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THE IMPACT OF DIGITAL TRANSFORMATION ON THE ADMINISTRATION OF THE EUROPEAN JUDICIAL SYSTEM: NORMATIVE, INSTITUTIONAL AND ETHICAL CHALLENGES

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Abstract
The present paper engages in a critical and methodological analysis of the effects generated by the digitization process on the organization and administration of the judiciary within the European Union, placing itself in a context where national legal traditions face the imperative of technological modernization. The study rigorously evaluates the concrete implications of the integration of digital tools in the judicial activity, manifested by the implementation of electronic systems for the management of judicial files (e-justice), the algorithmizing of the distribution of cases and the use of artificial intelligence technologies in the decision-making processes of the courts.
Starting from a detailed analysis of the relevant European framework – including the European e-Justice strategy and related policy documents – the research identifies the main legal and institutional challenges driven by digital transformation. In particular, it examines the need to ensure independence and impartiality in the context of digitization, the strict protection of personal data and the confidentiality of judicial proceedings, the risks associated with external influence on the management of judicial data, as well as the danger of excessive standardization that could compromise the specificities of national legal systems.
The methodology adopted is of a comparative nature and includes case studies of European states recognized for their technological advance, such as Estonia and Germany, alongside a thorough examination of the situation in Romania, in the context of recent judicial reforms. The conclusions undertaken aim to issue precise institutional and legislative recommendations, aimed at optimizing the integration of digital

technology in judicial systems, while guaranteeing a harmonious balance between administrative efficiency and the functional autonomy of the judicial authority.
Keywords: *digital justice; judicial governance; algorithmic decision-making*
JEL Classification: H83; K23; O33.

1. INTRODUCTION

Digital transformation has become a key factor in the modernization of public services globally, including in judicial systems. In the European context, the digitalisation of justice – i.e. the adoption of information and communication technologies (ICT) in courts and judicial proceedings – is seen as a means to improve access to justice, the efficiency of the judicial act and the transparency of the judicial process (European Commission, 2020). The European Commission has highlighted that digital technologies have the potential to keep justice systems functioning even in crisis situations (such as the COVID-19 pandemic) and to ensure effective cross-border judicial cooperation (European Commission, 2020). Thus, digitalisation has become a priority on the European Union's agenda, materialised through e-Justice Action Plans, Commission Communications and dedicated financial instruments (e.g. funds allocated through the Recovery and Resilience Facility) to support Member States' efforts to modernise their courts (European Commission, 2020).

However, the implementation of digital transformation in the judicial system involves a series of complex challenges, which go beyond the simple purchase of IT equipment. First, there are regulatory challenges – legislation and regulations need to be adapted to enable the full use of digital tools (such as electronic documents, digital signatures, online filing platforms) in conditions of validity and respect for fundamental rights (CMS, 2023). Secondly, institutional challenges are manifesting – the digital transformation requires organisational changes within courts and judicial administration, investment in infrastructure and staff training, as well as overcoming resistance to change from judicial actors accustomed to traditional procedures. Last but not least, ethical challenges arise – from ensuring the right to a fair trial under the conditions of using new technologies (e.g. remote hearings), to the protection of personal data and the avoidance of any discrimination or prejudice introduced by algorithms or artificial intelligence in the act of justice (Council of Europe, 2018). These three categories of challenges – normative, institutional and ethical – are interdependent and require a comprehensive and cross-sectoral vision.

The digitalisation of justice is not only a technical or administrative issue, but also involves legal issues (such as the legal validity of electronic documents, the amendment of procedural codes, judicial cooperation at EU level), public management issues (organisation of courts, allocation of resources, training of digital skills among staff) and ethical and human rights issues (confidentiality of judicial data, the right to a defence and to a fair trial, the impartiality and

transparency of the algorithms used). The present paper aims to investigate the impact of the digital transformation on the administration of the European judicial system from this multiple perspective, identifying the main challenges in the three mentioned spheres and illustrating them with relevant comparative examples from three EU Member States: Romania, Estonia and Germany. The choice of these comparative examples is based on different situations: Estonia as a pioneer of e-government in Europe, with an advanced level of digitalisation in the legal field, Germany as a large judicial system that is gradually implementing digital reforms and Romania as a transitional system, at an average level in the EU in terms of e-justice, facing both progress, and significant obstacles (Szentpáli-Gavallér, 2024).

The methodology will describe how the analysis was carried out (mainly through desk research and legal-administrative comparison). The Results section will present findings on the impact of digital transformation in the judicial system and the associated challenges – organized on normative, institutional and ethical dimensions, with examples from Romania, Estonia and Germany. Finally, the Discussions and Conclusions section will interpret these results in a broader European context, highlighting the practical implications of the findings and possible courses of action for policymakers.

2. METHODOLOGY

The present study is based on a qualitative research methodology, having as its main tool the documentary analysis of legal sources and specialized literature. Policy and legislative documents at European Union level (such as European Commission Communications on the digitalisation of justice, e-Justice Action Plans, Commission and Council of Europe reports), studies and research reports (including articles from legal and public administration journals, comparative studies and relevant statistical data) were examined. Quantitative data and indicators available in official European reports – in particular the EU Justice Scoreboard – were also used to contextualise the level of digitalisation of justice systems in different Member States and highlight comparative gaps and progress (European Commission, 2022).

