EUROPEAN UNION-BRAZIL EXCHANGE OF EXPERIENCES ON E-JUSTICE

FINAL REPORT

CNJ CONSELHO NACIONAL DE JUSTIÇA

Dialogues EUROPEAN UNION BRAZIL

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FOREWORDS

We are pleased to announce this work as a result of a prolific series of dialogues, technical meetings and reports that were developed within the "European Union-Brazil exchange of experiences on e-Justice" initiative, held in coordination between the European Union Delegation in Brazil and the National Council of Justice, with the support of the EU-Brazil Dialogues Support Facility.

Similar to the revolution started with the invention of the Gutenberg printing press, we are witnessing an increasing trend in digitalization of the processes and documents that affect not only productive sectors, business and entrepreneurship markets, but also public institutions that are persistently seeking to rise the quality of citizen-centered public services. This evolution impacts on how the information flows and is disseminated around the globe, causing economies of scale and increasing the speed of communication and, therefore, creating new opportunities, businesses and landmarks.

When we talk about new technologies like artificial intelligence, it is heavily dependent upon a large dataset of labeled information to train machine learning models. When we think of adopting a block chain infrastructure, it relays in distributed ways to allocate and provide digital information. Furthermore, we can't conceive a big data analysis without digitalized information aggregated in large data warehouses. These technologies, as we perceived in this final report, can only be possible in a context that has adopted and inserted digitalization processes in its institutional culture. Therefore, we must consider digitalization as the basic infrastructure of the 21th century. The investment and allocation of resources in this area will benefit our present reality and also future generations.

During the technical meetings and assessments that were held in institutions from Estonia, Austria, Germany and Brazil, the common aspect that we have perceived is the increasing efforts to digitalise judicial procedures, to use informational frameworks to manage and catalog electronic papers and the care with user interface and to optimise systems in order to make them user-friendly to end users. Its impacts could be estimated at the present, but the core benefits will just be completely felt in the long run as this digitalization will surely be the basic foundation to more advanced initiatives that have already been foreseen.

The European Union approach in the subject of digitalization is largely oriented in respect to human rights with notable ethics and human-oriented paradigms, this being the main insight and strength that we could identify. Regarding the Brazilian side, there is an unprecedented scalability of digitalization services as a need to deal with the continental extension of the national territory and the large number of citizens in contrast to the reality of smaller countries in the world. And these peculiarities are the profitable result that we obtained from this EU-Brazil Dialogues action, that materialise a joint effort to exchange best practices and identify insightful projects in an international and multilateral perspective.

It is worth it noting that this final report took an unprecedented profile, considering not just the digitalization process itself, but the influence and benefits that can emerge in other social areas like environmental protection, human rights, imprisonment management and civil identification. This broad scope shows the importance of the theme for fields that are not

so commonly involved in technological processes. The social advances in current days must consider the impacts of digitalization as a matter of fact in human and civil rights agenda.

Based on empirical evidences and scientific research, this final report demonstrates that the two engaged partners, Brazil and the European Union and its Member States, are providing valuable contributions to increase the levels of digitalization and, in doing so, are releasing new landmarks and providing a conceptual infrastructure to the human evolution.

Justice LUIZ FUX
President of the National Council of Justice
President of the Supreme Federal Court

IGNACIO YBÁÑEZ
Ambassador of the European Union to Brazil

The "*European Union-Brazil exchange of experiences on e-Justice*" initiative was a noteworthy opportunity that both the National Council of Justice and the Delegation of the European Union in Brazil had to focus on strategic projects about digitalization and innovation on the Judicial branch that had been realised in the last years. As a truly bilateral dialogue, this report shows that both international partners have technological and methodological background to contribute to a fast-changing information-based world.

As a very large and diversified country, Brazil is one of the global leaders in lawsuits filled per year, also holding one of the heaviest caseloads per judge. In 2020, the 91 Brazilian Courts had 75 million pending lawsuits, considering 25,8 million as new cases filled in that year, totalizing 6.321 cases per judge. At the same period of time, 27,9 million were concluded.

This herculean task could only be done with the Brazilian e-Justice policies and technologies, that allowed a steady evolution from paper to digital starting in 2004, when the courts introduced the first digital case management system. In 2006, the first federal law about digital proceedings was enacted, which allowed the use of electronic means in the judicial procedures and the communication of judicial acts and documents. In 2013, the Electronic Judicial Proceeding system – PJE, became the official national software to manage court cases. In 2015, the rate of digitalization of new cases increased substantially from 56.3% to 96.9% in 2020, which demonstrated the impact of this kind of initiative, like the ones that will be shown in this report. This digitalization not only provides a benefit to the court itself, but for the society in general, as it reduces the expenses previously applied to paper supplies, and it also reduces the amount of human and manual tasks that were required to the procedural flow.

The Brazilian part of this report showed that initiatives like the Justice 4.0 program were designed to increase the rate of digitalization of Justice from different work fronts. One of these is the Judiciary's Digital Platform - PDPJ, a framework that allows the nationwide dissemination of microservices created by the local and regional courts of Brazil that encompasses a marketplace for applications and software, authentication and authorization protocols, unified taxonomical tables to classify judicial documents, and other integrations. With the COVID-19 pandemic, the efforts and needs of digitalization emerged with an unprecedented force, inducing a faster pace and need to not only digitalize, but to virtualize the communications. The "Digital Balcony"

project is an example of it, which consists of video conference services that provide the same functionalities that an in-person court desk would do. The 100% Digital Courts allowed remote video hearings and trials, accelerating the procedural flow and reaching parties, witnesses and lawyers that no other way of communication could provide, even, in some cases, surpassing the presential hearings accessibility.

Nowadays, even with this notable degree of digitalization, there are still fields to be worked on and technologies to be explored further to increase the efficiency and availability of the Justice systems. Technologies as machine learning models were successfully described in this report, approaching an ascending interest in these technologies in Brazil and European Union Member States. Many prolific cases and uses were mentioned, like the use of these models as a classification algorithm that reduces the need of human reading and work to categorise the lawsuit themes, and the use of natural language processing tools to anonymize parties names and characteristics for publication in official gazettes in Austria and Estonia. Also, the use of big data, block chain infrastructure, cloud storage and data science applied to Judiciary statistics were one of the notable sections of the report.

We expect that the forthcoming years will present a much easier and accessible Judiciary service, with features that could only be possible with the present work, relying on the shoulders of the work that the Courts are doing presently. This report showed the grandiosity and relevance of this theme to increase the degrees of our human societies, with respect to human rights and sustainability standards.

VALTER SHUENQUENER DE ARAÚJO
Secretary General of the
National Council of Justice

MARCUS LIVIO GOMES
Special Secretary for Programs, Research and
Strategic Management of the National
Council of Justice

I. EXECUTIVE SUMMARY

The present study is one of the main outputs of the action "European Union-Brazil exchange of experiences on e-Justice" of the European Union and Brazil, developed in the framework of the EU-Brazil Dialogues Support Facility. The project's main goal is to foster the EU-Brazil exchange of experiences on e-Justice policies, practices, technologies, and solutions, to improve access to justice.

Six concrete judicial projects[1] of the Brazilian National Council of Justice (CNJ) were chosen by the participants of the project to serve as a starting point and framework for the action comprising

a) fact finding missions of a CNJ-delegation to three EU member states (Austria, Estonia and Germany), facilitating first fact-findings *in situ* and establishing a fundament for long-lasting and fruitful peer-to-peer exchange;

b) a high-level international seminar of CNJ and EU experts in Brasília on 28/06/2022, presenting the results of the partnership to the public;[2]

c) and the present comparative report by the assigned EU expert (Gernot Posch) and the Brazilian expert (Christian Perrone), not only relying on secondary data research but, primarily, on the acquisition of first-hand data during the missions, talks with different stakeholders of the judiciary, and by means of a tailor-made survey on e-Justice and Artificial Intelligence in the EU.[3]

The six e-justice related projects of CNJ represented six areas of interest, which the exchange and research put its focus on: Digitalisation, big data (storage) solutions and statistics, Artificial Intelligence, biometrics, environmental as well as human rights matters.

1 See column 1 in the table below.

2 Available under https://www.youtube.com/watch?v=yk5PsbKUczA (morning session) and https://www.youtube.com/watch?v=K27TCYPr__k (afternoon session) [01/08/2022].

3 This study also benefited by the assistance of the Mr. Martin Schneider and the research assistants senior and junior respectively, Guilherme Stefan and Nina Desgranges.

Digitalisation

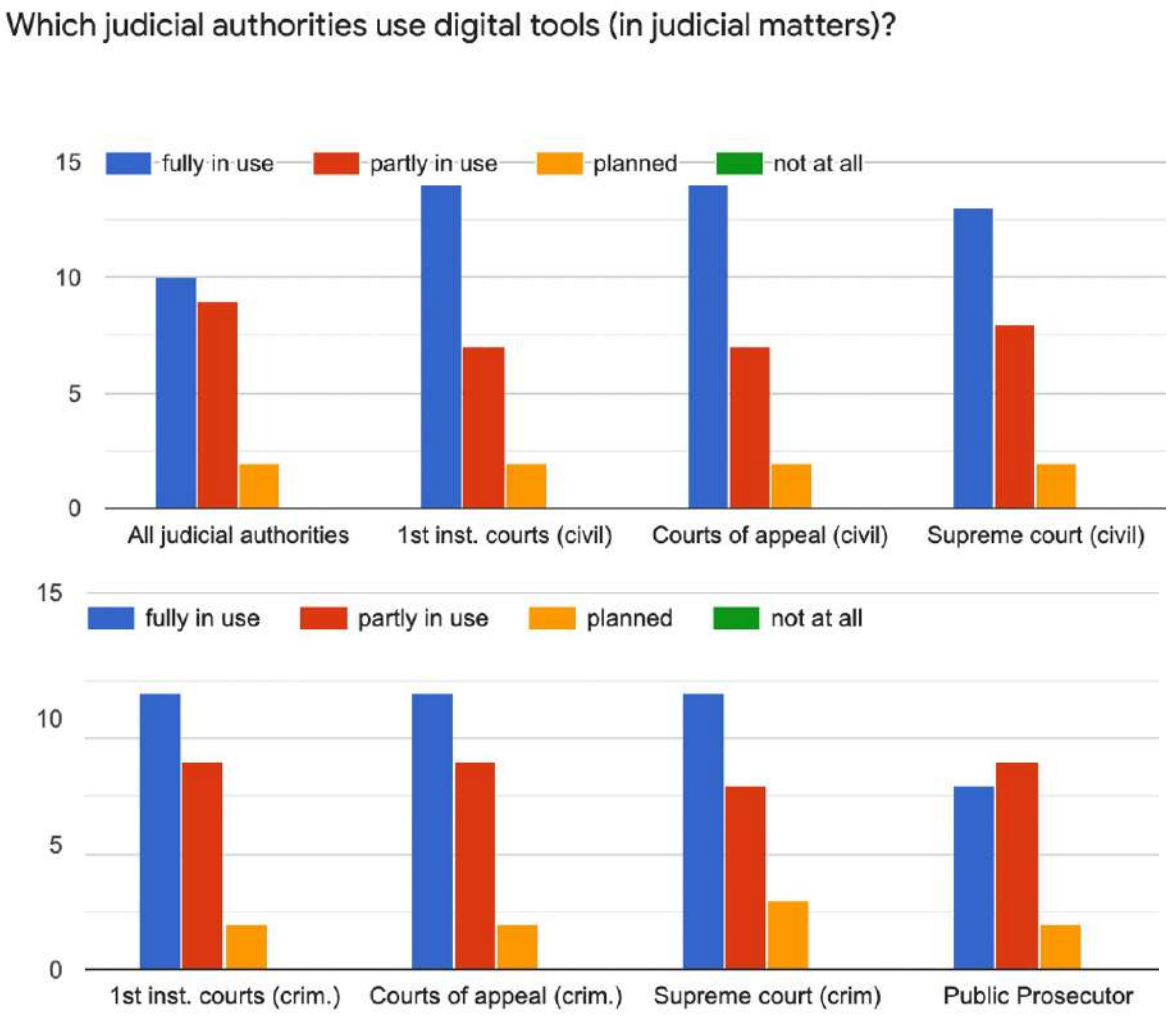
In general, one of the biggest issues the authors identified in the European Union member states, unlike Brazil, was lower level of transparency and publicly available (raw) data provided by the judiciaries themselves about the functioning of justice or ongoing judicial projects respectively. Although some member states slowly begin to provide more and more information on judicial related websites, the judicial systems, to a certain extent, still tend to be kind of closed environments guided by the principle of official secrecy.

