Ethics of Using Artificial Intelligence in the Analysis of Possession for Usucapion

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Abstract

This paper analyzes the complexity and ethical implications of using artificial intelligence (AI) in the legal process of establishing possession, as a fundamental element of usucapion. In Romanian civil law, usucapion represents an original way of acquiring property, conditioned by a useful, continuous, uninterrupted, undisturbed possession and under the name of the owner, according to art. 930 of the Civil Code. The assessment of these conditions is, traditionally, the attribute of the court, but the emergence of AI-based technologies introduces new ways of factual and evidentiary analysis, which require an adequate ethical and legal framework. The use of AI in the field of law, including in the context of usucapion, promises to increase efficiency by analyzing large volumes of data – such as satellite images, cadastral archives or video recordings – and by corroborating information obtained from various sources. However, these advantages are counterbalanced by significant ethical risks: algorithmic errors, lack of decision-making transparency and the possibility of systemic discrimination caused by incomplete or biased data. A central aspect of the ethical approach is the risk that algorithms may misinterpret the nature of possession – for example, considering sporadic presence as continuous possession. Such errors can seriously affect the recognition or rejection of a property right. Furthermore, the use of AI in legal proceedings calls into question the respect of the fundamental principles of the right to defense and adversarial proceedings, especially when the algorithms cannot be audited or explained (so-called "black box algorithms"). Another crucial element is the compatibility of the use of AI with the right to privacy. Since the analysis of possession frequently involves the use of personal data – images, digital footprints or information from social networks – it is essential that this practice complies with the legislation

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on the protection of personal data (GDPR), and the case law of the ECHR. In legal terms, evidence generated or interpreted by AI must comply with the conditions of admissibility and loyalty of evidence, as provided for in the Code of Civil Procedure. Any evidence administered must be able to be contested, interpreted and discussed equally by the parties, which is not always guaranteed in the case of opaque or insufficiently documented AI. The paper therefore proposes a series of recommendations: using AI only as an assistive tool, not a decision-making one; auditing and external validation of the algorithms used; establishing a clear right to contest the results generated by AI; and developing a specific regulatory framework to regulate the use of automated technologies in the field of real rights. In conclusion, although AI can bring important benefits in the management and assessment of possession for usucapion, these advantages must be balanced by rigorous legal and ethical control, in order to protect the fundamental rights of the person and to maintain the integrity of the act of justice.

Keywords: *Usucapion; legal; possession; artificial intelligence.*

1. Introduction

In the context of the profound transformations generated by the digitalization of legal systems, artificial intelligence (AI) has begun to be used more and more frequently in various stages of the judicial process, including in the analysis and interpretation of evidence (Terec-Vlad, 2025). One of the most challenging research directions aims at applying AI in the field of real rights, more precisely in the analysis of possession as an essential element of the acquisition of property through usucapion. However, this approach raises multiple ethical and legal questions.

Usucapion is a fundamental institution of civil law, being an original way of acquiring private property, based on a useful possession exercised for a period established by law. In Romania, the current regulation of usucapion is provided for in art. 930 et seq. of the Civil Code, which states that "property is acquired through uninterrupted possession for 10 or 30 years, as the case may be, provided that it has been exercised under the name of the owner" (Civil Code of Romania, art. 930). Possession, as a complex legal fact, involves a series of material and intentional elements – corpus and animus – whose evaluation involves the assessment of sensitive

factual circumstances, such as continuity, public nature and the absence of defects of possession.

In this equation, AI could be used as a support tool for courts and practitioners, in order to analyze relevant evidence for establishing possession: satellite images, video recordings, cadastral documents, digital archives, etc. The ability of algorithms to quickly and efficiently analyze large data sets creates the premises for a significant transformation of the way in which usucapion is approached in practice. For example, an AI system could recognize patterns of possessor behavior, corroborate temporal and spatial data, and even anticipate possible conflicts between competing possession rights (Surden, 2019, pp. 1305–1338). However, this transformation comes with a number of ethical challenges. AI can produce errors of interpretation, introduce elements of algorithmic discrimination (due to biases in the training data), and – more seriously – reduce the degree of transparency of the decision-making process. In civil law, where the principles of adversarial proceedings and the right to a fair hearing are essential, any technological interference must be analyzed with caution.

Furthermore, the use of AI in the context of possession also involves aspects of personal data protection, given that much of the relevant evidence (photographs, geolocation, social media data) may fall under Regulation (EU) 2016/679 (GDPR) (General Data Protection Regulation, 2016). Thus, there is a need to establish firm guarantees to ensure respect for the right to privacy and the principle of proportionality in data collection and processing.