The comparative approach consisted of the selection of three case studies: Romania, Estonia and Germany. The selection criterion was the varying degree of advancement in the digitalisation of the judiciary, thus ensuring a comprehensive perspective:

Estonia is an advanced model of e-government and e-justice, recognized for its almost complete integration of online public services (100% public services accessible online) and robust infrastructure (digital identity for every citizen, X-Road interoperability platform, etc.) (E-Estonia, 2024). The Estonian case study makes it possible to identify good practices and the maximum benefits that digitalisation can bring to the courts.

Germany offers the prospect of a large-scale traditional judicial system, which has started the digitalisation process more slowly, but which in recent years has implemented significant legislative and technological reforms (e.g. mandatory electronic communication for lawyers from 2022, introduction of the electronic court file gradually until 2026) (CMS, 2023). The case of Germany highlights the challenges of a complex system in adapting to the digital age, as well as the importance of the regulatory framework in this transition.

Romania illustrates the situation of a system in the process of digitization, which has made progress (implementation of electronic file solutions, online case law portals, the use of electronic signature in certain procedures) and which benefits from European support (through funds and recommendations) for modernization, but which still faces infrastructure and resistance to change problems (Szentpáli-Gavallér, 2024). The Romanian case study allows highlighting both the beneficial effects and the perceived obstacles and risks, including on the constitutional rights of citizens (Bănică, 2020).

The concrete method used was the comparative analysis of the legal and institutional framework in the three countries, corroborated with the analysis of doctrinal positions and empirical studies on the effects of judicial digitization. Elements such as: legislative changes adopted to allow electronic procedures (e.g. rules on digital signatures, tele-court hearings), the existing judicial IT infrastructure (e.g. e-File system in Estonia, electronic case management systems in Germany and Romania), the level of adoption of digital solutions (proportion of proceedings managed online, services offered to litigants via the internet) and lawyers' perspectives/attitudes towards them changes (including ethical and rights protection aspects).

For the ethical and fundamental rights dimension, the methodology also included an analysis of the guiding principles formulated by relevant bodies (such as the European Ethical Charter on the use of artificial intelligence in judicial systems, adopted by CEPEJ in 2018, and the case law or recommendations of the European Court of Human Rights on due process in a digital context). Reports by professional organisations (Councils of the Magistracy or associations of judges and lawyers) reflecting ethical concerns related to the digitalisation of justice were also considered.

It should be emphasized that, given the rapidly evolving nature of the subject, the analysis has an exploratory and descriptive character, synthesizing the information available until 2024-2025. No field research or sociological studies were carried out, but data from existing surveys and questionnaires were integrated (e.g. a 2020 CCJE questionnaire on the use of video sessions in courts to which judges from Romania, Germany, etc. also responded) (Sanders, 2021). The methodological limitations are related to the dependence on secondary sources; however, the triangulation of legal, statistical and doctrinal sources

provides a sufficiently robust basis for drawing conclusions on the impact of the digital transformation on the administration of justice in Europe.

3. RESULTS

3.1. Normative challenges of the digitization of justice

A first stage of analysis is the normative frameworks necessary for the integration of digital technologies in the judicial system. Effective digitalisation cannot take place in a legislative vacuum – it is essential that laws and regulations recognise and facilitate the use of electronic means in judicial proceedings, while ensuring the protection of parties' procedural rights. At the European level, the European Commission proposed as early as 2020 a "legislative toolbox" for the digitalisation of justice, stressing that the use of technology must be carried out in full respect of fundamental rights and the principles of the rule of law (European Commission, 2020). Relevant initiatives include the eIDAS Regulation (Regulation (EU) No 910/2014) on electronic identification and trust services, which provides the legal basis for the recognition of qualified electronic signatures and electronic seals in all Member States – crucial for the validity of documents filed online with courts. The e-CODEX Regulation was also proposed in 2021, which would institutionalize the IT system for secure communication in cross-border judicial proceedings (European Commission, 2020), facilitating the electronic transmission of applications and evidence between courts in different countries.

In practice, each Member State has had to adapt its national legislation to allow for electronic procedures. An eloquent example is Germany, which, through the 2013 Act on the Promotion of Electronic Legal Communications, amended the Code of Civil Procedure (ZPO) to introduce the use of electronic documents and electronic evidence in courts (CMS, 2023). A key element was the creation of the electronic mailbox for lawyers (in German, besonderes elektronisches Anwaltspostfach – beA), a secure system launched in 2016. Subsequently, Germany required by law that, as of January 1, 2022, all lawyers and public authorities must submit documents exclusively in electronic format, except in situations of technical force majeure (CMS, 2023). This obligation (provided for in Art. 130d ZPO) represents a major step in the normalization of digital communication with courts and was accompanied by provisions on the probative value of electronic documents: if an electronic document is signed with a qualified electronic signature, it has the same probative value as a document under a handwritten signature (CMS, 2023). Moreover, documents issued by public authorities in electronic format enjoy the presumption of authenticity specific to official documents (CMS, 2023). All these legislative changes in Germany have ensured legal equivalence between traditional and digital procedural acts, removing uncertainties regarding, for example, the acceptability of an email or PDF file as a means of filing a legal action.