Concerning digitalisation, the survey in the EU-member states disclosed that all the member states having participated, take advantage of digital tools in their justice systems. It was more to find out which tools are supported, by which authorities and to which extent. The experiences and talks during the missions helped to obtain a more solid image of the situation in practice.

Having a look at the proceedings, it became clear that the (full) implementation of digital tools in civil matters is slightly higher than in criminal proceedings, while it is quite well-balanced between the instances. These numbers are confirmed by the exchange during the missions, disclosing the need of catching up, in particular, in criminal matters, where paper-based proceedings are still quite predominant.

However, Brazil, based on years of technological implementation, recently put in place a strong effort to fully transform its judicial system, which is reflected by the implementation of innumerate legal actions and digital projects. Some of the projects, like 100 % Digital Justice

and the Virtual Desk, can definitely serve as best practices for the EU member states' judicial systems improving access to justice irrespective from a crisis-related approach. Meaning that digital tools are not only regarded as a workaround but more of an autonomous solution.



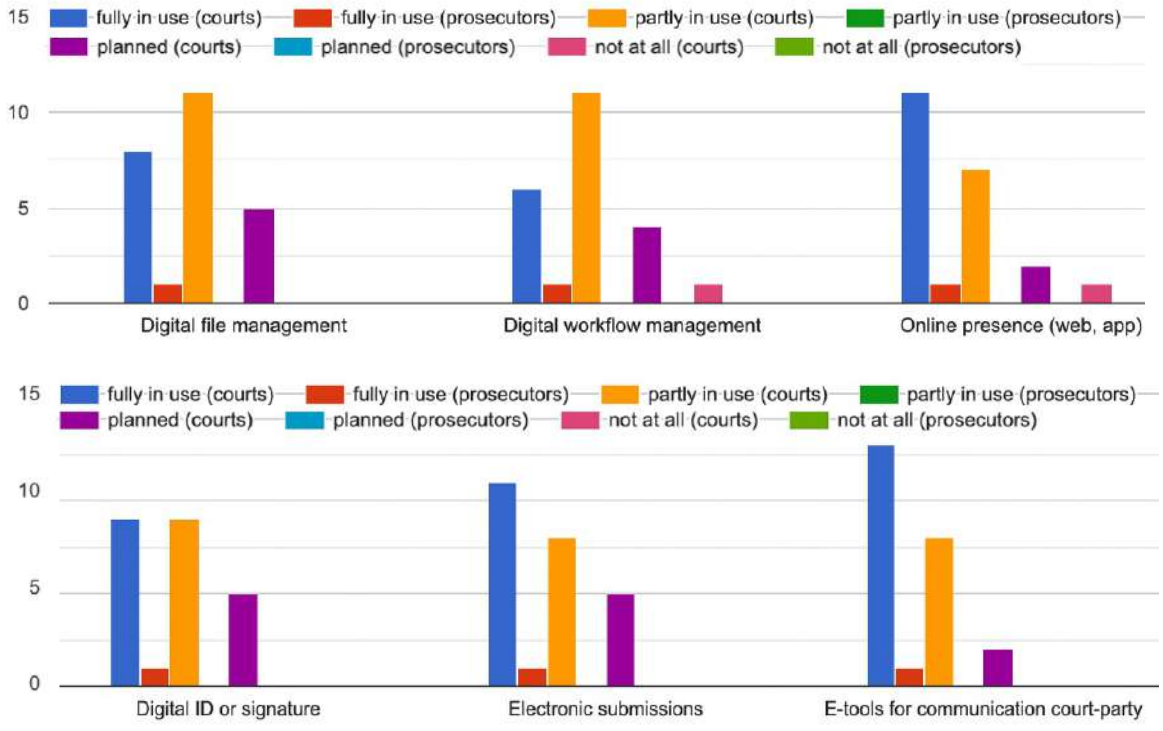
All three EU target countries (Austria, Estonia and Germany) do have plans to completely digitise their judicial systems in the next three to five years, but despite of full commitment of the persons responsible it seems to require quite a lot of effort to reach these objectives. Federations with strong federal states and, subsequently, judicial structures, like Germany, tend to struggle with a lot of cooperation work to agree on joint proceedings or electronic tools respectively. Redundant software developments and maintenance as well as the need of interoperability (interfaces) stress state budgets. This does not apply to Austria to this extent, since it is the federation, in fact the Federal Ministry of Justice, which is exclusively competent for the development and implementation of digital tools of the (ordinary) judiciary. However, the separation of ordinary and administrative judiciary, and the unique position of the high courts, result in the development and usage of different electronic systems, and multiple costs. Estonia, apparently, pursues a holistic approach of digitalisation, meaning that the judiciary

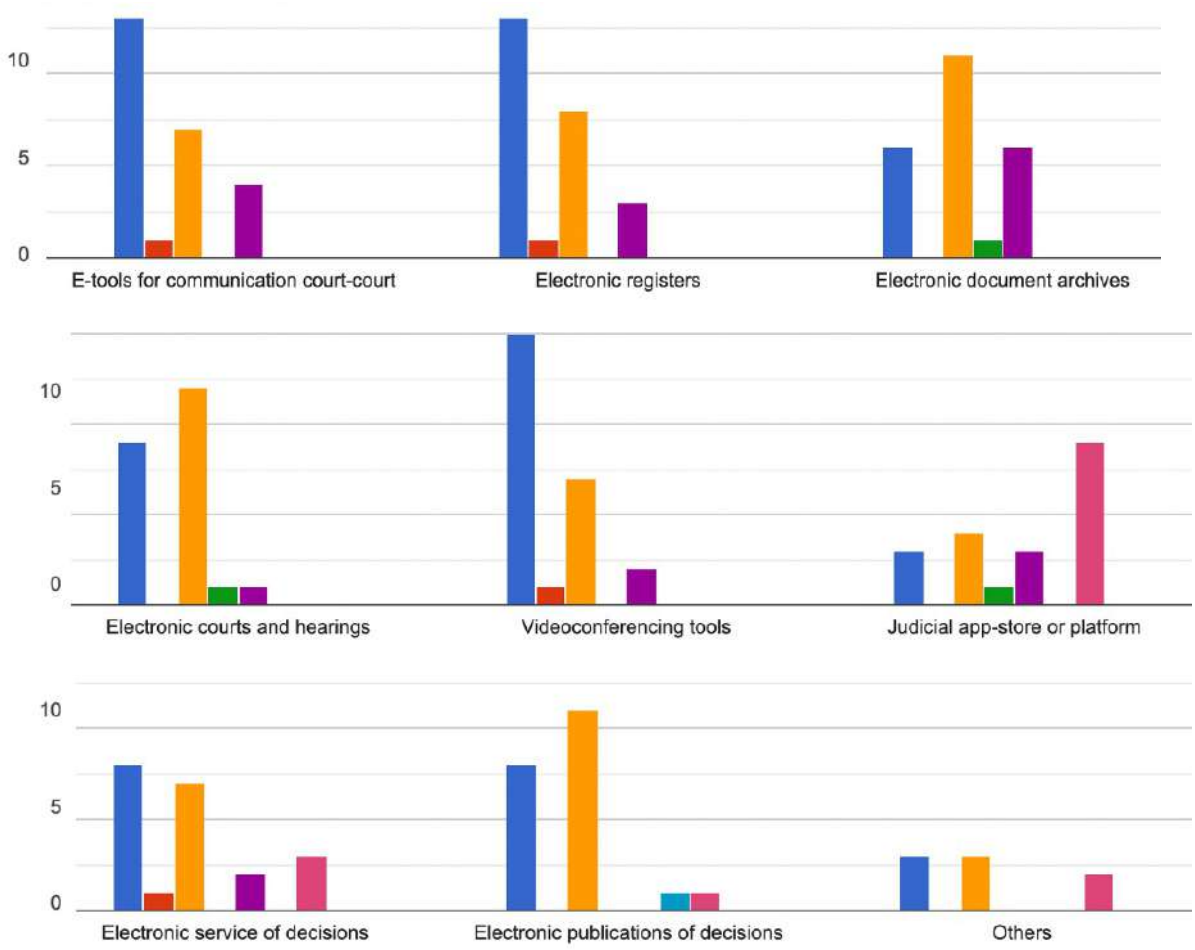
broadly takes advantage of the governmental IT infrastructure. While the governmental branch seems to fully rely on digital systems, also regarding the inclusion of citizens, the mission to Estonia disclosed that the judiciary, in practice, lags a little behind, be it, like in many judicial systems, due to the reluctance of (some) judges, be it because of the manageable size of cases (in small countries). The electronic communication and the cooperation between the different authorities also appeared to be improvable.

In general, in all three states, different competencies and the lack of (political) cooperation and commitment, also in terms of budget and staffing, seem hindering (faster) technological progress and synergies, though the different stakeholders in the judiciary are all willing to constantly improve their systems.

The question in the survey of the digital tools in use produced different results. It disclosed that electronic tools for communication are widespread, which might be the result of reduced traditional means of communication during the pandemic. Digital file and workflow management tools as well as e-courts seem to be quite common in most of the participating countries, at least, partly, or additionally to traditional proceedings. At this stage, 100% digital proceedings, like in Brazil, have not been realised, which may be explained by the need to ensure jurisdiction during the Covid-19 pandemic in areas that are infrastructurally difficult to reach, which is likely to have accelerated digital progress in Brazil.