Internationally, bodies such as the European Commission for the Efficiency of Justice (CEPEJ) and the Council of Europe have adopted guidelines on the use of AI in justice, emphasizing the need to respect the fundamental values: transparency, accountability, non-discrimination, impartiality and human control (European Commission for the Efficiency of Justice [CEPEJ], 2018). These principles must form the basis of any system that uses AI in the evaluation of legal facts.

Consequently, this paper aims to analyze, from a critical and interdisciplinary perspective, the ethical and legal implications of using artificial intelligence in the analysis of possession for usucapion. It will be investigated to what extent such a technological tool can support the act of justice without compromising the fundamental rights of litigants and without substituting the human judgment of the judge.

2. Usucapion and possession: a legal perspective

Usucapion, also known as acquisitive prescription, is an original way of acquiring property rights, based on the exercise of useful, uninterrupted and lawful possession for a specified period of time. The institution has a dual legal function: on the one hand, it ensures the stability of property relations by confirming a long-standing factual situation; on the other hand, it sanctions the passivity of the holder of the real right in defending his prerogatives (Baias, 2012, p. 951). In the current regulation of the Romanian Civil Code, usucapion is dealt with under art. 930-940. The law recognizes two main forms of usucapion: tabular usucapion (for immovable property registered in the land register) and extra-tabular usucapion (for immovable property not registered or registered incorrectly) (Bîrsan, 2005, p. 369). Regardless of its form, the essential element for the existence of usucapion is possession, in its qualified legal form.

2.1. The legal notion of possession

Possession is a state of fact recognized and protected by law, which consists in the effective exercise of a real right (usually the right of ownership), accompanied by the will to behave as the holder of that right (Stoica, 2004, p. 165). From a legal point of view, possession involves two fundamental elements:

• Corpus: the physical manifestation of possession of the good, that is, the actual exercise of the prerogatives conferred by the real right;

• Animus: the intention of the possessor to behave as the true holder of the right, which excludes possession exercised on behalf of another (for example, of the precarious holder).

This duality is particularly relevant in the context of the evaluation of the evidence regarding usucapion, since only a possession that meets both elements can produce legal effects in the sense of acquiring ownership (Stoica, 2004, p. 167).

2.2. Conditions of possession useful for usucapion

To be capable of producing legal effects, possession must be:

• Continuous: there must be no voluntary or forced interruptions in the exercise of the right;

• Uninterrupted: not be contested by judicial actions or interventions of the true owner;

• Undisturbed: not be exercised abusively or violently;

• Public: visible and known, without being hidden or clandestine;

• Under the name of the owner: the possessor must behave as the owner and not on the basis of a derivative right (e.g., easement, lease) (Civil Code of Romania, art. 930 para. 2).

In practice, the establishment of these conditions is often a matter of fact, left to the discretion of the court, based on the evidence administered. This is where the possibility of using artificial intelligence comes in to support the objective assessment of the owner's behavior, but, as will be shown in the following sections, this use must be subject to clear ethical and legal rigors.

2.3. Typology of usucapion in Romanian law

The current Civil Code distinguishes between several types of usucapions:

• Extra-tabular usucapion (Civil Code of Romania, art. 930), applicable to immovable property not registered in the land register or registered incorrectly. The term is 10 years if the possessor is in good faith and has a just title, or 30 years otherwise;

• Tabular usucapion (Civil Code of Romania, art. 931), which involves possession exercised by a person who appears in the land register as the holder of a real right. It has a more simplified character, strengthening trust in land records;

• Movable usucapion, regulated by art. 937–940 Civil Code of Romania, applicable to tangible movable property, where acquiring ownership is much easier (sometimes immediate) if the possessor is in good faith and has a just title.

Thus, the nature of possession and the type of property are decisive in determining the applicability of usucapion. From this perspective, it is observed that Romanian law maintains a balance between the protection of property and the establishment of a durable state of affairs that is not in the interest of the real owner.

2.4. The problem of proof of possession

Proof of possession is crucial for the admission of an action for the establishment of usucapion. This can be done by any means of evidence: witnesses, documents, photographs, video recordings, cadastral reports, etc. The court has a wide margin of appreciation, but traditionally the analysis is subjective, dependent on the context.

The use of artificial intelligence in this field involves the digitization of this evidence and the application of behavioral or temporal analysis algorithms – which raises questions related to the validity and interpretability of evidence generated or evaluated by computerized systems. It is essential that the analysis of possession

remains, ultimately, a matter of human judgment, even if technologically assisted.