However, the German case also highlights temporary regulatory limitations: although lawyers are obliged to communicate electronically with the courts, the German courts themselves are not yet required by law to communicate exclusively online with the parties (at least until the deadlines for full implementation) (CMS, 2023). Basically, some courts can continue to send summons or judgments on paper until the transition is finalized. In addition, although many German courts have already implemented the electronic file system (e-Akte), it will only become uniformly mandatory from 1 January 2026 (according to Art. 298a ZPO) (CMS, 2023). This transition period shows that regulatory adaptation comes gradually, allowing the judiciary to get used to the new procedures and to solve any secondary technical or regulatory problems (such as electronic archiving standards, backup procedures, etc.).

In Romania, regulatory efforts to digitize justice have been more fragmented until recently but have accelerated under the pressure of the COVID-19 pandemic and the objectives assumed through the National Recovery and Resilience Plan (PNRR). The Romanian Code of Civil Procedure has been amended to allow for videoconference hearings in certain situations, and the related legislation has been adapted to recognise digitally signed electronic documents in interaction with the courts (the High Court Electronic Record Act and some courts of appeal) – although practical implementation varies. An interesting aspect of comparative law highlighted by the literature is that, in Romania, as in other Eastern European countries, the law requires the consent of the parties to conduct court hearings by videoconference (in the absence of the express consent of the parties, the use of this alternative procedure could be considered a violation of the right to a fair trial) (Sanders, 2021). Therefore, the Romanian regulatory framework tends to protect traditional procedural rights, allowing technology an auxiliary and voluntary, rather than mandatory, role. This precautionary approach reflects a legitimate concern to guarantee the principles of adversarial and orality – the Romanian legislator wanted to avoid the situation in which a party is forced to participate in an online trial against its will, for fear that it would not benefit from the same conditions as in a physical courtroom.

At the same time, Romania has also adapted its national strategies to integrate European digitization objectives. The National Strategy on the Digital Agenda and the Strategy for the Development of the Judicial System (Strategy for the Development of the Judicial System 2015-2020 and the recent one 2022-2025) mention digitalisation as a priority direction, including measures such as the development of an IT system for case management (modernised ECRIS), the scanning of court archives, the implementation of the case law portal with the anonymisation of personal data and the interconnection with the European e-Justice portal. According to a 2024 study, Romania's strategy emphasizes the need to adapt legislation to digitalization, including planning Romania's participation in European projects on the anonymization of court decisions (for

publication as open data) and exploring the use of artificial intelligence in justice, within the e-Justice Action Plan 2019-2023 (Szentpáli-Gavallér, 2024). This commitment suggests that, at the regulatory level, Romania recognizes the challenges (the need to protect personal data in published judgments, where anonymization is essential for GDPR compliance) and seeks to address them through pilot projects and European cooperation.

At the European Union level, it is also worth mentioning the EU Charter of Fundamental Rights and data protection legislation (General Data Protection Regulation – GDPR) which provide an imperative framework in any digitalization approach. Digital records management involves the storage and processing of large volumes of sensitive personal data (names of parties, CNPs, data on criminal cases, etc.), which means that cybersecurity is a first-rate legal requirement. Any forensic IT architecture must ensure the secure authentication of users (e.g. the use of digital identity – electronic identity card or digital signature – for access to files), audit logs for accesses, encryption of transmissions and compliance with data retention and deletion rules. Normatively, the challenge for legislators was to balance the transparency of justice with data protection: the publication of court decisions online increases transparency and access to jurisprudence but requires the anonymization of personal data so as not to violate the right to privacy (Bănică, 2020). In this regard, it should be noted that many states (including Romania) have adopted rules on the anonymization of the names of the parties in the decisions placed on public portals, and at EU level, common standards of judicial data are being discussed to reconcile free access with confidentiality.

The analysis of the regulatory challenges indicates that the digital transformation of justice requires complex but feasible legislative updates: from adapting procedural codes to recognise digital tools (such as online submission of applications, remote hearings), to ensuring the legal value of electronic documents and up to creating the premises for digital judicial cooperation between states (e.g. the e-CODEX framework). Countries that have made the most progress (such as Estonia) have benefited the early existence of an enabling legal framework – in Estonia, electronic identification and digital signatures have been fully legally recognised since the 2000s, and legislation has been rapidly adjusted to allow all communications between parties and courts to be made electronically (E-Estonia, 2024). Countries such as Germany have adopted a gradual path, first legislating optionality, then the gradual obligation of electronic means. Romania and other states in the region have started more slowly, but under the impetus of the pandemic and the EU agenda, they have gradually aligned their laws, emphasizing the simultaneous guarantee of traditional rights (e.g. the condition of consent for video-sessions as a security measure of the right to defence). Overall, the European and national regulatory framework is evolving towards the institutionalization of e-justice, the main

challenge being that this legal evolution is always one step ahead of (or at least in step with) the technological evolution, avoiding the legislative vacuum or the conflict of norms with the new digital realities.