Which digital tools? (Please scroll to the right if you do not see all answer options) Copy





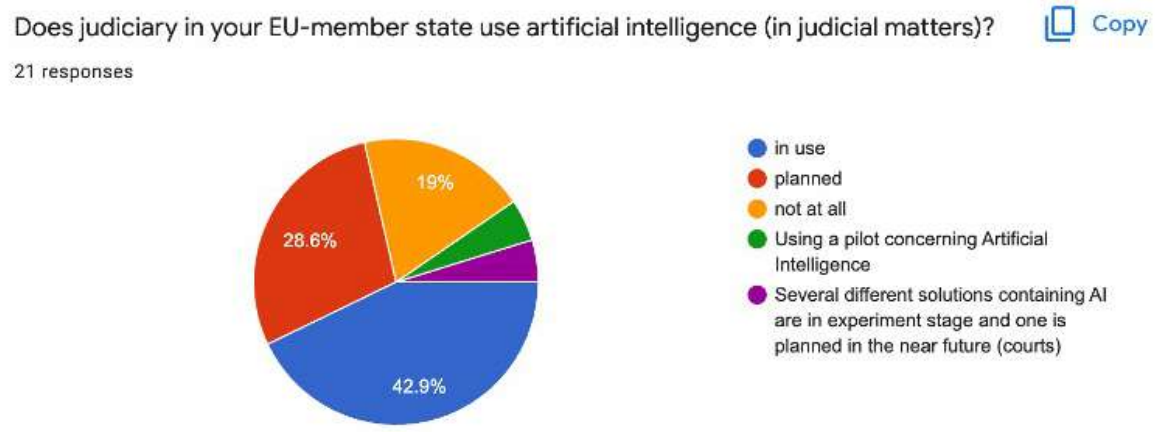
Artificial Intelligence

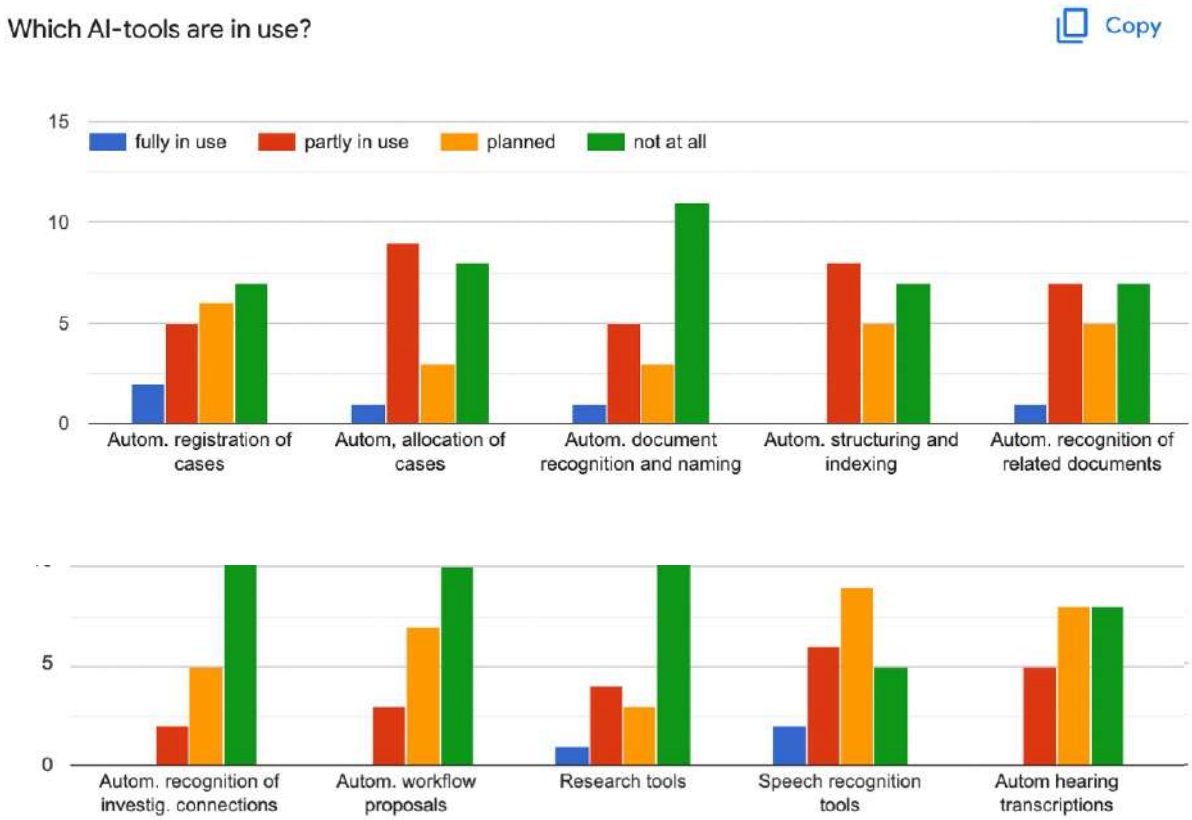
Since its consequences are considered as critical, one of the most discussed issues is the usage of Artificial Intelligence-based tools in justice. The missions to the EU member states showed that it is kind of a hot potato to touch and the persons responsible were kind of cautious to speak freely about the (future) application of that kind of tools, at least when it comes to the matter of autonomous decision-making, also discussed as robot-judge.[4] The reasons may lie in exaggerated press articles and discussions on AI and therefore creating mistrust and fear that this could, at some point, lead to the replacement of human judges.[5] Despite these circumstances, quite surprisingly, there are a few EU countries apparently planning to or already taking advantage of AI, also as to decision-making, at least partly (Italy, Estonia, Lithuania, Poland, Slovenia). In which proceedings and to which extent, will require further research. The responses of the EU member states and also the talks during the missions gave rise to the conclusion that the majority uses AI based instruments only for supportive judicial and

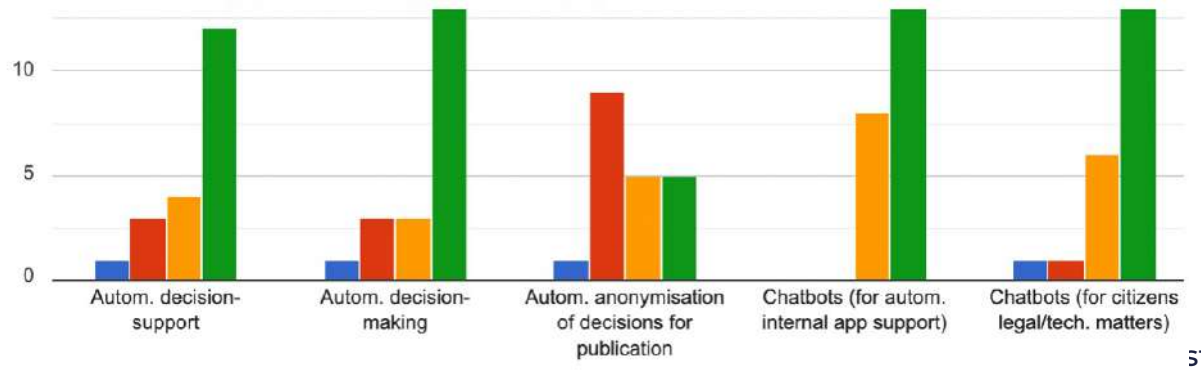
4 *Estonian Ministry of Justice*, https://www.just.ee/en/news/estonia-does-not-develop-ai-judge [01/08/2022].

5 *Wired*, https://www.wired.com/story/can-ai-be-fair-judge-court-estonia-thinks-so/;

administrative tasks as well as for structuring and classification of data. While in Germany it was more the public prosecution to rely on Artificial Intelligence (*inter alia*, for the efficient fight against child pornography), Austria, for example, has successfully developed an AI-based automated tool for the anonymisation and publication of court decisions. Estonia's judiciary has an automated transcription tool in place, but rarely used in practice, due to live recording and tagging accepted by the Supreme Court as sufficient documentation of trials.



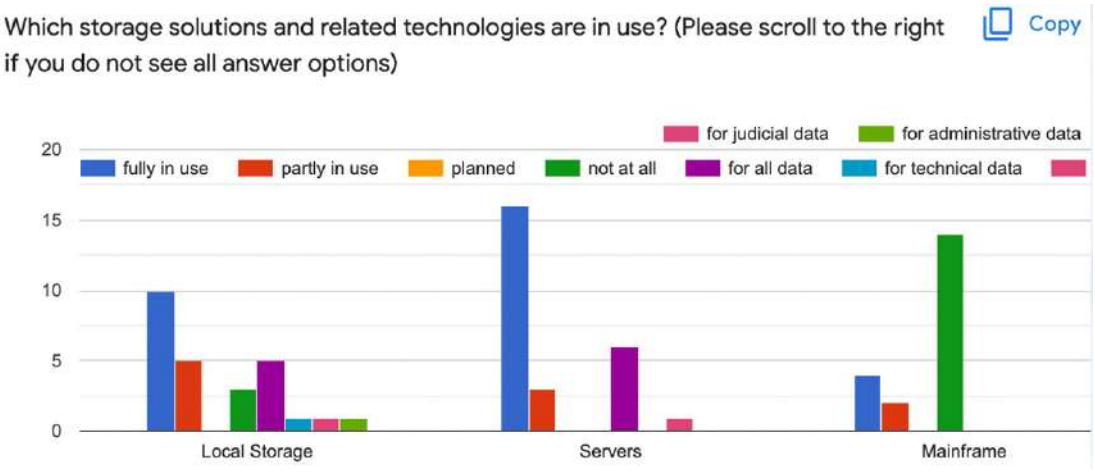




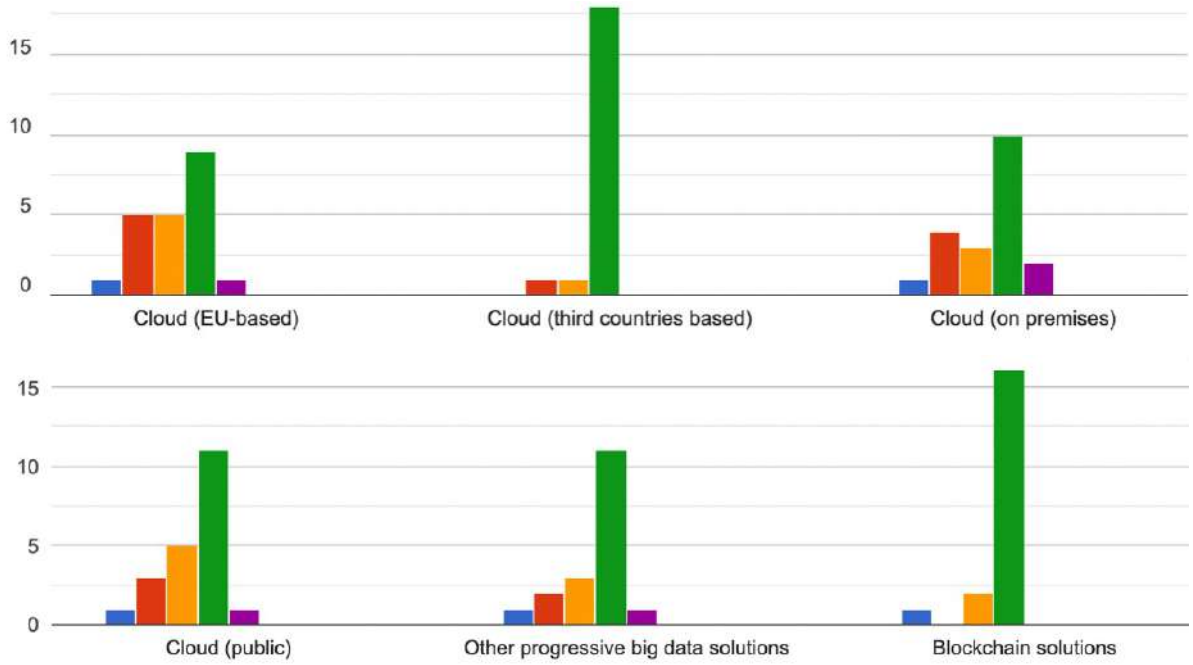
st three functions: i) for classification of judicial demands; ii) for supporting the work flows, particularly in terms of operational and administrative demands; and iii) for suggesting courses of action and decisions. Official numbers, as of May 2022, state that there were forty-one projects AI projects being tested, developed, or implemented in thirty-two courts and tribunals.[6] The developments appear to be consistent with the overall digitalisation push taking place in the country.

