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Algorithmic Transparency in Information Systems: A Legal Necessity for the Protection of Fundamental Rights

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Abstract: Algorithmic transparency in critical information systems is an essential aspect in ensuring fair and responsible use of technologies that influence the daily lives of individuals. Algorithms are increasingly used in sensitive sectors such as finance, law, and healthcare, areas where automated decisions can have significant impacts on the fundamental rights of citizens. In the financial field, algorithms can influence access to credit, risk assessments, and investment management; in the legal system, they can determine sentences or risk assessments for defendants; and in the medical field, algorithms can decide on diagnoses or treatments for patients. Thus, algorithmic transparency becomes crucial for preventing errors and discrimination and protecting the fundamental rights of individuals. The purpose of this article is to analyse the importance of algorithmic transparency in these critical areas, identifying the main challenges and legal implications of their implementation. The methodology of the article is based on a multidisciplinary approach and proposes various regulatory and technological solutions, in order to protect the fundamental rights of individuals in the face of automated decisions.

Keywords: information system; algorithms; artificial intelligence; obligation of explanations

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1. Introduction

In recent years, the use of artificial intelligence (AI) and machine learning has increased significantly in information systems, having a direct impact on the lives and rights of citizens. Algorithms are implemented to support decision-making processes in vital areas, such as financial risk analysis, legal case processing, medical diagnosis and treatment, and employment and professional performance assessment. These technologies, through the use of large volumes of data and their ability to learn and adapt, have the potential to improve the efficiency and accuracy of decision-making processes, but at the same time, they raise major risks related to privacy, discrimination, and processing errors. Algorithmic transparency refers to the process by which decisions made by algorithms are clear, accessible and explainable to users and authorities, and explainability, a closely related concept, implies the ability to understand how an algorithm reaches a certain decision or conclusion. When we use emerging technologies, algorithmic transparency and explainability become fundamental to ensuring a fair and accountable digital system. These principles not only protect the fundamental rights of the individual but also contribute to public trust in the use of algorithms in various fields, from finance and justice to health and education work to readers. It should be divided into sections, each with a heading so that a reader can follow the logical development of the work. The need for a regulatory framework for the use of algorithms in emerging information systems is becoming increasingly evident. Without a clear set of rules governing algorithmic transparency, audibility, and accountability, the risks of abuse, violation of fundamental rights, and perpetuation of inequities can be substantial. A solid legal framework will not only protect the fundamental rights of citizens but will also ensure the development of technology that is consistent with the fundamental ethical and social values of society. Thus, it is essential to create policies and regulations that support algorithmic transparency and explainability, helping to prevent harmful automated decisions and ensuring a fair and equitable decision-making process. The main challenges and legal implications related to the use of algorithms in these areas include the opacity of decision-making processes, difficulties in understanding how algorithmic models are trained, and the lack of an adequate regulatory framework to ensure accountability and fairness of decisions. Thus, a balance is needed between the efficient use of technologies and the protection of citizens' rights, by creating clear regulations and implementing independent control mechanisms.

2. The Impact of Lack of Transparency on Fundamental Rights

Algorithmic transparency refers to the ability of users and regulators to understand how an algorithm works, what factors influence its decisions, and how data is used in the decision-making process. Explainability, a complementary concept, implies the ability of an artificial intelligence (AI) system to provide clear and understandable justifications for the decisions it makes (Rawan, 2022). The lack of these features can lead to arbitrary decisions, lack of accountability, and violations of the fundamental rights of individuals affected by algorithms. In order to prevent abuses and protect fundamental rights, it is necessary to implement a regulatory framework that imposes clear standards of transparency and explainability. Regulations should include the obligation to audit algorithms, the right of users to challenge automated decisions and strict requirements on the use of personal data. Initiatives such as the European Union's General Data Protection Regulation (GDPR) or the European Commission's proposal for an AI regulation are important steps in this direction, but further measures are needed to ensure a balance between innovation and respect for human rights. The lack of algorithmic transparency in information systems can have profound effects on fundamental rights, generating significant risks for the legal protection of individuals and for the functioning of a fair rule of law. In a context where algorithms influence essential decisions – from access to public services and economic opportunities, to justice and freedom of expression – their opacity can lead to discrimination, violation of the right to a fair trial and eroding trust in democratic institutions. One of the main rights affected is the right to non-discrimination, enshrined in numerous international instruments, such as the European Convention on Human Rights and the Charter of Fundamental Rights of the European Union. In the absence of adequate transparency, systems based on artificial intelligence can amplify and perpetuate existing prejudices, having a disproportionate impact on vulnerable groups (Kroll, 2023). For example, recruitment or bank credit evaluation algorithms can make decisions based on criteria that disadvantage certain social categories, without these people being able to understand or contest the reasons that led to their rejection. The right to a fair trial is also severely affected when automated decisions are used in areas such as criminal justice or digital surveillance (Jobin, 2022). If an algorithm recommends sentencing a defendant or classifies an individual as a security "risk" but the decision-making reasoning remains inaccessible or incomprehensible, the individual concerned cannot exercise his or her right to a defence effectively. Furthermore, the lack of transparency regarding training data and algorithmic parameters makes it impossible to identify and correct errors or potential abuses. Furthermore, the right to privacy and the protection of personal data are seriously compromised when algorithms