3.2. Normative challenges of the digitization of justice

In addition to legislative adjustments, the digital transformation of the judiciary also entails institutional challenges. Court administration – i.e. the way cases are handled, hearings are scheduled, staff interact with the public – is changing significantly with the introduction of new technologies. The experiences of European states show that the success of digitalisation depends to a large extent on institutional capacity: adequate technical infrastructure, digital skills of staff, reconfigured working procedures and an organisational culture open to innovation.

A positive example is Estonia, where judicial institutions have been prepared and reorganised to make the most of digital opportunities. Since the 2000s, Estonia has invested heavily in e-government infrastructure, and the judiciary has been no exception. The central e-File system in Estonia is the core of the digital administration of justice: it connects all courts with prosecutors' offices, police, prisons and other relevant institutions, enabling the electronic circulation of data and documents in an integrated way (E-Estonia, 2024). Basically, when a file is entered into the system, all relevant parties can access the allowed information about the case, updates are made in real time, and the workflow (issuing summonses, transmitting the minutes of the hearing, communicating the judgment) is electronically automated (E-Estonia, 2024). The once-only principle, followed by the system's architecture, ensures that data entered once (e.g. parties' data) is automatically reused throughout the judicial chain, avoiding redundancy and errors. Also, each citizen or lawyer, using their digital identity (ID-card or Mobile-ID), can file actions online and consult the status of their file 24/7 through the public portal e-Justice (E-Estonia, 2024). The institutional effect of this system is dramatic efficiency: paper or over-the-counter communications have been replaced by electronic interactions, saving time and resources. It has been reported, for example, that in Estonia questions or requests for information to courts are answered in an average of 1.5 seconds via the digital system, compared to 20 minutes in the previous analogue regime (E-Estonia, 2024). Therefore, it is not surprising that Estonia has some of the shortest process resolution times in Europe – a benefit partially correlated with the intensive use of technology, according to data from the European Commission (E-Estonia, 2024).

To achieve these performances, institutional challenges had to be managed through exemplary change management in Estonia. Estonian courts, under the coordination of the Ministry of Justice and with the support of the Register Information Systems Centre (RIK), have developed new working procedures

adapted to the digital environment. Protocols have been established for the electronic signature of judgments by judges (which can be done either with a qualified digital signature or – where needed – by physically printing and signing, depending on the situation) (E-Estonia, 2024). Clerks and auxiliary staff have been retrained to use computer systems, and the way of storing files has shifted from physical archives to secure digital databases. A specific challenge was ensuring interoperability: Estonia solved it through the X-Road platform, which ensures the exchange of data between different institutions in a standardized and secure was. Thus, courts can check data from the population register, criminal records, commercial registers, etc. directly through the system, without paper or separate applications – which greatly shortens the time for obtaining administrative evidence. This example shows that institutions can be reorganised around the digital flow of information, with tangible benefits such as shorter proceedings and increased transparency (parties always have online access to the status of their case).

In contrast, larger, decentralised judicial systems, such as Germany's, have faced institutional challenges of a different kind. Germany, with a very large number of courts and a pronounced federalism, had to coordinate digitization efforts at the level of the Länder and the federal government. The challenge was to ensure the compatibility of IT systems between the Länder, so that a document sent electronically in one Länder can also be read and processed by the court of another Länder (especially relevant in domestic cross-border appeal or enforcement cases). The solution was the development of common standards (e.g. the XJustiz standard for legal data exchange) and the involvement of the IT Council for Justice (IT-Planungsrat) which coordinates interregional digital projects. At the same time, the introduction of the electronic file (e-Akte) involved a huge administrative work of scanning and converting the existing archives, as well as creating temporary parallel infrastructures (hybrid, paper and electronic system until the complete transition). German judicial institutions have invested in secure data centers for storing electronic files, with geographical backup, and in equipping courtrooms with equipment for videoconferencing and electronic display of evidence. An obstacle reported in the literature is the resistance to change of some users – certain judges or lawyers, accustomed to physical file volumes, have shown reluctance to use exclusively screens for case management. In Germany, the need for continuous training has been highlighted: IT training courses have been organised for magistrates and staff, manuals for using the new systems have been developed and an accommodation period has been offered (until 2026, judges can also work on paper if they wish, although they are encouraged to use e-Akte). This institutional flexibility is part of the strategy of gradual change, avoiding sudden disruption of judicial activity.