Storage solutions and statistics

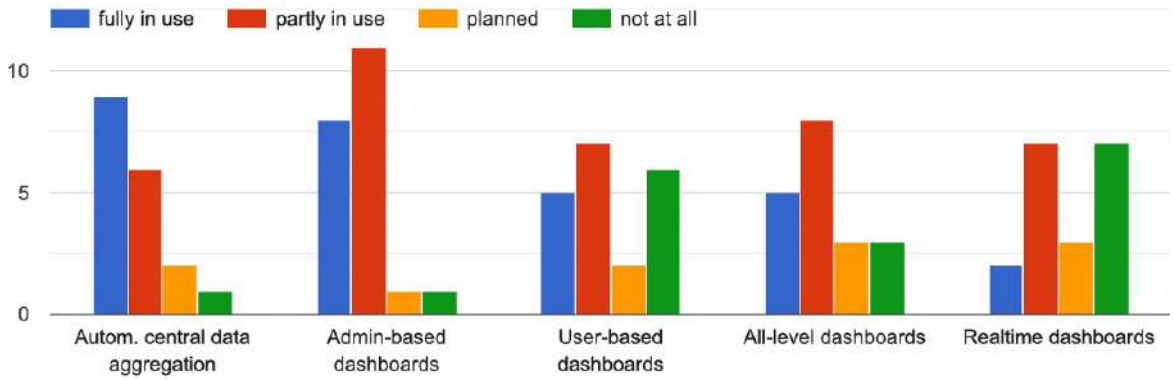
The research in terms of storage solutions revealed the broad reliance on local- and server-based solutions while the transition to cloud-based models, against the background of scalability and cost-effectiveness, are widely considered as inevitable. In Brazil and the EU member states, certain considerations still hinder the use, they are particularly acute in terms of cyber security, data protection and possible lock-in. However, European countries, unlike Brazil, which relies to a certain extent on private clouds, be it due to the legal framework, be it for reasons of data security, use or plan to support only EU-based and public cloud systems. The implementation of blockchain technology, which, in particular, Estonia promoted in its fight against severe cyberattacks, is on the agenda only in Italy and Latvia.



6 These numbers may go up including, particularly, tools on testing stage reaching 111 tools in 53 courts and tribunals. See for instance: https://brasil.un.org/pt-br/188306-pesquisa-identifica-111-projetos-de-inteligencia-artificial-no-judiciario.



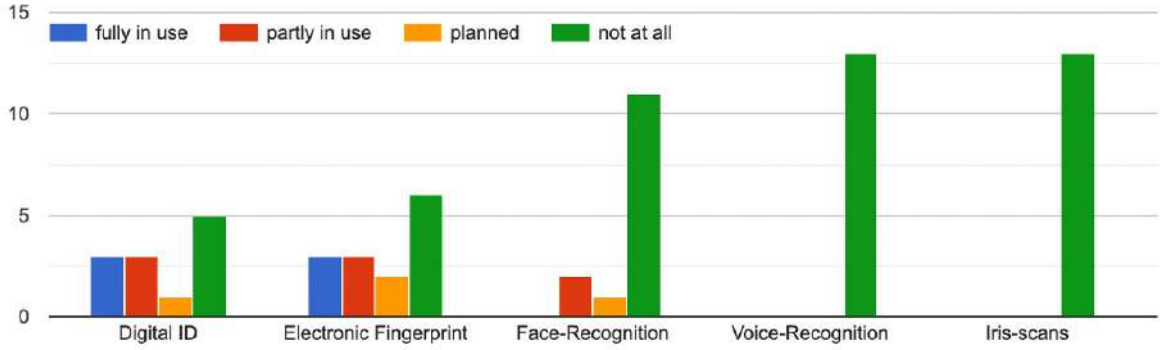
Dashboards are a great instrument to measure different indicators related to judicial processes as well as workflows, and to make visible values like case numbers, the length of proceedings or the workload of the judicial staff. The judiciary has recognised their importance for identifying weak points and deficiencies as well as to obtain data for objective policy and decision-making. While several EU states resort to admin-based and judicial user-based dashboards, the Brazilian dashboard DataJud is an open access tool allowing everybody to obtain live data of the judiciary.

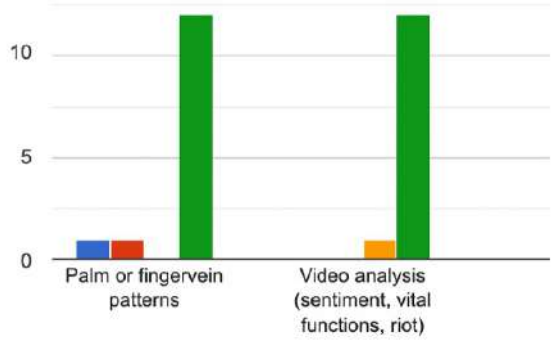


Biometrics

Another aspect of the study, although not the major one, was the use of biometrics, especially in criminal matters and the penitentiary system. Digital ID and security systems based on fingerprint scanners are already in use, more advanced systems, additionally based on Artificial Intelligence are planned in some research or pilot projects. For example, in Austria, there is a research project named KIIS which evaluates the implementation of more advanced AI based tools, including wearables or sensor-based surveillance (also using facial recognition) for violence-prevention. At least in one prison in Austria, furloughs are administered by means of palm vein-scans. Germany, in fact North Rhine-Westphalia, did a pilot on suicide-control tools based on AI in the penitentiary system. Unlike human administered surveillance, AI-based systems are praised to be less intense because of their event-related reaction or intervention.

In Brazil, the use of biometrics in the penitentiary system, apart from identification, is more the exception than the rule. Against the background of overcrowded prisons, increasing the conditions of detention by means of biometrics could be a possible way. For example, the research project of the Austrian penitentiary system based on biometrics and AI, could be a possible avenue for further exchange.

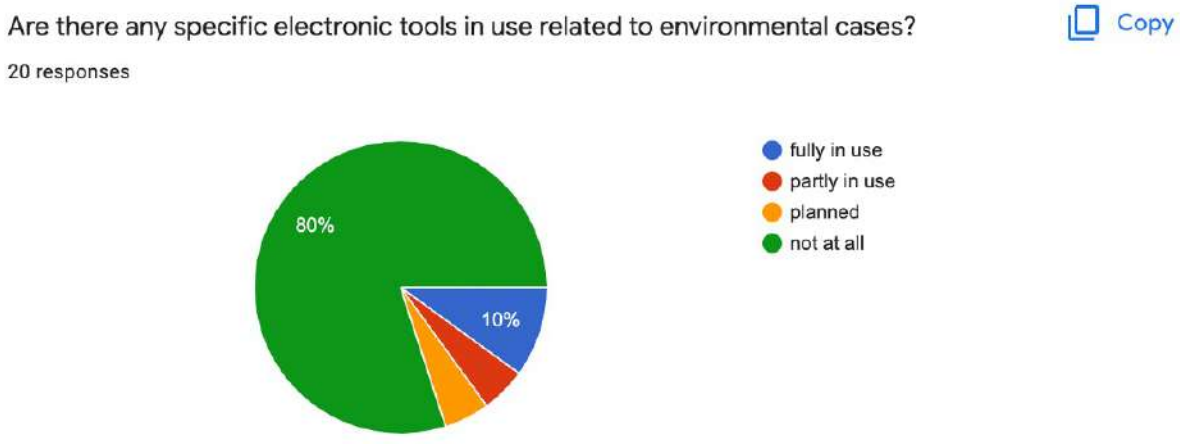




Environmental matters

Notwithstanding that the importance of environmental protection has been recognised in recent years, there still seems to be room for improvement in the development and implementation of specifically judiciary-related digital tools.

The replies from most of the EU countries indicated hardly any environmental-related judicial tools in place. Only in Sweden, there seems to exist a digital geographic information system with maps and different layers of information implemented in the digital case management system. Other positive replies turned out not specifically environmental-related or will require more extensive research.



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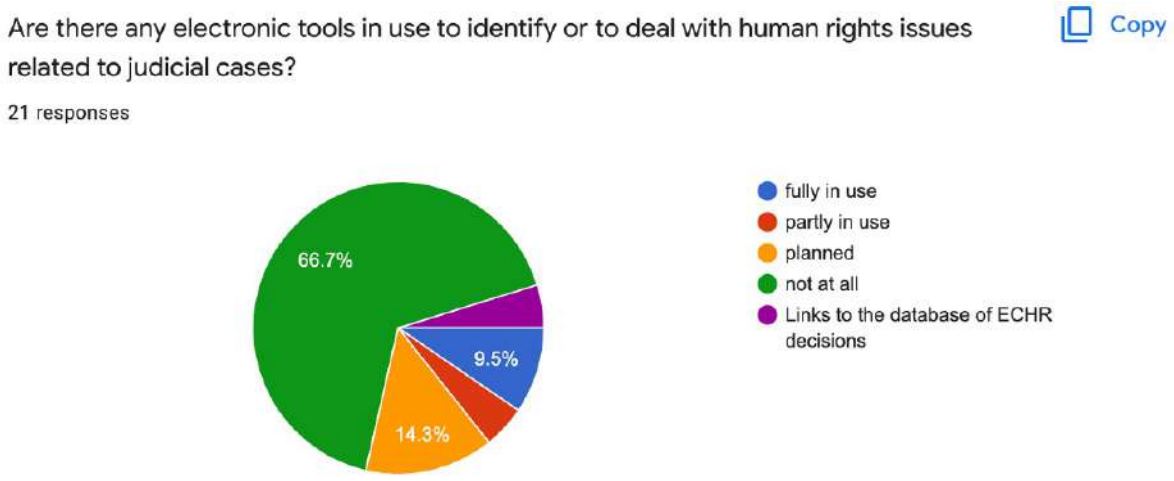
environmental violations, particularly deforestation. It is an important mechanism for evidence-based environmental policymaking.

Human rights matters

Also, in terms of human rights matters, the level of specific electronic tools proved to be relatively low. While some of the EU member states replied to the question in the affirmative, on request, only Estonia and Slovenia confirmed having an electronic tool which creates links to the HUDOC database or (partly) translates or summarises decisions of the European Court of Human Rights.[7] Brazil, on the other hand, concentrates on the provision of several human rights-related tools for citizens while digital applications for judges seem to be rare.



A human rights issues were not prioritised on the digital agenda of the (ordinary) judiciary. Although there are some initiatives of different stakeholders (European Union Agency for Fundamental Rights, Council of Europe, private), the judiciary itself would be well advised to raise awareness in this area and to think about including specifically human rights-related tools or functionalities in their systems to reach this goal.

In Brazil there is an additional emphasis on providing tools specifically designed for the protection of groups in terms of race, gender, sexual orientation, children. Hence, there are mechanisms developed to resolve specific issues concerning such groups. Examples can be found in chatbots aiming to facilitating access to information in situations of domestic violence. They serve to speed up delivery of services protecting human rights.

7 *Estonian State Gazette* (original title: "Riigi Teataja"); https://www.riigiteataja.ee/kohtuteave/eik_liigitus.html?tegevus=&jaotus=EIK.EIK2&avatudJaotused=&suletudJaotused=&jaotusedVaikimisiAvatud= [01/08/2022].

II. INTRODUCTION

The digital transformation process of numerous governance and citizenship aspects has been growing in many spheres, including the judiciary, in the European Union and its member states as well as in Brazil. This trend has gained further dynamics since the beginning of the Covid-19 pandemic, leading to a greater use of digital tools by society and by public authorities, thus responding to emerging challenges and improving access to justice and the efficiency of justice systems.

Although significant work has already been done, there are actions yet to be performed, specifically regarding international cooperation in order to fully exploit the benefits of digital technologies in judicial proceedings.

Digitalisation of public and restricted access databases can certainly contribute to greater transparency, making access to justice facilities easier although at the same time it increases cybersecurity risks. In such regard, the use of Artificial Intelligence (AI) combined with ethics, transparency and governance principles are a key priority tackled by the EU as stated in the European Commission proposal for a Regulation of the European Parliament and of the Council laying down harmonised rules on Artificial Intelligence (Artificial Intelligence Act)[8] or the Council of Europe CEPEJ European Ethical Charter on the use of Artificial Intelligence in judicial systems.[9] In Brazil, those issues are addressed by Resolution 332 issued in 2020 by CNJ,[10] covering aspects that affect administrative, financial and management efficiency, including transparency, thus affecting positively human rights protection. It is important to note that the Brazilian resolution contains quite the same principles as the above-mentioned European legislative acts.

