Explainability-Based Artificial Intelligence Governance: A Legal Framework Analysis of Ethical and Social Impacts

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Abstract: Even though artificial intelligence (AI) systems, also known as "thinking machines," have become an indisputable aspect of technological advancement in society, it is impossible to ignore the moral dilemmas and societal effects they raise. These difficulties necessitate the introduction of legal regulations as well as the precise definition of AI's standing, obligations, limitations, and accessibility. Legislators and policymakers have therefore begun to assess AI advancements in the context of moral ideals and principles, particularly in reaction to particular applications that have sparked public outrage. With an emphasis on the lack of explainability in AI systems, this study examines these problems and draws attention to specific legal loopholes. Countries and international organizations are currently developing ethical standards for artificial intelligence. These guidelines are frequently disregarded, though, when developing software, defining developer accountability, and describing the decision-making process of AI. Therefore, to demonstrate how ethical and legal considerations can be incorporated into the technical architecture of AI systems, a governance framework centred on explainability, accountability, and ethical design is required.

1 INTRODUCTION

1.1 Artificial Intelligence

With the ultimate goal of enhancing human life, artificial intelligence (AI) is a technology that can complete complicated tasks faster and more effectively than humans. The advancement of AI has primarily been driven by the desire to benefit humanity. AI tools have become increasingly popular since the advent of large language models like ChatGPT and Google Bard. These days, digital tools that produce text, images, audio, and video are frequently thought of when AI is mentioned. Over the past 20 years, the applications of AI have rapidly expanded into almost every field, despite the fact that its full scope is still not fully understood(Kurtuluş, 2023).

Numerous industries, including healthcare, manufacturing, transportation, security, education, and social life, are now utilizing AI applications, which have significantly changed the world. In the upcoming years, their range of applications is anticipated to grow even more. AI algorithms raise significant ethical issues as they play a bigger and bigger part in the digitalized facets of human life and integrate into social structures(Yeşilkaya, 2022). Concern is growing throughout society over the possible drawbacks of AI in fields that require face-to-face communication(Ashraf, 2022). The most important applications of AI are the main focus of this study. Additionally, it emphasizes the significance of social and ethical oversight, highlighting the fact that the efficacy of legal regulations is influenced by both normative principles and the ways in which these principles are incorporated into technological systems.

Although many ethical principles have been proposed in recent years, their integration into the software development process, the clarification of developer responsibilities, and the explainability of AI decisions remain largely overlooked. Particularly in intricate, deep learning-based systems, this ambiguity breeds uncertainty and endangers people's rights.

The goal of this study's next phase is to suggest a governance framework based on accountability, explainability (XAI), and ethical-by-design

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methodologies. This framework aims to provide a comprehensive model that assigns responsibilities not only to developers but also to regulatory bodies, user communities, and ethics committees by combining technical elements and normative principles. By doing this, the study hopes to investigate how legal and ethical frameworks can be converted into technical architectures, especially when explainable AI and ethical-by-design approaches are used.

1.2 Explainable Artificial Intelligence

Making AI systems' decisions and outputs comprehensible and interpretable for humans is the goal of the research field known as Explainable Artificial Intelligence (XAI) (Adadi and Berrada, 2018). XAI is sometimes referred to as "AI for humans," with the goal of bridging the gap between human comprehension and machine intelligence by assisting users in understanding the reasoning behind decisions and their reliability(Angelov et al., 2021). These initiatives are mostly the result of growing concerns about the trustworthiness and transparency of AI. The need for new AI techniques that make AI decisions more understandable and explicable is being driven more and more by social, ethical, and legal pressures(Adadi and Berrada, 2018).

1.3 Artificial Intelligence Ethics

The moral standards and guidelines that direct the conduct of individuals or groups and aid in determining what is right and good are referred to as ethics. According to this definition, AI ethics are the rules and values that influence how AI systems behave(Turan et al., 2022). Ethical AI highlights how crucial ethical factors are in determining what applications of AI are acceptable and unacceptable (Yeşilkaya, 2022).