Romania is also facing its own institutional challenges. A recent study highlighted that although important progress has been made in recent years in terms of access to legal information and the implementation of IT systems, many initiatives have encountered barriers related to adoption, quality, legislative framework and consistency (Szentpáli-Gavallér, 2024). Romanian judicial institutions – courts, prosecutors' offices – have implemented systems such as ECRIS (case management system) and have developed the electronic file module that allows parties to consult the documents in the files online, but the effective use of these facilities is not uniform. A major challenge is the availability of IT infrastructure: not all courts (especially small ones, judges) have sufficient equipment or high-speed internet connections to hold online hearings or simultaneous access of many users to electronic files. Also, the workload and insufficient number of IT staff is an impediment – the administration of electronic systems requires specialized programmers and technicians, and the courts often do not provide sufficient posts in this regard. In recent years, the Romanian Ministry of Justice, financially supported by the EU, has initiated projects to strengthen the infrastructure (purchase of servers, videoconferencing equipment, courtroom computers, etc.), but their implementation at local level may be uneven.

Another institutional aspect is the training of human resources. Successful digitalisation requires judges, clerks, lawyers, auxiliary staff to acquire appropriate digital skills. In Romania, there was a need to expand the training of magistrates and justice personnel in the direction of using technology in the courts (Bănică, 2020). Institutions such as the National Institute of Magistracy and the National School of Clerks have started to include in their training programs modules of legal informatics and the use of electronic file applications. However, the literature points out that the digitization process is still in its early stages, with many efforts focused on the electronic duplication of existing procedures rather than on fundamentally rethinking the judicial workflow (Szentpáli-Gavallér, 2024). In other words, Romanian courts mostly use computers to draft and communicate documents, but the way of working remains like the paper era (the same procedural steps but intermediated by e-mail or pdf). This situation is characterized as partial digitization, without full organizational transformation.

Studies highlight that, in order to move to the next level, Romanian judicial institutions will have to approach digitalization as a process of structural change. This involves: better inter-institutional coordination (between courts, the Ministry of Justice, the SCM, IT providers), the sustainable allocation of financial resources (including from the national budget, not just EU funds, for system maintenance), as well as the involvement of end-users in the design of solutions (judges and lawyers must be actively consulted when developing platforms, in order to meet real needs). A positive aspect is that, according to the

EU Justice Scoreboard 2023, Romania ranks in the middle of the EU ranking in terms of judicial digitization indicators, which suggests that it is neither at the bottom nor among the leaders (Szentpáli-Gavallér, 2024). For example, there is the possibility of submitting documents online in civil and administrative proceedings and the possibility of the parties accessing electronic files for some courts, but not in all cases and not uniformly across the country (European Commission, 2022). This intermediate position indicates potential for improvement, but also the existence of a base from which to build.

Another type of institutional challenge, valid in all countries, is to maintain the resilience and security of judicial services in the digital environment. Judicial institutions need to adapt their business continuity plans to risk such as IT failures, cyberattacks or power outages. In Estonia, for example, investments have been made in blockchain backup solutions to ensure the integrity of judicial data (the KSI blockchain timekeeping project) and in periodic cyber incident response simulations (E-Estonia, 2024). In Germany, redundancy standards have been called into question – courts are required to keep backups of electronic files and have procedures in place for offline operation if systems fall apart. Romania, in the PNRR, provided for the creation of a secondary data center for justice, precisely to improve the resilience of the current infrastructure (which had been criticized as obsolete and vulnerable to interruptions). Therefore, from an institutional point of view, digitalization also brings with it the requirement to develop new administrative functions: IT security experts, disaster recovery procedures, periodic updates of equipment and software – all of which must be integrated into the way the judicial system works.

Institutional challenges in the digitalisation of justice include ensuring the appropriate technological infrastructure, managing human and organisational change, as well as guaranteeing security and interoperability. The Estonian experience shows the maximum benefits that can be achieved when these challenges are overcome faster procedures, reduced costs, increased access for citizens. The German case shows the importance of long-term strategic planning and gradual implementation, with a focus on compatibility at national level. The Romanian situation reveals the need to strengthen investments and training, in order to move from simple pilot projects to a substantial administrative transformation. At European level, the Commission and the Council have supported institutional efforts through funding (the Cohesion Fund and the RRF, which make the allocation of money conditional on reaching milestones related to the digitalisation of the courts) (European Commission, 2022) and through technical cooperation mechanisms (networks of experts, exchange of best practices through the European Network of Councils for the Judiciary, the Justice programme, etc.). This is shaping up a trend for European judicial institutions to become more agile, interconnected and service-oriented to citizens

online, although the pace and effectiveness of these transformations still vary significantly from country to country.

3.3. Ethical and deontological challenges in the digitalization of justice

The digitalisation of the judiciary not only brings technical or legal problems, but also a number of ethical challenges, which require careful reflection so as not to affect the fundamental principles of the act of justice. The main ethical aspects include ensuring the right to a fair trial under the conditions of new technologies, protecting fundamental rights and freedoms (in particular privacy and personal data), as well as maintaining impartiality, non-discrimination and human control in the context of the possible use of artificial intelligence in the judicial field.