In line with this trend and mutual priorities, the current action aims to foster the exchange of best practices and approximate the respective activities in the field of e-Justice, starting from a global approach on the theme of digitalisation of justice systems, Artificial Intelligence, and innovative technologies, also addressing concrete initiatives and fields of application.

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8 Regulation of the European Parliament and of the Council laying down harmonised rules on Artificial Intelligence (Artificial Intelligence Act) and amending certain union legislative acts; COM(2021) 206 final; https://eur-lex.europa.eu/resource.html?uri=cellar:e0649735-a372-11eb-9585-01aa75ed71a1.0001.02/DOC_1&format=PDF [01/08/2022].

9 *Council of Europe*, CEPEJ European Ethical Charter on the use of Artificial Intelligence in judicial systems; https://www.coe.int/en/web/cepej/cepej-european-ethical-charter-on-the-use-of-artificial-intelligence-ai-in-judicial-systems-and-their-environment

10 CNJ; https://atos.cnj.jus.br/atos/detalhar/3429 [01/08/2022].

The EU is committed to improving access to justice across the continent through the development of a European Electronic Justice programme. The European Council has adopted a strategy and an action plan in this direction, the "e-Justice" programme covering the 2019-2023 period, through which access to justice is simplified and improved while cross-border legal procedures are digitised.[11]

During the 2019-2023 period, the European e-Justice programme focuses on three main objectives:

- Improve access to information around justice.
- Continue to digitalise judicial and extrajudicial processes to offer easier and faster access to the courts.
- Ensure implementation and technical management of national e-Justice systems to facilitate interconnection and interoperability between member states' systems.

In such a framework, a set of measures has been foreseen to enhance the efficiency and effectiveness of judicial cooperation, including across borders.[12]

A recent study supported by the European Commission highlighted novelties regarding cross border digital criminal justice,[13] indicating new management systems based on IT platforms and innovative cooperation and communications tools, to be adopted by Eurojust.[14] Another relevant study has focused on the use of innovative technologies in the justice field,[15] based on the use of AI and innovative technologies in accessing justice, covering both the EU as well as its member states.

This action, which focuses on the exchange of good practices with selected EU member states, has taken into account the degree of maturity of e-Justice in place, also considering its application in specific fields within environmental and human rights policies, and prioritised outreach to selected countries.

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11 European e-Justice Portal, https://e-justice.europa.eu/home.do?action=home&plang=en [01/08/2022].

12 *European Commission*, E-Justice Scoreboard, https://ec.europa.eu/info/policies/justice-and-fundamental-rights/upholding-rule-law/eu-justice-scoreboard_en [01/08/2022].

13 Publications Office of the European Union,https://op.europa.eu/en/publication-detail/-/publication/e38795b5-f633-11ea-991b-01aa75ed71a1/language-en [01/08/2022].

14 European Union Agency for Criminal Justice Cooperation, https://www.eurojust.europa.eu [01/08/2022].

15 European Commission, https://ec.europa.eu/info/policies/justice-and-fundamental-rights/digitalisation-justice/relevant-studies_en [01/08/2022].

In Brazil, the e-Justice approach is targeted to optimising governance, transparency, and the efficiency of the judiciary, with an effective approximation to citizens, major protection of human rights and a reduction of expenses.

In this context, the judiciary is focusing, amongst many other digital and technological projects and programmes, on the Justice 4.0 initiative, aiming to promote innovation and the effectiveness of justice. The objective is to speed up the judiciary allowing technological innovations to enter the scene, for a deep transformation of jurisdictional provisions. Thus, following the mainstream Industry 4.0 pathways,[16] the intent is to prioritise digitisation of processes, the use of videoconferencing, the adoption of mobility resources, the interoperability of systems and databases, the use of cloud computing, business intelligence, machine learning, and Artificial Intelligence. The use of these disruptive technologies drives new forms of justice functioning more in line with the demands for efficiency, speed, equal access, and treatment.

Access to digital justice is one of the core priorities for the mandate of Minister Luiz Fux, in his Presidency of the Brazilian Supreme Court – STF and CNJ, for the biennium 2020-2022. This is especially relevant when related to other key priorities which are the protection of human rights, criminal justice and the environment, all part of the streamlined projects designed at the beginning of his mandate under the "Five Axes of Justice" (Cinco Eixos da Justiça).[17]

The actions and projects included in the Justice 4.0 programme that seek to promote access to justice are the following: implementation of 100% Digital Judgement; a Digital Platform of the Brazilian Judiciary (PDPJ), with the possibility of expanding the degree of automation of the electronic judicial process by using Artificial Intelligence; assistance to the Courts in their processes, databases and activities; implementation of an automated way of transforming decisions and requests by using AI models; development of a research tool and asset recovery system in case of corruption and white-collar crimes; and development of a new National Seized Property System - SNBA, which allows not only the registration of assets but also their management and destination by the judiciary.

With the "100% Digital Judgement", all procedural acts can be performed by electronic and remote means, including hearings and sessions that will take place only by videoconference and remote attendance during forensic business hours by any means of communication as telephone, e-mail, videoconference, applications, or others defined by each court.

16 *Gubán/Miklós/György Kovács*, "INDUSTRY 4.0 CONCEPTION." Acta Technica Corviniensis-Bulletin of Engineering 10.1 (2017), "The growing market globalisation, increasing global competition, and more complex products results in application of new technologies, methods and business processes. Fast changing market environments and fluctuating customer demands require efficient operation of logistical processes. In this study the logistical tendencies and challenges are introduced with reasons and driving forces. [This is] The essence of Industry 4.0 conception".

17 *CNJ*, 5 Eixos da Justiça (2020); https://www.cnj.jus.br/wp-content/uploads/2020/09/5-Eixos-da-Justiça-Ministro-Luiz-Fux-22.09.2020.pdf [01/08/2022].

The Digital Platform of the Brazilian Judiciary is a way to integrate all the electronic process systems currently running in each of the 90 courts of Brazil to a common convergence standard, involving ways to develop, maintain and create user-centred experiences in the interface of these systems. It defines common concepts of optimisation and standardisation of workflows, promoting the use of open-source technologies.

Justice 4.0 is being implemented by the CNJ in regional courts around the country and counts also with the support of the United Nations Development Programme (UNDP), in the general objective of developing strategies, studies, methodologies and actions focused on promoting innovation and digital transformation to expand access to justice.

The digitalisation of justice is also particularly relevant, in its application to concrete spheres, which are also part of the mainstream projects of the judiciary, implementing digital justice and innovation approaches in the fields of protection of human rights and the environment.

In such spheres, innovative technologies are applied to increase the protection of the judiciary, as minority, children, the elderly, and gender, so as the promotion of protection of the Brazilian environment, thus becoming an instrument which serves the constitutional mandate of the judiciary.

Other applications of e-Justice initiatives are implemented under the policies and programmes developed within the scope of the Department of Monitoring and Inspection of the Prison System and the System for the Execution of Socio-Educational Measures.

An example of an innovative and technological programme developed by the National Council of Justice, which implements e-Justice practices, is SireneJud, a framework containing an interactive panel and database with inter-institutional data on environment. Using free and open-source software, it consists of a Geographic Information System (GIS) built with an innovative methodology which was created responding to needs of the Judiciary. These achievements have also been possible thanks to the findings of an Action implemented with the Delegation of the European Union to Brazil, whose final report was issued in December 2020.[18]

Within the "Doing Justice" Programme, implemented by the CNJ in partnership with UNDP and the Ministry of Justice and Public Security (MJPS), innovative approaches and solutions are being adopted, such as the Electronic United Enforcement System (SEEU): a public digital

18 *CNJ/EU*, Justice and socio-environmental protection in the Brazilian Amazon (2020) https://www.cnj.jus.br/wp-content/uploads/2020/11/JUSTICE-AND-SOCIO-ENVIRONMENTAL-PROTECTION-IN-THE-BRASILIAN-AMAZONIA_V-6_2020-12-16.pdf [01/08/2021].

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system focused on monitoring the progress of criminal decisions, controlling the benefits and progressions of the penal regime, positively impacting on the penitentiary system management. This system helps Brazilian courts to better comply with the principle of protecting the rights of prisoners and promoting an efficient justice system, also improving the protection of vulnerable groups, thanks to the disaggregated data which the system produces. The use of digital tools to support fair law enforcement reducing delays has been an important asset for human rights protection, so as for efficiency and management of the justice system. Within this programme, numerous lines of actions are based on the use of innovative technologies, resulting in major means for protecting human rights, in different spheres.

These are examples of initiatives implemented by the Brazilian judiciary for promoting modernisation and innovation measures, ensuring its constitutional role to protect and support a sustainable environment for future generations. The innovation takes place through the incorporation of cutting-edge tools and techniques that can be improved with this international dialogue with European institutions.

III. SUBJECT OF THE STUDY AND METHODOLOGY

A. SUBJECT OF THE STUDY

The needs of economy, efficiency and sustainability are global, and the judiciary in different countries of the world tend to be hard pressed to be up to the task and manage a workflow that tends to be both demanding and complex. Solutions that involve digitising certain or all aspects of the processes and procedures of the judicial systems are present in virtually every nation, it is not different for members of the European Union and for Brazil.

This study will focus particularly on electronic Justice, or e-Justice, understood as chiefly the digitisation of documents, digitalisation of judicial and extrajudicial proceedings, and facilitating access to information in the field of justice, implementation of management systems to facilitate harmonisation, uniformisation and interoperation of electronic systems. E-Justice means both a better workflow for the judiciary and an easier and more efficient access to justice for citizens and the institutions that support the judicial systems such as prosecution services, public defenders, and attorneys.

B. OBJECTIVES OF THE STUDY

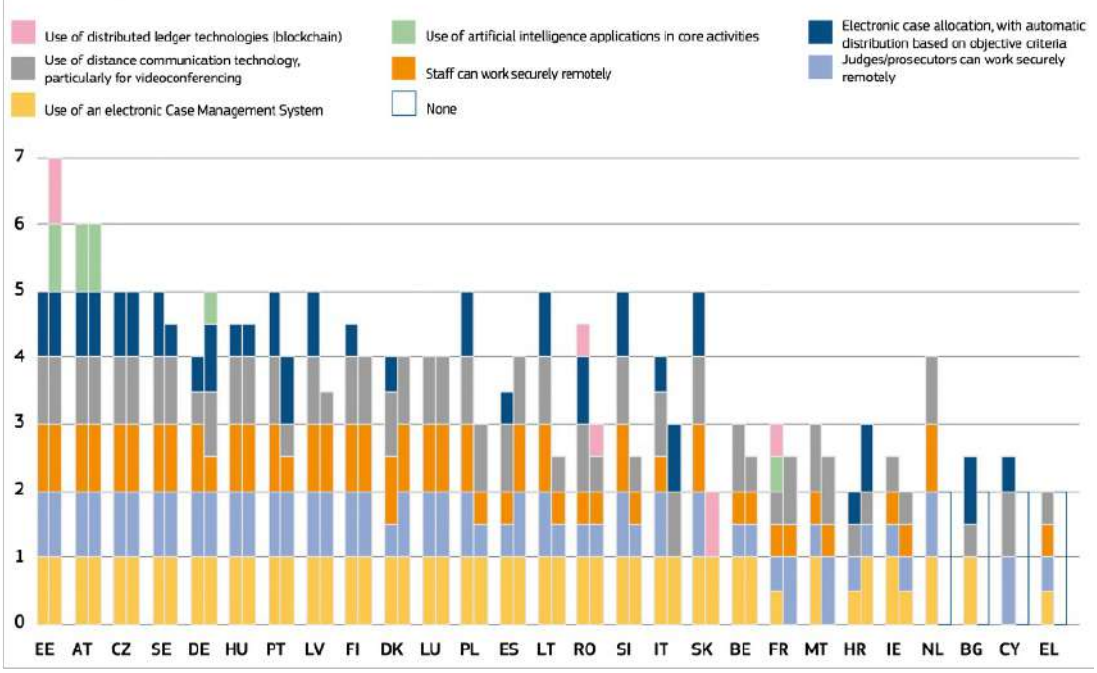
The overall objective of the EU-Brazil exchange is to improve access to justice. This guiding principle, which is not only reflected by the political agendas of the European Union and Brazil, but also by international as well as national fundamental rights catalogues, may serve as a strong argument for the advancing digitalisation of judicial systems, in particular, in the post-

pandemic era. All efforts made before having increased exponentially, since the restrictions of public life by means of confinements in the past two years have shown the importance of the functioning of public administration and justice in times of crises. This exceptional situation must not cover other areas of concern when it comes to efficiency of justice. Nearly every judicial system struggles with more or less huge backlogs, the lack of financial and personnel resources and the related delays in judicial proceedings. This is not only a problem of compliance with the rule of law and other legal requirements, like fair trial guarantees, but also a matter of credibility and trust in political leadership as well as of confidence in the judiciary. Apart from this problem-related approach, one might not miss the big opportunities affiliated with the digitalisation of judicial proceedings or workflows, and the related improvement of efficacy as well as of quality of justice. The potential not only to regain the trust of citizens but also to foster the level of satisfaction of judges and judicial staff, which deal with an unscalable workload, speaks for itself.