3. AI in the legal field: opportunities and limits

Artificial intelligence (AI) is becoming increasingly present in the legal field, as part of the process of digitalization of justice and the need to streamline judicial activities. From the automation of repetitive tasks, such as searching for relevant case law, to the prediction of court solutions or automated legal assistance, AI promises a technological advance that, with all its benefits, also requires critical reflection on the limits and risks of this process.

3.1. Opportunities offered by AI in the legal field

The use of artificial intelligence in the legal field is based on the ability of algorithms to process large volumes of data with a speed and precision that exceed human capabilities. In this context, AI can bring the following advantages:

• Automation of repetitive activities: Systems such as LexisNexis or ROSS Intelligence allow rapid consultation of legal databases, automatic drafting of documents and identification of relevant decisions from case law (Susskind, 2017, p. 86).

• Streamlining case management: Platforms such as CaseText or DoNotPay can provide primary legal advice, automated scheduling of deadlines and even drafting of simple complaints in matters such as consumer rights or administrative fines.

• Decision support: In some jurisdictions (e.g. USA, China, Estonia), algorithms are already used to assess the degree of procedural risk (in criminal cases or in matters of recidivism), establishing predictive scores that assist courts or criminal prosecution bodies (Ashley, 2017, pp. 221–234).

• Evaluation of digital evidence: AI can analyze complex content, such as video recordings, online behaviors or GPS tracks, providing a coherent picture of material facts, relevant including in cases regarding usucapion.

3.2. Limitations of the use of AI in justice

Although attractive from the perspective of efficiency, the use of AI raises essential issues from the perspective of legality, transparency and fairness of the act of justice. Among the most important limitations are:

• Lack of algorithmic transparency ("black box"): Many advanced AI systems (deep learning, neural networks) do not provide a clear explanation of how they reach a conclusion. In law, this lack of transparency may contravene the requirements for motivating the court decision and the principle of adversarial proceedings.

• Risk of algorithmic discrimination: AI processes historical data that may contain systemic biases (e.g., in terms of ethnicity, gender, socio-economic status), which may lead to the perpetuation or even amplification of these inequalities. In justice, such errors can seriously affect the right to a fair trial.

• Legal liability issues: One unresolved issue is the attribution of liability if an algorithm produces an error with legal consequences. Who is responsible: the developer, the institution that used the AI, or the judge who took over the conclusions of the algorithm?

• Inadequacy to moral and contextual nuances: AI operates on the basis of a binary logical model, but legal interpretation often involves ethical, social, and cultural nuances that algorithms cannot fully understand. This limits the applicability of AI in matters such as family law, civil law, or in the analysis of possession in the context of usucapion, where local context and intention are of major importance.

3.3. Regulation and good practices

International institutions have begun to develop guidelines on the use of AI in the field of justice. The European Commission for the Efficiency of Justice (CEPEJ) adopted in 2018 the European Charter of Ethics on the Use of AI in Judicial Systems, establishing five fundamental principles: respect for fundamental rights, non-discrimination, quality and security, transparency and human control.

In the same sense, the draft European Union AI Regulation (AI Act) classifies legal applications of AI in the category of high-risk systems, subject to strict requirements of auditability, explainability and human oversight.

4. Legal considerations regarding the use of evidence generated by artificial intelligence in usucapion

In the context of proving possession useful for establishing usucapion, the use of technologies based on artificial intelligence (AI) introduces a new dimension to the nature and validity of evidence administered in civil proceedings. The central issue is to what extent evidence generated, processed or assessed with the support of AI can be accepted by courts of law, without compromising the fundamental

principles of the right to a fair trial, adversarial nature and legality of evidence.

4.1. Nature of evidence in the matter of usucapion

In Romanian law, usucapion is not an automatic legal institution, but requires the intervention of the court to verify the fulfillment of the legal conditions of possession. According to art. 930 of the Civil Code, "property can be acquired by usucapion if the possessor has exercised useful possession over the asset for a time determined by law".

Proof of continuous, public possession and under the owner's name is therefore essential. In practice, this is achieved through:

- witness statements attesting to the possessor's behavior;
- documents (contracts, invoices, receipts);
- cadastral reports;
- photographs, video recordings, drone recordings, satellite data.

In such an evidentiary context, AI can be used to analyze, synthesize or generate some of these means of evidence – but each technological intervention must be legally validated.

4.2. Validity of AI-generated evidence

According to art. 250 of the Code of Civil Procedure, "evidence must be administered in compliance with the principle of adversarial proceedings and in compliance with legality". Thus, any means of evidence must be:

- lawful (obtained in compliance with the law);
- relevant to the resolution of the case;
- conclusive and useful.