A first aspect is the right to a fair trial (Article 6 of the European Convention on Human Rights) and how it is guaranteed in digital proceedings. The videoconference hearings raised questions about the effectiveness of the parties' participation and the perception of impartiality. How can the judge assess the credibility of a witness through a screen? Does the accused have the right to sit with his lawyer in the same room during an online criminal trial? Such questions have been intensely debated with the expansion of remote hearings during the pandemic. Many states have imposed procedural safeguards: in some jurisdictions (such as Romania, Austria, etc.), videoconferencing is allowed only with the consent of the parties, considering that the absence of consent could prejudice the right to a public and oral hearing (Sanders, 2021). The courts were warned to ensure the confidentiality of lawyer-client communication during video sessions (through separate chat channels or technical breaks), so that the right to defence is not compromised. A comparative analysis at the Council of Europe level revealed that, where videoconferencing was used, judges identified both advantages (e.g. avoidance of delays caused by the impossibility of physical appearance, reduction of the resolution time) and disadvantages (difficulty in questioning witnesses, technical problems that may interrupt the hearing, risk that the parties will not perceive the solemnity of the act of justice in the virtual environment) (Sanders, 2021). A Romanian judge, expressed an optimistic view, arguing that the potential drawbacks of online hearings can be overcome and that it is up to judges to find ways for "remote justice" to have a human face and be prompt (Sanders, 2021). This perspective highlights the importance of the ethical attitude of the judge himself: even with interposed technology, the judge must ensure that the parties feel heard, that the procedure does not become purely formal or rushed, and that the dignity of the trial is maintained.

Another major ethical concern is related to equality of arms and non-discrimination. The digital divide can create new inequities: people or lawyers with low digital skills, or without easy access to the internet and equipment, can

be at a disadvantage compared to those who master technology. In the context of justice, this could mean difficulties in filing actions online, consulting electronic files or participating in videoconferences. For this reason, many states have maintained traditional alternative channels in parallel with digital ones, so as not to exclude anyone. In Germany, although lawyers must communicate electronically, litigants without representation (natural persons) can still submit applications on paper if they do not have the technical possibility to use the electronic portal. Similarly, Romanian courts accept both documents with a handwritten signature (scanned and sent by email) and documents with a qualified digital signature, not wanting to reject applications for purely technical reasons. Ethically, the judicial system has the obligation to be inclusive and ensure access to justice for all categories of the population, which means that digitization must be accompanied by digital literacy efforts and possibly assistance (guides, information centers) for those unfamiliar with the new procedures.

The protection of personal data and privacy is another essential ethical dimension. Court files contain sensitive information – from medical data in a malpractice case, to financial details in a commercial litigation, or to protected addresses and witnesses in criminal cases. The digitization of these files involves storing data on servers and possible online access, increasing the risk of security breaches or misuse. Cases of hacking of public institutions are not theoretical; That is why digital justice must adhere to the principles of privacy by design. Ethically, it becomes imperative that only authorized persons can access the data of a file and that the parties are informed how their data is used. In Europe, GDPR rules require courts (as data controllers) to protect data and report potential security breaches. The additional challenge in justice is that the balance must be maintained with the publicity of court hearings and with the transparency of justice. The publication of judgments, for example, is considered beneficial (it increases the predictability of the act of justice, allows monitoring by society), but it requires the anonymization of names and other elements to protect the people involved (Bănică, 2020). Romania intends – as mentioned – to participate in automatic anonymization pilot projects, recognizing that this is both a topical ethical and technological issue (Szentpáli-Gavallér, 2024). Moreover, data security also involves the integrity of digital evidence: the risk of digital documents being falsified has already arisen (e.g. changing the content of an electronic file without leaving visible traces). Courts must be vigilant to such risks – digitization brings "the emergence of new risks in the process, which imply increased vigilance of the court, for example the risk of falsification of data in files" (Bănică, 2020). Ethically speaking, we are faced with a technological due diligence obligation: judges and lawyers must be educated to verify the authenticity of electronic evidence (digital signatures, timestamps,

electronic chain of custody), just as in the past they learned to detect paper forgeries.

A separate discussion is needed regarding artificial intelligence (AI) in the judicial system, an advanced component of the digital transformation, which raises perhaps the most complex ethical dilemmas. The use of AI can range from modest tools (e.g. jurisprudential search engines that suggest solutions from previous practice to judges) to potentially intrusive applications (algorithms that assess the risk of recidivism to influence parole decisions, or even "virtual judges" for simple cases). The Council of Europe, through CEPEJ, adopted in 2018 the first European Ethical Charter on the use of AI in judicial systems, precisely to establish clear limits and principles (Council of Europe, 2018). This Charter sets out five fundamental principles that must be respected in any use of AI in justice:

The principle of respect for fundamental rights – ensuring that the design and implementation of AI tools are compatible with human rights (an automatic conviction algorithm would violate the right to a fair trial; or a facial recognition system used without regulation would violate the right to privacy) (Council of Europe, 2018).

The principle of non-discrimination – preventing the development or amplification of any discrimination between individuals or groups through the use of AI (Council of Europe, 2018). In practice, this means that if an algorithm is used, it must be avoided that it systematically disadvantages a group (it has been discussed that certain risk assessment algorithms in the US were biased against racial minorities, which would be unacceptable in Europe).