This study has the objective of bringing together e-Justice initiatives of the EU – and selected member states (Austria, Estonia, and Germany) – and Brazil to showcase best practices and highlight lessons learned in order to improve human rights and environmental protection. The three countries were chosen by the assigned EU expert based on the different sources, in particular, the EU Justice Scoreboard 2021 of the European Commission,[19] which indicated a mixture of a high level of modern technologies in their judicial systems.

Figure 41 Use of digital technology by courts and prosecution services (*)

For each Member State, the two columns represent the use of digital technology in the following authorities (from left to right):
1. courts
2. prosecution service



19 *European Commission*, EU Justice Scoreboard 2021, https://ec.europa.eu/info/sites/default/files/eu_justice_scoreboard_2021.pdf [01/08/2021].

Another aspect for the choice was their suitability for a comparative analysis with Brazil, especially in terms of the size of the country and the special need for coordination (Germany), similar technologies in use (the Estonian X-road and the Brazilian Plataforma Digital do Poder Judiciário) and high level of digitalisation (Estonia) or several AI based solutions and a broad experience in the e-justice field, also in the European context (Austria).

All stakeholders can learn from each other, and a systematic comparison serves this purpose. The study shall increase knowledge on the current use of Artificial Intelligence (AI) and technology tools in line with e-Justice principles and interoperability approaches in both Brazilian and European Union contexts. Additionally, to improve judiciary practice, possible normative acts shall be suggested.

C. METHODOLOGY

From a methodological point of view, the present report is mainly based on a comparative approach. Therefore, the legal frameworks, the technical solutions and best practices of the EU and its member states as well as of Brazil have been analysed and contrasted by both the EU and the Brazilian expert. Since not all member states of the EU member states have at their disposal digital solutions in all fields concerned, the study, therefore, highlights the solutions of the greatest interest without claiming to be exhaustive.

To make both legal spheres, which enframe the environment of digital progress, comparable, the experts found it necessary to emanate from the description of the constitutional determinants, and therefore drew upon the methodology of legal doctrine.[20] This allows the reader to deeply understand the background which the laws concerning digital solutions are embedded in and the challenges within these systems which the legislators and judicial authorities have to face. It also applies to the second layer of legal acts, which factually determine the conditions for digitalisation of justice and the implementation of the tools.

The description of the legal framework is considered to be substantial to assess the target-orientation of legal measures and to identify the winning formula for digital strategies. This legal-sociological approach shall facilitate figuring out the strengths and weaknesses of both systems and shall maximise the optimum output in terms of further promotion and successful implementation of digital tools. Against this background, the starting point of the present study was the search for the most advanced digital solutions in different branches of the judiciary and to clearly highlight best practices without neglecting initial difficulties or failure. This approach may help all stakeholders to improve their strategies and to take shortcuts on the path to full digitalisation.

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20 For structural reasons and easier understanding also the founding treaties and other sources of primary law are indicated as constitution or constitutional law.

Additionally, the present research entailed a mission of Brazilian experts, namely five members of CNJ with participation of the assigned EU-expert to three EU member states (Austria, Estonia, and Germany) to facilitate a real peer-to-peer exchange. This allowed not only the transfer of first-hand knowledge but also a direct view on the situation *in situ* beyond representative purposes. Therefore, this part of the project relied on empirical collection of qualitative data from a selected peer group.

Moreover – to give a broader picture in the still heterogenous situation in the EU member states and to be able to make more general statements about the state of digitalisation in Europe –, the authors created a custom-tailored survey on digitalisation and the use of Artificial Intelligence. Selected stakeholders (Ministries of Justice, Supreme Courts, Courts administrations, scientific experts) in all EU member states were asked for participation. Hence, the report is supplied with up-to-date and first-hand information directly from the EU member states. Since the bigger part of the EU member states took part and replied, the results can be considered representative to a certain extent.

The dialogue of the EU and the Brazilian expert with practitioners from both legal hemispheres allowed a deeper insight into the daily business' challenges of judges and other legal professionals and facilitated strong feedback on the first results of digitalisation of justice and on further legal and technical adaptations which will be required. Thus, the study also relies on legal-sociological methodology and may also contribute to a more results-orientated legislation based on the inclusion of the experiences of judicial decision-makers.

IV. DIAGNOSTICS

The social and technological transformations of the last three decades have had an impact not only in society but also in how the judicial system provides its services both internally – for its own work and externally – in connection with other public and private institutions and towards citizens, end users. Two interconnected dynamics – the digitisation of documents and the digitalisation of processes - have combined to form what conventionally has been called electronic justice or e-Justice.

This development appears to be a response to three particular challenges: (a) the volume in terms of workload; (b) the speed in terms of the average time necessary for a case to be adjudicated; and (c) the efficiency of policy making in terms of evidence-based decision making. One additional challenge should be noted: the coordination of efforts and governance of data and systems. This last challenge seems to be particularly more acute as the judicial structures become more widely spread and complex as is the case in the EU and Brazil.

In terms of **volume and workload** the challenge in Brazil is significant as the data shows that each year on average more than 25 million new lawsuits are filed on top of around 75 million cases still pending. In relative terms this means around 12.000 new cases per 100.000

inhabitants, which leads to more than 6000 cases per judge a year. The scenario is one that leads to an opportunity as digitalisation of procedures can simplify processes and automation may diminish repetition, in other words effective and efficient service.[21]

In the European Union and its member countries, despite the differences between the different states, there are also challenges in terms of high volumes of cases and a significant workload per judge.[22] Not all countries face a backlog of cases, nor high volumes of cases per judge a year, yet there seems to be an important trend towards seeking an effective and efficient service.

As for **speed and length of time** necessary for a pending case to be resolved, again the numbers vary country by country. Yet there seems to be a clear indicator that as the demand for judicial services rises, there is a need to develop innovative strategies in order to achieve a reasonable length of time in order to resolve them. This means being able to deal with the inflow of new cases (and whenever present, also the pending cases as well) within a reasonable period of time.

In terms of Europe, recent studies show that the average country is able to maintain a situation that is within what is considered standard around 300 to 500 days.[23] In Brazil, the numbers show a growing capacity to deal with the inflow of cases as the ones pending are steadily diminishing so as the average time, currently more than 4 years and a half.[24]

There is one extra element that needs to be considered, which is the expectations of the end users, citizens, from the judicial services. As the speed of society increases, so do the expectations that lawsuits will find an end. The deployment of information and communication technologies and particularly novel techniques and systems such as Artificial Intelligence become a virtual necessity in order not to frustrate the demands of society and maintain a level of legitimacy in the service.

Additionally, as data becomes central for developing public policy, the judiciary is called to play a role not only in providing data – as much of the complex controversies ended up in the judicial system – but as well that its own **policies are evidence-based**.

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21 *CNJ*, Inteligência artificial e aplicabilidade practica no direito, https://www.cnj.jus.br/wp-content/uploads/2022/04/inteligencia-artificial-e-a-aplicabilidade-pratica-web-2022-03-11.pdf [01/08/2022].

22 *European Commission*, EU Justice Scoreboard, https://ec.europa.eu/info/policies/justice-and-fundamental-rights/upholding-rule-law/eu-justice-scoreboard_en#factsheets; *Council of Europe*, Dynamic database of European judicial systems; https://www.coe.int/en/web/cepej/cepej-stat [01/08/2022].

23 *Council of Europe*, European judicial systems CEPEJ Evaluation Report 2020; https://rm.coe.int/evaluation-report-part-1-english/16809fc058 [01/08/2022].

24 *CNJ*, Inteligência artificial e aplicabilidade practica no direito, https://www.cnj.jus.br/wp-content/uploads/2022/04/inteligencia-artificial-e-a-aplicabilidade-pratica-web-2022-03-11.pdf [01/08/2022].

This is particularly acute in the areas that this study focuses: the environment, criminal and penal matters, and human rights. The social and collective (homogenous or otherwise) dimension of these areas creates an opportunity for using big data, jurimetrics, and statistical analysis in order to provide significant diagnostics of issues and even indications of potential avenues of solutions.

The possibilities are endless for cross-referencing databases and deployment of Artificial Intelligence technologies to sweep through such data troves. This is indicated by several of the initiatives this study uncovered. Perhaps one that could be mentioned is the Brazilian initiative called SireneJud where data from multiple sources are gathered to provide insights to better understand the dynamics of protecting the environment.

A final challenge may not be present in all countries yet tends to impact significatively in the development of e-Justice initiatives, **governance of data as well as systems and coordination of efforts**. As the complexity of systems increases, so does the necessity to deploy strategies that can cope with the managing data points, data sources, different systems, distinct and sometimes autonomous institutions, not to mention several other systems and institutions that may interact and connect with the judicial system and benefit from the electronic processes and the data they provide.

The pace of development and complexity of the electronic justice systems the different countries have, appear to have a correlation with the way they have to face these aforementioned four challenges.

V. COMPARATIVE ANALYSIS

A. CONSTITUTIONAL FRAMEWORK OF THE JUDICIARY

1. General remarks

In order to provide the readers a comprehensible basis to familiarise with the subject matter of the present report and to create a fundamental benchmark for the comparative analysis, it is required to grapple with the fundamental determinants of the European Union and its member states as well as of Brazil. This concept guarantees the mutual transferability of best practices and recommendations and their implementation in accordance with the very principles and functioning of union or state structures respectively.

2. Constitutional framework

A. Brazil

1. Court organisation, normative and administrative roles in judicial matters

As a federal state, Brazil has a multifaceted judicial system operating on the state and federal levels, divided in two major groups "common justice" and "specialised justice". They are further divided into specific substantial material and territorial competences. Thus, representing a web of 91 different courts and tribunals and a Supreme Court: 27 state courts, 27 electoral courts, 24 labour courts, 5 federal regional courts, 3 military state courts, 1 Superior Military Court, 1 Superior Electoral Court, 1 Superior Labour Court and 1 Superior Court of Justice. On top of all of them there is the Supreme Federal Court.