The essential problem arises when evidence is generated or interpreted exclusively by an AI system. If, for example, an algorithm analyzes satellite data and "deduces" a period of possession (based on visible changes in the terrain), the question arises: can this conclusion be considered evidence in itself, or just a technical opinion? (Vlad, 2019).

Recent legal doctrine and tangential jurisprudence tend to consider such data as technical-scientific evidence, which requires the interpretation of a human specialist (Stoica, 2004, p. 160). Thus, it is not the algorithm, but the expert (surveyor, appraiser, geodetic engineer, etc.) who should provide the qualified opinion on possession.

4.3. Challenges related to adversarial nature and access to explanation

Black box AI (unexplainable) poses a major difficulty in respecting adversarial nature. If the opposing party cannot understand how the algorithm reached a conclusion (for example, that the land has been used continuously for 10 years), it will not be able to effectively challenge that evidence.

This lack of transparency affects not only the right to defense, but also the court's obligation to justify the decision in law and fact. Thus, the automatic acceptance of algorithmic conclusions could lead to a loss of the judge's role as a guarantor of legality and fairness (Wachter, Mittelstadt, & Russell, 2018, pp. 841–887).

According to the case law of the European Court of Human Rights (ECHR), a decision must not only be formally reasoned, but also "intelligible to the parties and the public". If essential elements of the decision are based on opaque AI, a violation of Article 6 of the ECHR may be invoked.

4.4. Issues of authenticity and integrity of data

AI can generate synthetic images, recognize patterns or fill in missing data. This entails risks regarding the authenticity of evidence. A video image "reconstructed" based on machine learning (for example, to suggest a constant physical presence on a plot of land) can be misleading, if it is not clearly delimited from the observable raw facts.

In this regard, a firm distinction must be made between:

• raw factual data (authentic recordings, timestamps, unprocessed images);

• algorithmic interpretations (inferences drawn by AI based on probability models).

Only the former can be unconditionally admitted as evidence. The others must be subject to a rigorous validation process through technical expertise and can be contested in court (Hildebrandt, 2015, p. 93).

4.5. Regulation and good practices

Given the aforementioned difficulties, several regulatory directions and good practices for the use of AI in proving usucapion are outlined:

• Auditability and traceability: any AI system used in the generation or interpretation of evidence must keep a clear log of the processes applied.

• Human validation: all AI interpretations must be confirmed by a technical report signed by an accredited specialist.

• Extended adversarial nature: the opposing party must have access to the source code or algorithmic logic, to the extent that it directly influences the decision.

• Limitation to an advisory role: AI must not take the place of the judge or expert, but must assist the decision-making process.

5. Right to privacy and data protection

The introduction of artificial intelligence (AI) in the analysis of possession for usucapion involves, in addition to the traditional technical and legal aspects, a set of concerns related to the protection of the fundamental right to privacy and personal data (General Data Protection Regulation, 2016, art. 6). These concerns stem from the nature of the data processed in the context of the assessment of possession, which often includes sensitive elements such as video images, geospatial data, data from digital sources or information collected indirectly. Thus, the use of AI in this context must comply with a clear and rigorous legal framework, taking into account both national and European and international norms.

5.1. Right to privacy in the context of usucapion

The right to privacy is protected by the Romanian Constitution (art. 26) and by articles 7 and 8 of the European Convention on Human Rights (ECHR), which recognize the right to respect for private and family life. In the context of usucapion, the assessment of possession may involve the collection and analysis of personal data of the possessor or other third parties, such as images of the land or the home, data on the activity carried out on the property in question or other related information.

Since possession must be “public” but also “undisturbed”, the assessment may conflict with the privacy of the individuals involved, especially when modern surveillance or data collection technologies are used. For example, the use of drones or satellite images may capture activities that go beyond the strict area of legal interest and may affect the privacy of the possessor or neighbors.

5.2. Personal data protection and artificial intelligence

The data protection regime in the European Union is mainly regulated by Regulation (EU) 2016/679, known as the GDPR, which imposes strict standards on the processing of personal data. Data processed in the analysis of possession, if they allow the direct or indirect identification of a natural person, are considered personal data and benefit from special legal protection.

The application of AI in this matter involves a series of legal requirements:

• Lawfulness of processing: Processing must be based on a clear legal basis, such as the informed consent of the data subject or an express legal obligation, which may also include the need to protect rights in legal proceedings.

• Data minimization principle: Only data strictly necessary for the purpose of assessing possession should be collected and processed, avoiding excess or unjustified use of sensitive information.

• Transparency and information: Data subjects must be informed of the purposes of the processing, the duration of storage and the rights they have, including the right to access, rectification and opposition.

