting such a framework ; notes that AI

systems developed, deployed and used in the Union need to reflect its cultural diversity and its multilingualism; stresses that special support that should be given to tech developers and beneficiaries from disadvantaged groups and persons with disabilities;

8. Considers that special attention and protection must be given to upholding the rights of minors, given the particular influence of education on their future, specifically the right to privacy and access to quality education, ensuring equal opportunities in every case; emphasises that educational institutions should only use AI systems for educational purposes that have been audited and certified as ethical, beneficial and acting consistently with human rights principles; calls on the Commission and the Member States to promote cooperation between the public and private sectors and academia in order to reinforce knowledge-sharing and open sources;

9. Notes that there is a need to clarify the concept of arts and cultural and creative works, as well as the role of humans as creators and artists; emphasises that opportunities provided by digitisation and new technologies must not lead to an overall loss of jobs in the cultural and creative sectors, to neglect the conservation of originals and to downplay traditional access to cultural heritage, which should equally be encouraged;

10. Acknowledges the growing potential of AI in the areas of information, media and online platforms, including as a powerful tool to fight disinformation; is concerned, however, about the potential for AI to be misused in order to manipulate public opinion online; underlines that, if not regulated, it might also have ethically adverse effects by exploiting bias in data and algorithms that may lead to disseminating disinformation, creating information bubbles and exploiting biases incorporated into AI algorithms; recalls that adequate education is a necessary condition to safeguard citizens' rights with regard to the freedom of information, opinion and expression, calls for the ethical use of AI technologies in the field of media; warns about the risks of technology-driven censorship and the need for an ethical framework to protect the freedom of speech;

11. Considers that the use of certain types of AI, such as facial recognition, emotion and behaviour detection systems, might have a damaging effect, notably on the role of media and journalists as watchdogs of democracy and thus on democratic processes; underlines therefore, that the use of those systems in public spaces should be restricted or banned whenever necessary; emphasises the need to continue the fight against fake news, including techniques such as "deepfakes", against censorship and automated surveillance;

12. Emphasises the need to raise awareness and understanding in the general public about the role and impact of AI through formal and non-formal education, including humanity studies, notably about the use of algorithms and their impact, inter alia, on jobs and privacy, the understanding of the place occupied by IT systems in selecting, interpreting, storing and representing data; advocates the establishment of digital literacy tools at all levels of education and thus calls on the Member States and on the EU institutions to invest in information and media literacy, education and training; considers that information and media competences are crucial for all citizens, including the vulnerable social groups, to be able to critically assess and understand new developments including an understanding of the functioning of AI and its inherent biases and thus, to develop new forms of critical thinking; recommends that the Commission promote AI-, robotics- and technology-related formats of education and

continuous education;

13. Notes the important distinction between transparency of algorithms and transparency of the use of algorithms; emphasises the importance of transparency and accountability of algorithms used by video-sharing platforms (VSP) as well as streaming platforms, in order to ensure access to culturally and linguistically diverse content and avoid privileging; believes that every user should be properly informed when an algorithm is used to recommend content, and should be able to optimise them according to his or her choices, and such algorithms should not restrict a user’s choice; considers that any user should also be able to disable content recommendation by AI; stresses that such algorithms should be designed in such a way that they reflect the cultural diversity of our societies ensuring genuine cultural openness and guaranteeing freedom of creation; insists that user data collected by AI, such as cultural preferences or educational performance, must not be transmitted or used without the owner's knowledge;

14. Notes that sport has always embraced technological innovation; considers, nevertheless, that the use of AI technologies, which is spreading rapidly into sports competitions, is increasingly raising questions of fair competition in sport whereby those teams with the most financial resources can acquire the best technology, thus potentially giving them an unfair advantage; emphasises that these developments have to be closely monitored and stresses that this area needs a regulatory framework which applies ethical and human-centric criteria in the development and use of AI technologies; calls for full transparency on the algorithms and technologies used in sports in order to level the playing field.

INFORMATION ON ADOPTION IN COMMITTEE ASKED FOR OPINION

Date adopted	31.8.2020
Result of final vote	+: 28 –: 0 0: 2
Members present for the final vote	Isabella Adinolfi, Christine Anderson, Ilana Cicurel, Gilbert Collard, Gianantonio Da Re, Laurence Farreng, Tomasz Frankowski, Romeo Franz, Hannes Heide, Irena Joveva, Petra Kammerevert, Niyazi Kizilyürek, Predrag Fred Matić, Dace Melbārde, Victor Negrescu, Peter Pollák, Marcos Ros Sempere, Andrey Slabakov, Massimiliano Smeriglio, Michaela Šojdrová, Sabine Verheyen, Salima Yenbou, Milan Zver
Substitutes present for the final vote	Isabel Benjumea Benjumea, Christian Ehler, Ibán García Del Blanco, Bernard Guetta, Marcel Kolaja, Elżbieta Kruk, Martina Michels

FINAL VOTE BY ROLL CALL IN COMMITTEE ASKED FOR OPINION

28	+
PPE	Isabel Benjumea Benjumea, Christian Ehler, Tomasz Frankowski, Peter Pollák, Michaela Šojdrová, Sabine Verheyen, Milan Zver
S&D	Ibán García del Blanco, Hannes Heide, Petra Kammerevert, Predrag Fred Matić, Victor Negrescu, Marcos Ros Sempere, Massimiliano Smeriglio
RENEW	Ilana Cicurel, Laurence Farreng, Bernard Guetta, Irena Joveva
ID	Gilbert Collard
VERTS/ALE	Romeo Franz, Marcel Kolaja, Salima Yenbou
ECR	Elżbieta Kruk, Dace Melbārde, Andrey Slabakov
GUE/NGL	Niyazi Kizilyürek, Martina Michels
NI	Isabella Adinolfi

0	-
-	-

2	0
ID	Christine Anderson, Gianantonio Da Re

Key to symbols:
+ : in favour
- : against
0 : abstention

INFORMATION ON ADOPTION IN COMMITTEE RESPONSIBLE

Date adopted	1.10.2020
Result of final vote	+: 20 –: 0 0: 4
Members present for the final vote	Manon Aubry, Gunnar Beck, Geoffroy Didier, Angel Dzhambazki, Ibán García Del Blanco, Jean-Paul Garraud, Esteban González Pons, Mislav Kolakušić, Gilles Lebreton, Karen Melchior, Jiří Pospíšil, Franco Roberti, Marcos Ros Sempere, Liesje Schreinemacher, Stéphane Séjourné, Raffaele Stancanelli, József Szájer, Marie Toussaint, Adrián Vázquez Lázara, Axel Voss, Tiemo Wölken, Javier Zarzalejos
Substitutes present for the final vote	Patrick Breyer, Evelyne Gebhardt

FINAL VOTE BY ROLL CALL IN COMMITTEE RESPONSIBLE

20	+
EPP	Geoffroy Didier, Esteban González Pons, Jiří Pospíšil, József Szájer, Axel Voss, Javier Zarzalejos
S&D	Ibán García Del Blanco, Evelyne Gebhardt, Franco Roberti, Marcos Ros Sempere, Tiemo Wölken
RENEW	Karen Melchior, Liesje Schreinemacher, Stéphane Séjourné, Adrián Vázquez Lázara
VERTS/ALE	Patrick Breyer, Marie Toussaint
ECR	Angel Dzhambazki, Raffaele Stancanelli
NI	Mislav Kolakušić

0	-

4	0
ID	Gunnar Beck, Jean Paul Garraud, Gilles Lebreton
GUE/NGL	Manon Aubry

Key to symbols:
+ : in favour
- : against
0 : abstention