The common justice has the broadest material competencies, having responsibility, by exclusion, over all matters that are not dealt with by the specialised courts. The common justice includes federal justice and state justice. Common federal justice is organised in all states of the federation and acts in cases in which the Union is a party. Each of the twenty-seven Brazilian states has its own judicial organisation, the state courts, responsible for acting in civil and criminal matters, and residually in all those that are not under the competence of the federal courts. There are also special federal courts which act in labour, electoral and military matters.

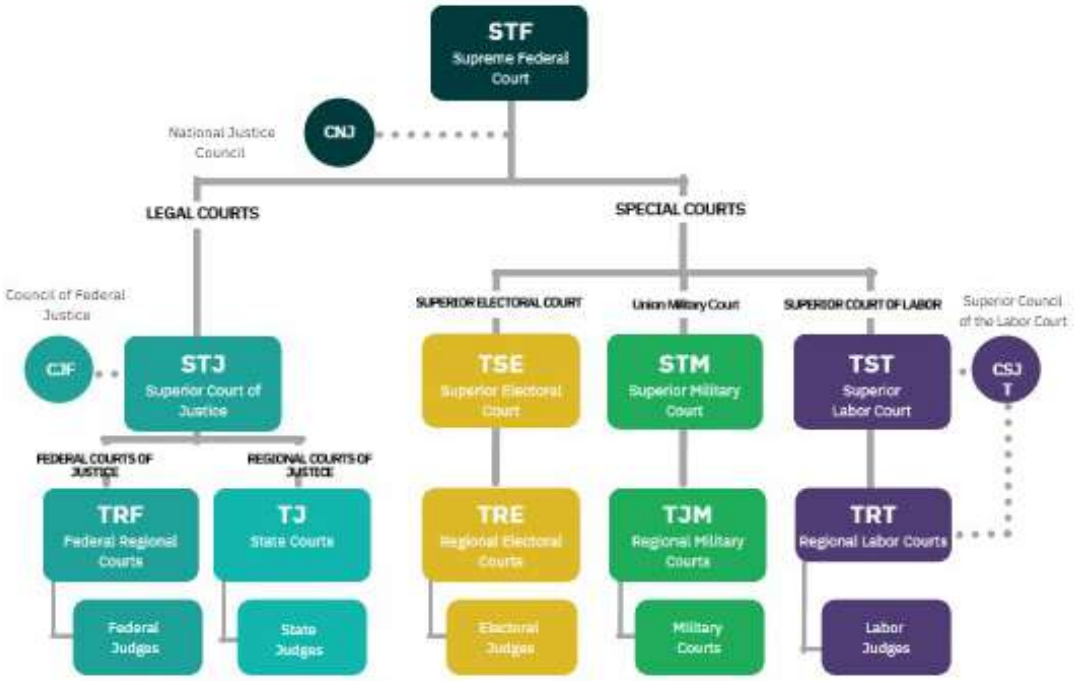
The 1988 Constitution guarantees a double degree of jurisdiction, which implies that, as a rule, in all segments of the Brazilian judiciary the proceedings begin with a first-degree judge, whose decisions are subject to review by a court. Thus, the common and specialised courts have regional courts, and the decisions of the courts can still be appealed to superior courts (in their respective fields). Finally, the decisions taken in any of the courts that violate federal legislation can be appealed to the Superior Court of Justice ("STJ"), which acts as final interpreter of federal laws. In the cases involving constitutional matters, the Federal Supreme Court (STF) acts as the final interpreter of the constitution.[25]

There is no hierarchy between federal and state courts, nor between first and second level judges, yet all, except for the Supreme Federal Court, are subject to the administrative and budgetary control exercised by the National Council of Justice – CNJ. The institution is responsible for the management of the judiciary, in tasks ranging from disciplinary and

25 See *Jusbrasil*, Sistema Judiciário Brasileiro: organização e competências, https://stf.jusbrasil.com.br/noticias/2535347/sistema-judiciario-brasileiro-organizacao-e-competencias [01/08/2022].

planning matters to provision of services and elaboration of legal policies. CNJ is the body that harmonises the practices of the judicial system, organising the provision of justice in Brazil.[26]

The policies and practice in terms of e-Justice, then, may be set by specific courts and tribunals, yet, very often are championed, proposed, and harmonised by CNJ[27] respecting the limits of autonomy of the different institutions that compose the whole system.



B. European Union

Since the Lisbon Treaty, it is, apart from the Treaty on the European Union (TEU), the Treaty on the Functioning of the European Union (TFEU) defining the basic principles of the Union.[28] Articles 2 et seq. TFEU, differentiate between exclusive, shared, and parallel competences of the Union and the member states. Article 81 (Judicial cooperation in civil matters) and article 82. TFEU (Judicial cooperation in criminal matters) serve as the main legal bases for the application of the Union's (shared) competence as to the regulation of (cross-border related) judicial matters and, subsequently, the digitalisation of justice. In doing so, the European Union's competence

26 This is according to art. 103-B, § 4° of the Brazilian Constitution as amended: http://www.planalto.gov.br/ccivil_03/constituicao/constituicao.htm [01/08/2022].

27 See also *CNJ*, Quem somos, https://www.cnj.jus.br/sobre-o-cnj/quem-somos/ [01/08/2022].

28 Consolidated version of the Treaty on the Functioning of the European Union, https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:12012E/TXT&from=EN [01/08/2022].

is limited by the principle of subsidiarity and proportionality pursuant to article 5 TEU,[29] and Protocol 2 on the application of the principles of subsidiarity and proportionality.[30] Pursuant to article 5 § 3 "under the principle of subsidiarity, in areas which do not fall within its exclusive competence, the Union shall act only if and in so far as the objectives of the proposed action cannot be sufficiently achieved by the Member States, either at central level or at regional and local level, but can rather, by reason of the scale or effects of the proposed action, be better achieved at Union level". In addition, in particular, article 16 TFEU (data protection) may come into question as the basis for legal action of the Union.

C. Austria

I. Competence for legislation and executive in judicial matters

Due to Austria's federal structure, it is to be determined under articles 10 to 15 of the Austrian Constitution[31] whether it is the federation or the federal states competent to regulate and to administer the issue relevant. Pursuant to article 10 § 6 of the Austrian Constitution, unlike the German system, ordinary justice (civil and criminal law) falls within the scope of federal legislation and administration. The consequence is a coherent system, which does not allow for exceptions which are very often intrinsically tied to federal state structures. Constitutional justice (article 10 § 1 of the Constitution) and administrative justice (article 10 § 1, article 11 § 2 of the Constitution) follow a separate (mainly federal) regime, apart from administrative court organisation of the federal states.

II. Court organisation

Pursuant to article 83 of the Austrian Constitution, the organisation and the competences of ordinary courts are regulated by ordinary law, which is, in fact, the Court Organisation Act. District courts and regional courts constitute the first instance in civil and criminal matters[32] while 4 courts of appeal review their decisions and therefore act as a second instance.[33] The

29 Consolidated version of the Treaty on European Union; https://eur-lex.europa.eu/resource.html?uri=cellar:2bf140bf-a3f8-4ab2-b506-fd71826e6da6.0023.02/DOC_1&format=PDF [01/08/22].

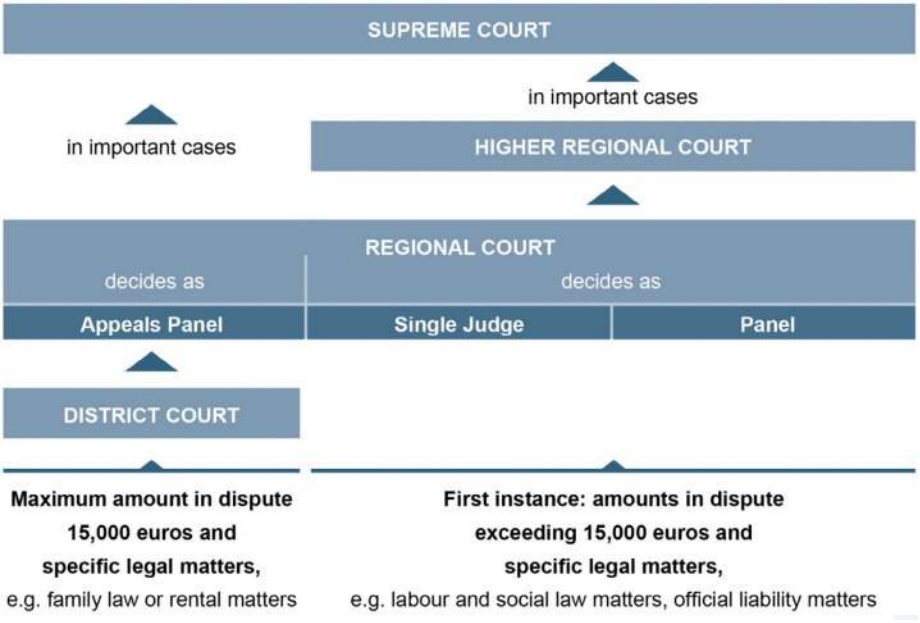
30 Protocol 2 on the application of the principles of subsidiarity and proportionality; https://ec.europa.eu/info/sites/default/files/protocol_no_2_on_the_application_of_the_principles_of_subsidiarity_and_proportionality_dec2004_en.pdf [01/08/2022].

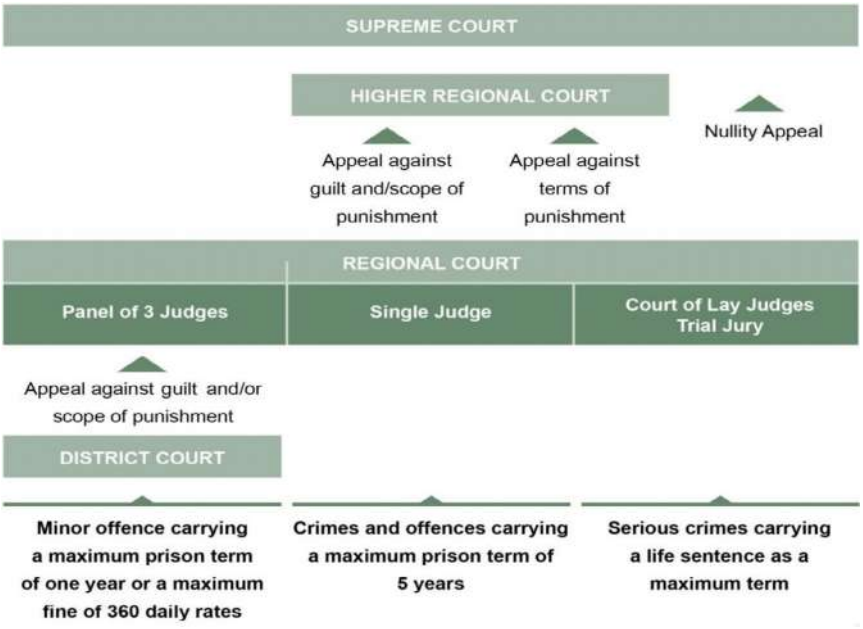
31 German term: "Bundes-Verfassungsgesetz" https://www.ris.bka.gv.at/Dokumente/Erv/ERV_1930_1/ERV_1930_1.pdf [01/08/2022].

32 Articles et seq. of the Court Organisation Act; https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=10000009 [01/08/2022].

33 Articles et seq. of the Court Organisation Act.

Supreme Court serves as the highest instance in ordinary judiciary.[34] Constitutional and administrative judiciary follow a different legal regime.[35] The tables below show the stages of appeal in civil (first graphic) and criminal (second graphic) proceedings.[36]





34 Article 1 § 1 of the Court Organisation Act.

35 Articles 144 et seq. and Articles 129 et seq. of the Constitution.

36 *Federal Ministry of Justice*, The Judiciary in Austria; https://www.justiz.gv.at/file/8ab4ac8322985dd501229d51f74800f7.de.0/pr%C3%A4sentation_justiz_(en)_stand_april_2021_pptx.pdf?forcedownload=true [01/08/2022].