2 SOCIAL AND ETHICAL PROBLEMS OF ARTIFICIAL INTELLIGENCE

2.1 Ethical and Social Impacts in Application Areas

2.1.1 Ethical and Social Impacts in the Health Sector

AI is known to speed up diagnostic procedures by analysing data and recognizing images. It is important for drug development, robotic surgery, patient monitoring, and early disease detection. Due to benefits like three-dimensional imaging, the removal of hand tremors, better access to organs, tissues, and nerves, and the ability to provide surgeons with an ergonomic range of motion, robots are becoming more and more popular in surgical procedures for a variety of diseases(Walters and Eley, 2011). It is clear that AI offers humanity enormous advantages and conveniences due to its creativity, speed, and performance in healthcare. Nonetheless, healthcare providers now have continuous access to patient records thanks to advancements in electronic record systems. This circumstance highlights the need for legal regulations to protect patient data within healthcare automation and presents ethical questions regarding patient privacy and confidentiality(Özdemir and Bilgin, 2021). In this case, deciding who will be responsible for any problems resulting from AI-performed diagnoses or surgical procedures and how to handle the fallout are the most important ethical and social issues. "AI systems should only assist clinical decision-making processes, with ultimate responsibility resting on physicians as part of their clinical duties," the World Health Organization (WHO) emphasizes in its six basic principles regarding responsibilities in AI applications. Making wise clinical decisions and guaranteeing patient safety depend heavily on this strategy"(World Health Organisation, 2024).

2.1.2 Ethical and Social Impacts of Autonomous Vehicles

The creation of autonomous vehicles is among the most noteworthy developments in artificial intelligence. These cars use onboard cameras and sensors to sense their environment and navigate on their own. This feature is an obvious illustration of AI's potential to improve comfort and benefit society since it allows independent mobility for the elderly, disabled, and those who are unable to drive. There are many other benefits as well. However, in addition to the advantages for society, the use of autonomous vehicles also brings up moral and security issues. For example, who is responsible for an accident—the consumer, the developer, or the manufacturer? This problem was attempted to be resolved by researchers at the Technical University of Munich in their paper "An Ethical Trajectory Planning Algorithm for Autonomous Vehicles." Maximilian Geisslinger, one of the authors, clarified: "Up until now, autonomous vehicles (AVs) have always had to make a moral decision. But traffic conditions in the real world are

rarely straightforward. Our algorithm makes an ethical choice in a matter of seconds after weighing thousands of potential courses of action and evaluating various risks (Geisslinger et al., 2023). This problem is especially significant because, in a recent instance, Mercedes-Benz used an algorithm created for its autonomous cars that put the safety of its passengers before that of other people. This strategy presents a significant ethical question regarding how other drivers' and pedestrians' safety is taken into account in emergency situations.

2.1.3 Ethical and Social Impacts of Recruitment Processes

Recruitment procedures are another area where AI's ethical limitations are especially noticeable. AI can improve the effectiveness of planning, hiring, and candidate evaluation, allowing businesses to make decisions more swiftly and efficiently. But there are also serious moral and societal repercussions to this. Although AI may at first appear to help employers make decisions more quickly, there are worries that discrimination may result from biased data used in hiring criteria. Specifically, candidates may be unfairly disadvantaged by AI systems on the basis of personality traits, gender, or race(Chen, 2023). Historical data is used to train AI algorithms. The AI may use patterns learned from previous hiring practices to unjustly exclude some candidates from the selection process if this data contains demographic biases or if people with disabilities are not like the majority. This could compromise diversity.

2.2 Ethical and Social Impacts in the Field of Personal Rights and Freedoms

2.2.1 Data Privacy and Security

As sophisticated data discovery methods have become more prevalent, privacy has become a significant social issue. Individuals can now be easily identified, profiled, and influenced without their knowledge or consent. These processes are speeding up as AI systems develop, which raises more privacy concerns(Eryılmaz, 2023).

2.2.2 Discrimination and Prejudices

The datasets used for training have a significant impact on how ethical and social values are integrated into AI systems. AI systems will pick up on and reinforce human biases if they are present in these datasets. In particular, biases may be strengthened if training data contains discriminatory information about particular groups, religions, or physical characteristics. Religious beliefs are a significant issue that could result in prejudice and discrimination in AI algorithms, their outputs, and the broader legal frameworks. It has long been known that human beliefs have influenced societies since the beginning of time, and people have structured their lives around these beliefs(Demir, 2024).

2.2.3 Trust and Transparency in Human-Machine Interaction

One of the key issues discussed within AI ethics is the ethical coding of robots designed for critical missions, such as robot police and robot soldiers. Otherwise, robot systems with military functions could lead to serious ethical violations(Karabağ, 2021).