The principle of quality and security – ensuring that the processing of judicial data and decisions by algorithms is done with quality data (certified, verified) and in a secure technological environment (Council of Europe, 2018). An algorithm that learns from court decisions must be fed with accurate and representative data, otherwise its conclusions may be erroneous or dangerous.

The principle of transparency, impartiality and fairness – the methods of data processing by AI must be accessible and understandable, and their use externally audited (Council of Europe, 2018). In other words, the algorithms used in justice must not be "black boxes"; Parties should know whether a decision was assisted by an algorithm and be able to understand its underlying logic. By default, judicial decisions should remain motivated by a human being, even if software has provided a suggestion.

The 'under user control' principle – ensuring that AI solutions are used as tools for human decision-makers, without substituting for the final human decision. CEPEJ stresses that a prescriptive approach to AI must be avoided; users (judges, clerks) need to be informed, have the choice and control over how they use an AI tool (Council of Europe, 2018). In simple terms, the decision

belongs to the judge, and the algorithm can only assist him – never the other way around.

These ethical principles, accepted at European level, guide the debate on the introduction of AI in the judiciary. In practice, most Member States are only at the level of pilot projects or limited use of AI (such as algorithm-based random case allocation systems, or tools for automatic anonymisation of documents). Estonia has even explored the bold idea of a "virtual court" for low-value commercial disputes, where software could propose a solution that becomes binding if the parties do not challenge it before a human judge. However, this idea has sparked heated ethical discussions, invoking the risk of violating the right to an independent and impartial tribunal – a computer program is not "independent" in the constitutional sense nor imputable from the point of view of responsibility. So far, no proper "AI judge" has been implemented anywhere in Europe, and it is unlikely to happen without major legislative changes. Germany and other countries have used AI more in court administration (predicting the future volume of cases and allocating resources) and less in making concrete judicial decisions, precisely out of ethical precautions.

Even simpler digital tools raise ethical issues. The use of social networks by the courts (for communication with the public) was discussed: on the one hand, it can increase the accessibility of information (announcing postponements, public hearings), on the other hand, there is the risk of the appearance of lack of sobriety or inappropriate comments that can undermine the judicial authority. Judges' codes of ethics must also extend to online conduct – judges communicating by email or participating in virtual hearings must show the same level of professionalism as in the physical courtroom. The human touch in justice remains crucial: "in the rush to align with the digital age, the human component risks pale in front of the benefits of artificial intelligence", adaptation to new technologies being demanded "at any cost" by society and the state, sometimes without providing the necessary resources for a smooth transition. This ethical warning suggests that the digital transformation must not degrade the fundamental values of justice: empathy, conscientious deliberation, procedural guarantees. Justice cannot become excessively automatic and "dehumanized", because it would lose its legitimacy.

The ethical challenges related to the digitization of justice require a principled approach. It is imperative that the implementation of technology be accompanied by safeguards to maintain the fairness of trials and the dignity of the act of justice. Principles such as transparency of algorithms, human control, non-discrimination and respect for privacy must be inscribed in the "DNA" of any digital solution adopted by the judicial system. Both decision-makers and legal professionals have an ethical responsibility to ensure that digital tools serve justice, and not the other way around – that is, justice does not become subjugated by technical constraints. In Europe, where the rule of law and human

rights are core values, the digitalisation of justice will be judged not only by the efficiency achieved, but also by the extent to which it succeeds in strengthening or at least preserving existing ethical and fundamental rights standards.

4. DISCUSSIONS AND CONCLUSIONS

The impact of the digital transformation on the administration of the European judicial system is proving to be profound and multidimensional. The present analysis highlighted that digitalization, although it brings undeniable benefits in terms of efficiency, accessibility and cooperation, also generates significant challenges in the normative, institutional and ethical spheres. The integrated discussion of these aspects allows us to outline an overview of how the digitization process can be optimally managed in the future, so as to serve the interests of justice and society.

A first major gain of the digital transformation, underlined by the Estonian example and beyond, is the increase in procedural efficiency. Case resolution time can be significantly reduced by eliminating bureaucratic delays (postal correspondence, unnecessary trips to court) (E-Estonia, 2024). Access to justice is improving, litigants can submit applications online at any time, check the status of the case free of charge and even participate in remote hearings if their presence would otherwise be difficult. This is in line with the European Commission's vision that justice must keep pace with the development of the digital society, so as not to become an opaque structure and backward from the rest of the public services (European Commission, 2020). In addition, digitalisation offers opportunities for more efficient cross-border judicial cooperation: tools such as e-CODEX, secure communication platforms between authorities or common databases (interconnected criminal records or insolvency registers) facilitate the application of EU law and mutual recognition tools.

However, the critical discussion reveals that the benefits are not achieved automatically, and the way of implementation makes the difference between success and relative failure. A key point is political and strategic commitment. Countries that have achieved a high level of judicial digitalisation (such as Estonia) have benefited from a clear strategic vision and consistent government support for e-government. On the other hand, where digitalization was perceived as an isolated project of the justice system, unrelated to the general e-government efforts, progress was slower. Romania addresses the digitization of justice in the context of the digital transformation of the entire public sector, which is an important step – the PNRR and the Digital Agenda include components dedicated to justice, integrating it at the national level.