operate as "black boxes," without allowing users to understand how their data is collected, processed and used for decision-making. Algorithms that classify or profile individuals based on their online behaviour, without explicit and informed consent, can lead to serious violations of the right to privacy. For example, the use of opaque systems in targeted advertising or in determining insurance eligibility can generate discriminatory and invasive effects. Furthermore, the lack of algorithmic transparency affects freedom of expression and access to information, especially in the context of digital platforms that use content moderation algorithms. Decisions to remove posts, suspend accounts or limit the visibility of certain types of content are often taken on the basis of rules unknown to the public, without a real possibility of challenge. This opacity can foster censorship and manipulation of information, endangering media pluralism and the democratic health of a society. In conclusion, the lack of algorithmic transparency in information systems is not only a technical or ethical problem, but also a direct threat to fundamental rights (Floridi, 2022). Without adequate mechanisms for explainability, audit and legal control, these systems can become instruments of social exclusion, systemic discrimination and arbitrary restriction of individual freedoms. Thus, effective regulation and the imposition of transparency standards become essential to guarantee a fair democratic framework and to protect the rights of every individual in the digital age.

3. The Obligation of Explainability of Algorithms

Furthermore, the lack of algorithmic transparency affects freedom of expression and access to information, especially in the context of digital platforms that use content moderation algorithms. Decisions to remove posts, suspend accounts or limit the visibility of certain types of content are often taken on the basis of rules unknown to the public, without a real possibility of challenge. This opacity can foster censorship and manipulation of information, endangering media pluralism and the democratic health of a society. In conclusion, the lack of algorithmic transparency in information systems is not only a technical or ethical problem but also a direct threat to fundamental rights. Without adequate mechanisms for explainability, audit and legal control, these systems can become instruments of social exclusion, systemic discrimination and arbitrary restriction of individual freedoms. Thus, effective regulation and the imposition of transparency standards become essential to guarantee a fair democratic framework and to protect the rights of every individual in the digital age. Explainability can be viewed in several dimensions. On the one hand, there is global explainability, which aims to understand the general principles

of operation of a model, and on the other hand, local explainability, which refers to the justification of a specific decision within a specific instance of use. This distinction is crucial, because some "black box" models, such as deep neural networks, pose significant difficulties in terms of interpretation and traceability of decisions. Another relevant aspect is the balance between explainability and performance. Often, highly complex models, such as those based on deep learning, have high accuracy, but are difficult to explain, which can create problems in their adoption in environments where transparency is a fundamental requirement (Hukkinen & Christodonlon, 2023). Therefore, interpretability methods are being developed, such as feature importance analysis techniques, methods based on approximating complex models by simpler models (for example, LIME – Local Interpretable Model-agnostic Explanations), or the use of visualizations to highlight the internal mechanisms of an algorithm. Articles such as "Thinking Traps: How High-Performance Information Systems Correct Cognitive Biases in Decision-Making" and "Information System for Macroprudential Policies" substantiate the role of information systems in correcting cognitive errors and supporting the decision-making process, providing an applicable framework also in analyzing the impact of algorithmic transparency on accountability, control, and governance in the digital context (Dragomir, 2025a; Dragomir, 2025b; Dragomir, 2025c). The obligation of explainability of algorithms is a fundamental requirement in a digitalized society, where automated decisions can have profound consequences for individuals and organizations. This not only fosters trust and acceptance of advanced technologies, but also contributes to preventing abuses, ensuring fairness in decision-making processes and compliance with applicable regulations. Explainability should therefore not be seen solely as a technological constraint but as an essential element for ethical and responsible artificial intelligence. The increasing use of algorithms in automated decisions has made the obligation of explainability a central issue in protecting citizens' fundamental rights. Algorithmic explainability refers to the ability to understand and explain how an algorithm reaches a certain decision or recommendation, thus ensuring the transparency of the decision-making process and allowing users to challenge or better understand how their data is being processed. In the European Union, this principle is explicitly supported by data protection legislation, particularly through the General Data Protection Regulation (GDPR).