2.2.4 Working Life and Unemployment Risk

There is a need for political and legal regulations that will minimize the unemployment problem that will arise from discrimination and technology, and to experience the negative effects of unemployment in a more reasonable way(Doruköz and Uslu, 2023). The material and moral devastation that people would experience due to the fear of unemployment during the rapid transitions prior to these policies could lead to unrest and anxiety within society. A study conducted in both developed and developing countries found a non-linear relationship between AI and unemployment, depending on the inflation threshold. In other words, AI increases unemployment until a certain inflation threshold is reached, after which its impact diminishes.”(Nguyen and Vo, 2022). Of course, this process still hasn't prevented unemployment in some sectors, and this has negatively impacted people's perspective on technological advancements. This continues to be a social problem

3 LEGAL REGULATIONS

3.1 Current Legal Gaps and Risks

The rapid development of AI technologies has created a situation where existing legal frameworks are inadequate to adapt to these innovations(Kara Kiliçarslan, 2019). Due to developing technology and

new situations, different communities and beliefs, and lifestyles, common and appropriate legal decisions cannot be made for every situation. This situation has created some legal gaps and risks.

Views on the legal status of AI are gathered around the issue of whether AI should be positioned as an object, thing or product, or as a non-human subject. The view that evaluates AI as an object argues that the rights and responsibilities of AI can develop in a very limited way and that this can be regulated by an insurance system."(Perennou, 2019).

While it is obvious that AI is coded by humans, the first idea that makes sense is that it is considered as a thing. For this reason, it is the most reasonable legally to see it as a thing. It should be accepted that insurance companies can be intermediaries in allocating the damages that AI may cause, therefore it cannot be a subject of rights, but it should be accepted as an object that can be defined by ownership. (Akkurt, 2019).

The concept of electronic personhood was proposed in the Recommendation on Civil Law Rules on Robotics (27 January 2017) prepared by the European Parliament (EP) Committee on Legal Affairs, as a possible solution to some fundamental issues in the fields of robotics and law. The electronic person concept is considered more appropriate than the object concept when considering the autonomous characteristics of AI(Yenice, 2024).

While there is no clear consensus on its legal status yet, it is still unclear who the law should punish and hold responsible in which areas and how. For example, if an autonomous vehicle causes an accident, how will it determine who will be responsible? Who will be responsible if a robotic device used in a surgery causes the death of a patient? In addition, the decision-making processes of AI systems are referred to as a "black box"(Öztemel, 2012). The lack of transparency in these systems makes legal oversight and accountability difficult. This is because the term "Black Box" refers to the lack of transparency and accountability in the data used by AI and human observers, or in the decision-making processes. In other words, "Black Box" AI systems refer to AI systems that are primarily opaque neural networks, whose inputs and operations are invisible to neither the user nor other interested parties(MacCarthy, 2020). For this very reason, the XAI initiative demonstrates the ability to explain the decision-making processes underlying such large and complex systems in terms and formats understandable to experts in the field(Angelov et al., 2021).

4 INTERNATIONAL LEGAL APPROACHES

In order to find solutions to the ethical, social and security problems of AI systems, international organizations such as the OECD and the European Parliament have considered that a set of rules and frameworks should be determined and have included comprehensive regulations that will make AI more problem-free in terms of ethical and social effects and protect human life from negative effects(Güner, 2019).

The negative impacts of AI use on human rights have led to increased concerns in this area at national and international levels. Accordingly, in the "Guide to Ethical Principles for Trustworthy Artificial Intelligence Systems" published by the Council of Europe on December 18, 2018, which guides AI designs based on human rights, it is seen that various requirements aimed at addressing these concerns are addressed. These requirements are; "maintaining basic human rights, technical robustness and security, which are closely related to the principle of prevention of harm, and privacy (privacy of private life) and data management, which are closely related to the principle of explainability, transparency, which are closely related to the principle of fair treatment, diversity, non-discrimination and fairness, which are closely related to the principle of accountability and fair treatment, and ensuring social well-being and protecting the environment, which are closely related to the principle of prevention of harm."(Singil, 2022).

4.1 OECD AI Principles

The OECD Principles on Artificial Intelligence support AI to be innovative, trustworthy and ethical. These principles were adopted by OECD member countries on May 22, 2019, and are among the first global principles on AI to be signed by governments. Non-OECD countries such as Argentina, Brazil, Colombia, Costa Rica, Peru and Romania also adhere to these principles(OECD, 2024).

Although OECD recommendations are not legally binding, the framework they created and the decisions taken have become the basis of international standards and governments have prepared their own legislation within this framework(Güner, 2019).

It states that AI systems should be beneficial to society and support inclusive growth and sustainable development. It also emphasizes that AI should be developed in a way that respects the rule of law and human personal rights, always keeping the transparency criterion at the forefront and ensuring its

security, that is, protection against attacks, during its operation. Finally, it is stated that institutions and organizations that develop or operate AI systems should act in accordance with these principles(OECD, 2024).