• Data security: AI systems must ensure appropriate technical and organizational measures to prevent unauthorized access, loss or disclosure of data.

5.3. Specific challenges of using AI in usucapion

The use of AI raises particular issues regarding:

• Automation of decisions: According to art. 22 GDPR, individuals may not be subject to a decision based solely on automated processing without human intervention, with strictly regulated exceptions. In the context of usucapion, decisions on the recognition of possession must benefit from human judicial review and the possibility of challenging the assessment generated by AI.

• Complexity and opacity of algorithms: AI models can be difficult to explain and can generate “black boxes” in which the justification of the decision becomes inaccessible to the data subjects. This contravenes the right to a fair trial and a reasoned decision.

• Risk of discrimination: Historical data or the training of algorithms may contain implicit bias, leading to unfair or discriminatory decisions in the recognition of possession, affecting the fairness of the process.

5.4. European case law and perspectives

The European Court of Human Rights has highlighted in several cases (e.g. Satakunnan Markkinapörssi Oy v. Finland, 2017) the importance of protecting privacy in the face of modern technologies, including in administrative or judicial proceedings. The European Commission and the Council of Europe also promote the development of ethical standards for the use of AI, including in the judiciary, insisting on the principles of transparency, accountability and human oversight.

5.5. Recommendations for a balanced application

To ensure respect for the right to privacy and data protection in the context of AI-assisted usucapion, it is recommended to:

• Adopt clear regulations on the limits of the processing of personal data for the purpose of usucapion;

• Establish rigorous audit and control procedures for the algorithms used;

• Guarantee the parties' access to information on the processing method and the possibility of contesting decisions;

• Provide professional training for legal operators on the implications of the GDPR and ethics in the use of AI;

• Implementing robust technical data security measures.

In conclusion, the use of artificial intelligence in the analysis of possession for usucapion represents a major challenge for the protection of the right to privacy and personal data. Although technology can bring considerable benefits in streamlining the judicial process, it must be accompanied by robust safeguards to prevent risks of violations of fundamental rights. Only by striking an appropriate balance between technological innovation and respect for data protection can the justice system ensure both efficiency and fairness in decisions on usucapion matters.

6. Conclusions

The analysis of possession in the usucapion procedure is a complex process, involving a detailed assessment of sensitive factual elements, such as continuity, public character, uninterrupted use and use of the property under the owner's name. The introduction of artificial intelligence (AI) in this field represents an innovation with significant potential to streamline the evidentiary process, but also a source of major ethical and legal challenges, which must be approached with the utmost caution.

From an academic point of view, AI offers advanced possibilities for processing and correlating factual data, including through the analysis of diversified sources – satellite images, cadastral archives, digital data, etc. This can lead to a more objective, rapid and precise assessment of possession in relation to legal criteria. However, AI is dependent on the quality and correctness of the input data, as well as on the interpretation algorithms, which may incorporate systematic errors or unintentional biases. From this perspective, the ability of AI to completely replace human reasoning is limited, and human supervision and interpretation remain indispensable.

From a legal perspective, the use of AI in analyzing possession for usucapion raises challenges regarding compliance with the fundamental principles of civil procedure: the right to a fair trial, adversarial proceedings and the transparency of the judicial act. Decisions based on AI must be reasoned and explainable, and access by the parties to understanding how they were generated is essential to avoid a decision-making "black box" that would hinder judicial review and the exercise of the right to defense. Furthermore, the admissibility of evidence generated or analyzed by AI must comply with civil procedure rules, and any algorithmic errors must be able to be effectively challenged.

Ethical aspects become all the more significant as AI involves the processing of personal data, often sensitive, such as video images or location data, which requires strict compliance with data protection rules and the right to privacy, in line with the GDPR and the case law of the ECHR. In the absence of robust safeguards, the risk of fundamental rights violations is significant and the legitimacy of the usucapion process may be questioned.

In order to balance the benefits and risks, it is imperative to adopt a framework of good practices and clear regulations that include:

• Limiting the use of AI to a strictly assistive role, without replacing the final human decision;

• Obligation of algorithmic transparency and independent auditing of AI systems;

• Right of parties to access explanations on how AI works and interprets its results;

• Data protection and compliance with rules on confidentiality and informed consent;

• Professional training of judges and legal practitioners in the field of digital technologies.

In conclusion, the use of artificial intelligence in the analysis of possession for usucapion represents an important opportunity to

modernize and streamline the judicial process. However, the success of integrating AI in this area depends on a careful balance between technology and human values, between innovation and strict respect for fundamental rights. Only in this way can a modern, fair and accessible justice system be guaranteed, which capitalizes on the advantages of technology without compromising essential ethical and legal principles.

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