3.1. The Principle of the "Right to Explanation" in European Law

The GDPR, adopted in 2016, gives European citizens more rights in relation to their data, and one of the most important is the right to an explanation. Article 22 of the GDPR specifically addresses automated decisions, including those based on user profiling, and requires that data subjects have the right to obtain an "explanation" when they are subject to an automated decision that significantly affects them.

4. Legislative Framework and International Initiatives for Algorithmic Transparency

As society becomes increasingly digital, algorithms play a central role in automating decision-making processes, and their use is growing exponentially, influencing areas as diverse as finance, health, justice and public administration. This trend requires rigorous oversight and robust regulations to ensure that automatically generated decisions comply with fundamental principles of fairness, transparency and accountability. Without an adequate regulatory framework, the risks associated with the non-transparent use of algorithms can lead to significant harm for individuals and society, including discrimination, privacy violations or decision-making abuses. Existing regulations and international initiatives on algorithmic transparency are becoming essential pillars in protecting citizens' fundamental rights. The European Union, through legislative instruments such as the AI Act and the General Data Protection Regulation (GDPR), imposes strict requirements on how artificial intelligence systems are developed, used and monitored. These regulations aim not only to protect users against opaque and arbitrary decisions, but also to stimulate responsible innovation, creating a balance between technological progress and compliance with ethical norms. In addition to European regulations, many countries and international organizations, such as the OECD, the UNO and the G7, are promoting standards and legislative frameworks aimed at ensuring the safe and ethical use of artificial intelligence at a global level. Despite these advances, the complexity and speed with which algorithmic technologies evolve require continuous improvement of existing regulations. The need for independent audit mechanisms, clear criteria for certifying AI systems used in critical sectors and effective institutional oversight to prevent abuse is increasingly highlighted. In conclusion, given the profound impact of algorithms on daily life, it is imperative to strengthen a regulatory framework that ensures the ethical and responsible development of artificial intelligence. At both European and international levels, current regulations represent a solid starting point, but efforts to improve them must

be continuous, adaptable and aimed at protecting citizens' fundamental rights in the face of an unprecedented expansion of technology.

4.1. Existing Regulations

One of the most important pieces of legislation in the field of data protection and algorithmic transparency at the European level is the General Data Protection Regulation (GDPR). Adopted in 2016 and applicable since 2018, the GDPR regulates the processing of personal data of European Union citizens, and Article 22 introduces a key principle: the right to explainability of individuals affected by automated decisions. Thus, when an individual is subject to an automated decision, including a profiling algorithm, they have the right to be informed about the logic used, as well as the consequences of this decision for them. This legislative framework represents an important first step in guaranteeing algorithmic transparency and protecting the fundamental rights of European citizens. Another significant step is the European Union's proposed AI Act, which aims to establish clear and rigorous rules for the development and use of artificial intelligence in various sectors. Adopted in 2021, this proposal regulates the use of AI according to the risks it poses, considering the areas in which it can be implemented, from health and justice to critical infrastructure and public safety. The AI Act requires that AI systems used in critical areas comply with strict transparency and explainability requirements, and in certain cases, algorithms must be audited and verified by independent authorities to ensure compliance with the rules and the protection of fundamental rights. In international affairs, states such as the US and China are also involved in regulating AI, although their approaches differ. In the United States, regulations are fragmented and apply differently to different types of industries. American authorities have begun to pay increasing attention to algorithmic transparency, with proposals for regulations in the areas of consumer protection and combating discrimination. For example, the Federal Trade Commission (FTC) has issued guidance for the ethical use of AI, highlighting the importance of transparency in the use of algorithms in business. In China, authorities regulate AI through a series of regulations aimed at national security and data protection, and algorithmic transparency is integrated into the general rules, with the emphasis being more on state control and less on individual protection.