4.2 European Parliament AI Regulations

The "Proposal for a Regulation Amending Certain Union Legislative Acts Providing Harmonized Rules on AI" was adopted by the European Union (EU) Commission on 21 April 2021, with the high participation and approval of the European Parliament (EP), which sets out the limitations and prohibitions to be observed for AI systems made available to humans(European Union, 2022a).

With this regulation, the EU prohibits attempts by AI to violate fundamental rights and equality principles of society, such as security and privacy, in matters such as discrimination, economic rights or behavioral guidance caused by biometric classification that affects people ethically and socially(European Union, 2021b). The draft regulation prepared by the European Commission was followed by the opinion adopted and published by the Council of the European Union ("EU") on the general approach to the regulation in December 2022(European Union, 2022a). In June 2023, the draft study prepared by the Members of the European Parliament regarding the approach to amend the Commission's draft regulation was published (European Parliament, 2024).

5 LEGAL APPROACHES AND CURRENT DEVELOPMENTS ABOUT AI IN TÜRKİYE AND THE WORLD

5.1 Current AI Regulations and Developments in Türkiye

Although there is no direct legal regulation regarding AI technologies in Türkiye, some provisions related to these technologies have been added with some regulations made in the legislation with the Personal Data Protection Law (KVKK). Although biometric data in particular is not clearly defined within the scope of KVKK, it is stated in the "Guide on the Processing of Biometric Data" published by KVKK that the General Data Protection Regulation (GDPR), which is also referenced in the European Union Artificial Intelligence Law, provides the most comprehensive definition.

Due to the use of personal data in AI systems, KVKK also aimed to draw attention to the relevant issue by publishing a document titled "Recommendations on the Protection of Personal Data in the Field of AI". Under the coordination of the Presidency's Digital Transformation Office, studies on eliminating AI risks and ethical practices continue with the contributions of different stakeholders, primarily the Ministry of Industry and Technology, TÜBİTAK Bilgem, AI Institute and Turkish Standards Institute. The AI Risk Management Framework has been implemented and a reference plan has been provided for mapping, measuring and managing risks. An inventory and needs pool has been created for AI and advanced analytics projects carried out in the public sector. The Public Data Area project is being implemented in cooperation with TÜİK. Public stakeholders can store, share and process data in accordance with reliable, advanced standards and guidelines in a way that guarantees data sovereignty(TRAI, 2017).

5.2 Other Legal Regulations and Decisions Implemented Worldwide

5.2.1 Global Partnership on Artificial Intelligence

The AI Global Partnership (GPAI) consists of 29 members, including Türkiye, the United Kingdom and the European Union. Its aim is to fill gaps and deficiencies in the theoretical and practical fields of AI(OECD.AI, 2019).

5.2.2 Meeting of the United Nations Security Council

18 At the council's first official meeting on 18 July 2023, United Nations Secretary-General António Guterres, speaking on AI and generative AI, emphasized the need to 'work together for AI that bridges social, digital and economic divides' He also noted that governments could establish robust and reliable evaluation systems to hold companies accountable, thereby enabling them to gain global trust(OECD.AI, 2019).

5.2.3 G20 AI Principles

The G20 AI principles, which are based on OECD principles, were adopted in 2019. Their aim is to

address concerns about AI and increase trust in AI with a human-centered approach. These principles are not binding, as in the OECD principles.(OECD.AI, 2019).

5.2.4 AI Safety Summit and Bletchley Declaration

The Bletchley Declaration, which was accepted as the first summit where country representatives and companies came together on November 1-2, 2023, to recognize the potential of AI to increase human well-being and peace, was accepted by 28 countries, including Türkiye. Its aim is to ensure that AI is designed, developed and implemented in a reliable, responsible and human-focused manner(AI Safety Summit, 2023).

5.2.5 The World Economic Forum AI Governance Alliance

The AI Governance Alliance was established in June 2023 under the umbrella of the World Economic Forum, bringing together industry leaders, government officials, academics and civil society organizations. The alliance aims to provide guidance for the ethical, responsible and secure design, development and deployment of AI systems, and has more than 250 members.

In addition, AI was among the main topics at the 54th World Economic Forum held in 2024. OpenAI CEO Sam Altman emphasized that AI offers more advanced tools and capabilities to humans, and expressed the need for coordinated governance for this technology to benefit in an inclusive and ethical way(Harvey, 2024).