Coordination at European level also remains crucial. Large differences between states (northern Europe and some eastern countries move faster than others) can create an uneven landscape. The EU, through tools such as the EU Justice Scoreboard, highlights these differences and encourages the exchange of

best practices. Moreover, by linking FRR funding to achieving digitalisation targets, the EU is putting positive pressure on Member States to act (European Commission, 2022). This mechanism proves the awareness that the digitization of justice is not only an internal matter of the states but also has a European dimension (in the context of the functioning of the single market, of free movement – decisions and procedures need to be easily accessible and enforceable across borders).

The discussion on the normative dimension suggests a balance: on the one hand, uniform rules are needed at EU level to ensure interoperability (mutual recognition of electronic documents, common security standards), on the other hand, the details of implementation remain at the discretion of the states, which allows adaptations to the local context (principle of subsidiarity). European law is expected to evolve in the future as well – the draft Artificial Intelligence Regulation (AI Act) is likely to set special requirements for AI systems used in the public sector, including justice, as high-risk applications requiring strict conformity assessments. The adoption of the AI Act would complement the already existing ethical framework (CEPEJ) with binding legal force, which would be a step forward in the ethical legislation of digitalization.

From an institutional and management perspective, the discussion highlights the importance of the human factor and leadership in justice. Technology, no matter how advanced, is just a tool; Success depends on how people in the system – judges, clerks, lawyers – accept it and integrate it into daily practices. The organisational culture of the courts must evolve towards openness to innovation, and this can be achieved by involving innovative judges (so-called early adopters can become ambassadors of change), recognising efforts (prizes or incentives for courts adopting pilot solutions) and, last but not least, by demonstrating positive results. If staff see that a new system makes their work easier (searching for a file takes seconds instead of hours in the physical archive), reluctance decreases. On the other hand, if the implementation is flawed or the system is going slowly, scepticism grows. Therefore, rigorous testing and piloting are essential before large-scale releases, as well as having prompt technical support in place to resolve issues.

Another aspect discussed is the long-term sustainability of digitalization. Once the enthusiasm of European funds and initial projects has passed, the systems will have to be maintained, updated and possibly replaced with technological progress. That means multi-year budget planning and prioritization. It is possible that in the medium term, the costs of IT in the judiciary will increase, but these costs should be seen as necessary investments for an essential public service. In fact, economic studies cited by the European Commission argue that the efficiency of the justice system has a direct impact on the economy: where justice is faster and more predictable (which correlates with digitalization), companies are more willing to invest, lending increases, and

GDP can be positively influenced (European Commission, 2022). Thus, governments have reason to consider the digitalisation of justice a strategic priority, not just an internal administrative matter.

From an ethical point of view, the discussions show that digitalization must be a citizen-centered process. The ultimate goal is not "technology for technology's sake," but more accessible and just justice. It would be a paradox if digitalization, meant to improve the service of justice, led to the distancing of justice from the citizen (through digital alienation or algorithmic opacity). That is why the focus on transparency and accountability is vital: every innovation (whether it is an online filing portal or an AI system) should be explained to the public, showing how it works, what benefits it brings and what guarantees there are. Collaboration with civil society and academia can be useful to assess ethical impact – human rights organisations or professional associations may be invited to participate in impact assessments when a new technology is introduced to the judiciary.

The impact of the digital transformation on the administration of the European judicial system is revealing we see a new paradigm of justice emerging – e-justice or e-justice – which promises more efficient procedures and extended access, but which also requires vigilance to preserve the core values of the act of justice. The normative, institutional and ethical challenges analyzed in this paper are not insurmountable obstacles, but problems that can be solved through well-thought-out public policies, European cooperation and ethical reflection. Europe can be a global leader in shaping quality digital justice, combining technology with deep respect for the rule of law. The comparative experiences of Estonia, Germany, Romania (and other countries) show various ways forward and highlight the importance of context: there is no one-size-fits-all solution, but there are common principles – legality, efficiency, accessibility, equity – that need to be achieved everywhere.

In the long term, we can expect the courts of the future to operate in an increasingly digitized way: physical files will become the exception, artificial intelligence will help manage the volume of information, and citizens will be able to solve many of their legal problems online. The generational challenge for judicial systems is to make this transition without abdicating their fundamental mission – that of delivering justice, in the name of law and justice, for every person. Digital transformation, as shown, can and must be the ally of this mission, not an end in itself. Through an interdisciplinary approach, the European judicial system can enter the digital age by preserving what is essentially human in the act of justice and enhancing its ability to serve the public.

In the light of the above, it is necessary that decision-makers and justice professionals continue to work together – at national and European level – to overcome these challenges. Continuous updating of the regulatory framework,

institutional strengthening through investment and training, as well as strict compliance with ethical principles will be the pillars on which the future of digital justice in Europe will be based. Only in this way will the impact of the digital transformation be a positive one, strengthening citizens' trust in the justice system and affirming democratic values in the information society of the 21st century.

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