4.2. Proposals for Improving Regulation

Despite progress in existing regulations, significant challenges remain in terms of algorithmic transparency and accountability. That is why there are several proposals to improve the regulation of this area. One of the main proposals concerns the obligation to audit algorithms. While some current regulations require audits of algorithms under certain conditions, such as under the AI Act or the GDPR, a global and uniform framework that would oblige all entities using algorithms to carry out periodic independent audits would help ensure compliance with transparency and ethics rules. These audits could assess not only the efficiency of algorithms but also the possible risks of discrimination and the impact on citizens' fundamental rights. Another proposal aims at certifying AI for use in critical areas. Given the direct impact that algorithms can have in essential sectors such as health, justice, and critical infrastructure, creating a certification system that guarantees that algorithms used in these areas comply with transparency, security, and ethical requirements could help protect citizens and ensure responsible use of AI. Certification could include verification of algorithm transparency, testing for potential risks of discrimination, and validation in accordance with international regulations, thus leading to a trusted information system. These measures would lead to the establishment of independent oversight bodies to ensure compliance with existing regulations and to monitor the implementation of new ones. These bodies should have the role of analyzing the impact of automated decisions on citizens' fundamental rights and intervening in cases of transparency breaches or abuses related to the use of algorithms. In addition, these authorities could provide clear guidance on best practices in the field and support the development of a global regulatory framework. The current legislative framework and international initiatives for algorithmic transparency are an important step in regulating the use of artificial intelligence, but there are still many challenges to be addressed to ensure a balance between innovation, the protection of fundamental rights and accountability. Proposals for improved regulation, such as algorithm auditing, AI certification, and the creation of independent oversight bodies, can significantly contribute to the development of a more responsible, fair, and transparent digital ecosystem.

5. Conclusion

Artificial intelligence-based information systems offer remarkable opportunities for streamlining decision-making, but they also raise significant legal and ethical challenges. Establishing legal liability for automated decisions is essential to protect individual rights and ensure the responsible use of AI. At the same time, ethical

dilemmas regarding transparency, fairness, and the social impact of these systems should not be neglected. Without a clear legal framework and well-defined ethical principles, the use of AI in decision-making risks becoming a source of inequities and uncertainties. A balanced approach is therefore needed, combining technological innovation with social and legal responsibility. The lack of transparency in AI-based systems can have serious consequences for fundamental rights, affecting the fairness, fairness and accountability of decision-making. It is therefore essential that the development and implementation of these technologies are accompanied by effective regulatory mechanisms that guarantee user protection and ensure a high degree of trust in automated systems. In the digital age, algorithms are increasingly used in decision-making processes, influencing fundamental aspects of individuals' daily lives. From employee selection and credit assessment to personalized recommendations on online platforms, they are essential tools for a wide range of societies. However, the use of algorithms also brings significant challenges in terms of respecting citizens' fundamental rights, such as the right to privacy, the right to non-discrimination and the right to a fair trial. In this context, algorithmic transparency plays a crucial role in protecting these rights. It is essential that algorithmic processes are clear, accessible and explainable so that individuals can understand and challenge the decisions they make. The importance of algorithmic transparency for the protection of fundamental rights is a key principle in ensuring a fair and just digital system. Algorithms that make automated decisions can have direct effects on individuals, and the lack of transparency about how they are trained and applied can lead to discrimination, errors, or abuse. Therefore, it is necessary that entities that develop and implement algorithms are required to provide clear information about how they work, what data is used and what the decision criteria are. Increased transparency not only protects fundamental rights but also contributes to public trust in emerging technologies. The need for clearer regulation and effective control mechanisms is imperative to prevent risks related to the use of algorithms. Although various regulatory initiatives are already in place, such as the GDPR in the European Union, in many cases they are insufficient or ineffective in the face of the complexity of current algorithms. Regulations need to evolve in parallel with technology, ensuring that clear rules on transparency, auditability, and algorithmic accountability are established. In addition, independent control mechanisms need to be implemented, allowing for the constant monitoring and assessment of the impact of algorithms on the fundamental rights of individuals. Future directions in the field of algorithmic transparency require close collaboration between states, researchers and companies, to create ethical and effective solutions. States can play an important

role in establishing a global legal framework that regulates the use of algorithms and protects citizens' rights. Researchers are essential for the development of new technologies and methodologies that guarantee the transparency and impartiality of algorithmic processes. At the same time, companies developing these technologies must adopt responsible practices and actively participate in creating innovative solutions based on ethical principles. Collaboration between all these entities is essential for the development of a sustainable and equitable digital ecosystem that responds to the challenges and maximizes the benefits of technology, while protecting the fundamental rights of citizens. In conclusion, algorithmic transparency, clear regulations and collaboration between various stakeholders are key factors in ensuring the responsible and equitable use of algorithmic technologies. Only by implementing effective and ethical solutions will we be able to protect the fundamental rights of individuals in the face of rapid technological advancement.

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