5.2.6 USA Executive Order 13859

With the Presidential Decree titled Maintaining American Leadership in AI dated February 11, 2019, the US declared that it will continue to be a pioneer in AI and that it is bold in using AI technologies, emphasizing that it will ensure people's security, personal freedoms and privacy, and that it will stand against all obstacles, including the Office of Management and Budget, to benefit from all the possibilities of AI in order to protect American values. (Federal Register, 2019).

Guidance for Regulation of Artificial Intelligence Applications. The Office of Management and Budget published the Guidance for Regulating Artificial Intelligence Applications on November 17, 2020. The guidance lists the following key elements to consider when regulating AI applications: ensuring public trust, public participation in the process, scientific integrity and accuracy of information, assessing and managing risks, cost-benefit analysis, flexibility, preserving justice and preventing discrimination, the principle of information and transparency, security measures, and strengthening interagency cooperation(MacCarthy, 2020).

Voluntary Commitments of Technology Companies. Beyaz On July 21, 2023, the White House announced that OpenAI, Amazon, Anthropic, Google, Inflection, Meta, and Microsoft have voluntarily committed to taking measures to make AI technologies safer and protect users. These measures include investing in cybersecurity, conducting research on discrimination, and developing new watermarking systems that will notify users of AI-generated content. Additionally, on September 12, 2023, the White House announced that eight other technology companies, including Adobe, IBM, and Salesforce, have made similar voluntary commitments(Harvey, 2024).

Executive Order on Safe, Secure, and Trustworthy Artificial Intelligence. In order to ensure the safety of AI with the new standards, the Presidential Decree on Safe and Reliable AI was published on October 30, 2023. (Harvey, 2024).

6 DISCUSSION

All facets of social life have been impacted by artificial intelligence (AI) systems, and it is generally accepted that careful technical, ethical, and legal assessments are required(Floridi and Cowls, 2019). This need is attested to by the legal actions taken by nations and organizations around the world. The opaque (black box) structures involved in AI decision-making are frequently difficult for users, developers, and decision-makers to comprehend. As a result, these systems lose their transparency and the lines separating accountability become increasingly hazy(Floridi and Cowls, 2019). For example, the assignment of ethical and legal responsibility is complicated when autonomous vehicles are unable to provide an explanation for "why a particular decision was made" in the event of an accident(Awad et al., 2018). Similarly, when algorithmic systems make decisions that have a direct impact on people's lives, like hiring, medical procedures, or credit scoring, unexplained results raise the possibility of discrimination(Wachter et al., 2017).

Explainable Artificial Intelligence (XAI) is essential for ethical responsibility and legal monitoring in this regard. Explainability, however, shouldn't be limited to just making a model's technical elements visible. Technical transparency and giving users easily accessible and intelligible explanations are two very different things(Wachter et al., 2017). Even after all model parameters are disclosed, the user may not always fully grasp the logic behind a decision(Mittelstadt et al., 2019). Ananny and Crawford (2018)(Ananny and Crawford, 2018) specifically draw attention to the shortcomings of the ideal of transparency, contending that accountability and openness are not always interchangeable. Consequently, explainability is not just a technical necessity but rather a sociotechnical obligation.

It's now clear that ethical considerations must be incorporated into AI system design. This method encourages system developers to accept internal ethical responsibility while also offering external oversight.(Hagendorff, 2020). In this context, IEEE's Ethical Design (2019) (IEEE.org, 2019) report emphasizes that integrated design at the design level is necessary for ethical governance to be effective in artificial intelligence systems.

Therefore, this study looked at the intersection of technical, ethical, and legal requirements within the explainability framework and discovered that systems that cannot be explained can pose serious problems for social acceptance and accountability.

7 CONCLUSION

In particular, this study looked at how XAI techniques can satisfy the structural need for explainability in AI systems in morally and legally challenging situations. Explainability is the ability to keep an eye on decisions, make sure they are understandable, and permit critical assessment(Floridi and Cowls, 2019). But it's crucial to understand that explainability is a sociotechnical obligation as well as a technical requirement. To facilitate equitable and understandable technological decisions, explanations should be in line with users' mental models; meaningful user interactions—rather than merely internal system documentation—are crucial to promoting transparency(Mittelstadt et al., 2019). In this context, systems created using ethical-design methodology open the door to both internal corporate responsibility and external audit(Dignum, 2019). It is suggested that explainability mechanisms be redesigned in order to create AI systems that are human-centered and sensitive to social contexts.

Finally, "explainability serves the dual purposes of ensuring that technological decisions are both comprehensible and socially acceptable."

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