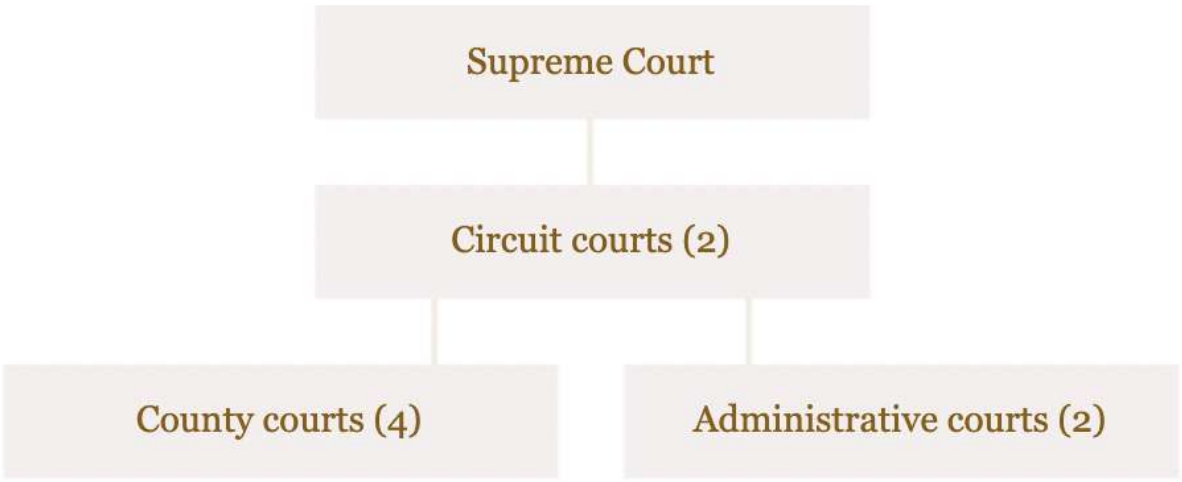
D. Estonia

I. Competence for legislation and administration in judicial matters

Unlike Austria and Germany, Estonia, pursuant to Article 2 of its Constitution,[37] is a unitary state, providing for the Parliament,[38] the President, the Government of the Republic, and the courts to be organised in accordance with the principles of separation and balance of powers.[39] Justice is administered exclusively by courts. Courts independently discharge their duties and administer justice in accordance with the Constitution and the laws.[40]

II. Court Organisation

The Estonian constitution of 1992 established a three-instance court system with different types of courts: County courts, city courts and administrative courts are the courts of first instance.[41] In fact, city courts were merged with



county courts by 1 January 2003, and the judges were assigned to the respective county courts as provided for in the Courts Act of 2002.[42] Circuit courts are higher courts which review

37 Estonian term: "Eesti Vabariigi põhiseadus"; https://www.riigiteataja.ee/en/eli/530102013003/consolide [01/08/2022].

38 Estonian term: "Riigikogu".

39 Article 4 of the Estonian Constitution.

40 Article 146 of the Estonian Constitution.

41 *Kask*, IT Solutions in Estonia, visit at Tallinn Circuit Court on 28/04/2022.

42 Article 138 of the Estonian Constitution.

rulings of the courts of first instance on appeal. While the Tallinn Court of appeal consists of 30 judges, the Tartu Court of appeal is the workplace for 16 judges.[43] The Supreme Court is the highest court of Estonia which reviews rulings of other courts pursuant to a quashing procedure. The Supreme Court is also the court of constitutional review.[44]

E. Germany

I. Competence for legislation and administration in judicial matters

Pursuant to article 70 of the Basic Law (the German Constitution),[45] the federal states[46] shall have the right to legislate insofar as the Basic Law does not confer legislative power on the federation. The Basic Law provides for exclusive competence[47] of the federation and concurring competence[48] between the federation and the states. Under article 74 of the Basic Law, civil law, criminal law, court organisation and procedure (except for the law governing pre-trial detention), inter alia, are to be subsumed under the concurring competence between the federation and the federal states. As long as and to the extent that the federation does not apply its legislative power, the states are entitled to enacting laws.[49] Contrary to the legislation, the German constitution is characterised by the principle of administration by the federal states.[50] Where the federal states execute federal laws, they are, in general, competent to establish authorities on their own.[51] The table below shows the complex organisation of the German court system.[52]

43 *Kask*, IT Solutions in Estonia, visit at Tallinn Circuit Court on 28/04/2022.

44 Article 149 of the Estonian Constitution.

45 Basic Law for the Federal Republic of Germany in the revised version published in the Federal Law Gazette Part III, classification number 100-1, as last amended by Article 1 of the Act of 29 September 2020 (Federal Law Gazette I p. 2048); https://www.gesetze-im-internet.de/englisch_gg/ [01/08/2022].

46 German term: "Länder".

47 Article 71 Basic Law.

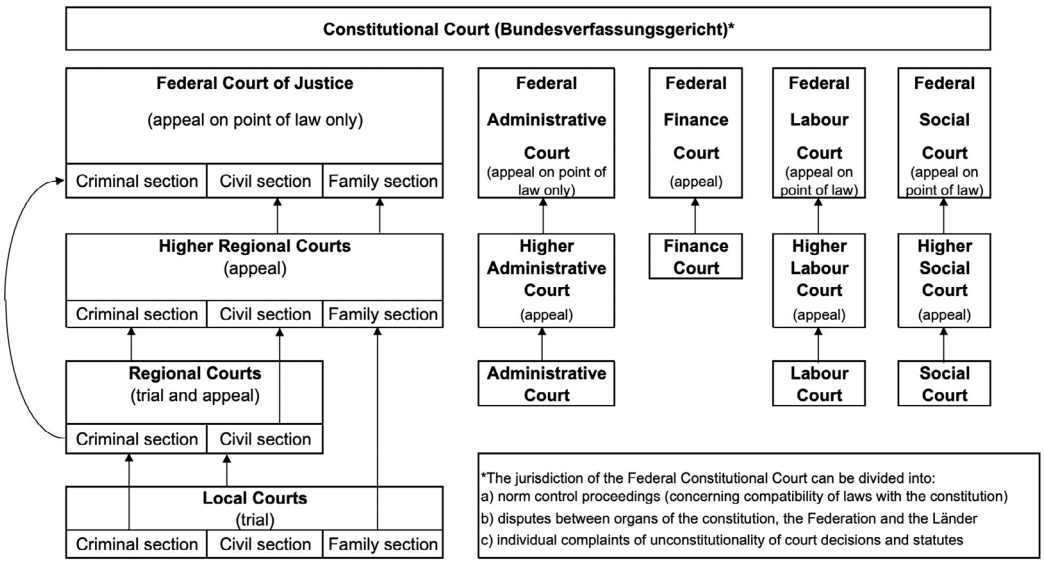
48 Article 72 Basic Law.

49 Article 72 § 1 Basic Law.

50 Article 83 Basic Law.

51 Article 85 Basic Law.

52 *Council of Europe*, Court System in Germany; https://rm.coe.int/court-system-in-germany-constitutional-court-bundesverfassungsgericht-/168078f809 [01/08/2022].



The appeal system in criminal, civil and family cases is complicated:

Criminal cases:	Appeals from local courts to regional courts, further appeal to higher regional courts
	Appeals from regional courts (trials, first instance) only to federal court of justice
Civil cases:	Appeals from local courts to regional courts, no further appeal
	Appeals from regional courts (first instance) to higher regional courts, further appeal to federal court of justice
Family cases:	Appeals from local courts to higher regional courts, further appeal to federal court of justice

(Appeals to federal court of justice are subject to further conditions)

3. Comparison and results

The organisational complexity of the constitutional or basic legal framework both in terms of competencies and judicial structures seems to provide different opportunities and challenges for the development of e-Justice policies and implement systems and solutions. This will be seen throughout the study.

It is important to highlight a few elements:

- Different institutions may have the competencies to set e-Justice policies and to implement them.
- Challenges may exist in terms of coordination and governance (they may rise in federal states).
- Specific institutions may join or not the electronic systems and/or can benefit from them (persecutions services, public defenders, attorneys may be a part of the e-Justice ecosystem or not).
- There are different approaches in terms of whether and how information, lessons, models, and technologies are shared.

B. PRINCIPLES AND LEGAL FRAMEWORK OF E-JUSTICE

1. General remarks

The successful implementation of e-Justice and the respective tools require, at first, a well-deliberated strategy containing core objectives, IT- guidelines and a vision to be realised. Some of the core objectives might be: Up-to-date digital services for citizens, representatives and judicial staff; acceleration and simplification of procedures through digitalisation; increase in efficiency and effectiveness; implementation of IT-projects on schedule and in the required quality; security of IT-solutions and a positive image of the judiciary.[53] Ensuring autonomous justice-IT ("interoperability"); support but no replacement of final judicial and administrative decision-making ("cognitive assistance"); maximising benefits for the entire judiciary ("holistic"); defining goals and solutions based on a long-term approach ("sustainability"); inclusion of new user groups without disadvantaging against existing ones ("digital by default"); recording procedural data only once and expanding interfaces ("only once-approach") can be mentioned as guiding principles when setting up a digital environment.[54]

2. Legal framework and recent proposals

One of the obstacles of a digital transformation is not only to find the proper technical solutions but also to identify and anticipate the legal requirements for their implementation. Since digital solutions tend to interact with fundamental rights or guarantees like data protection, the right to respect for private life, the right to receive information as well as fair trial guarantees, a strong legal basis is necessary to justify legal interventions or restrictions in the interest of the public.

A. Brazil

I. LAW 10.256/2001 of 12 July 2001 establishes the federal small claims courts ("juizados especiais cíveis e criminais em âmbito federal") and authorises the establishment of "informatic programs" to support them.[55]

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53 *Austrian Federal Ministry of Constitution, Reforms, Deregulation and Justice*, e-Justice Strategy 2018-2022 (2018) p.7; https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52019XG0313(01)&rid=7 [01/08/2022].

54 *Austrian Federal Ministry of Constitution, Reforms, Deregulation and Justice*, e-Justice Strategy 2018-2022 (2018) p.7; https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52019XG0313(01)&rid=7
[01/08/2022].

55 http://www.planalto.gov.br/ccivil_03/leis/leis_2001/l10259.htm
[01/08/2022].

II. LAW 11.419/2006 of 19 December 2016 establishes the bases for the electronic process in Brazil, as well as its procedural aspects.[56]

III. RESOLUTION 185/2013 OF THE NATIONAL JUSTICE OF COUNCIL of 18 December 2013 determines that the Electronic Judicial Process (PJe) system will be the Brazilian electronic process system.[57] There are several other systems employed by Brazilian courts and there have been several efforts towards interoperability among them.

IV. LAW 12.965/2014 of 23 April 2014 establishes guidelines for the performance of public institutions in the development of the internet in Brazil.[58] One of them is the provision of public services to citizens in an integrated, efficient, simplified way and through multiple access channels, including remote ones.

V. LAW 13.105/2015 of 15 March 2015 establishes the 2015 Code of Civil Procedure and replaces the 1973 Code of Civil Procedure.[59] The new code was born from an intense and broad legislative process, with the participation of different social actors. Adapted to the dynamic principles of the 1988 Constitution, it values the idea of contradictory, ample defence, and celerity. The new law is also in line with the reality of the digitalization of justice, mentioning, for example, the practice of procedural acts by electronic means.

VI. ORDINANCE 1/2015 OF THE NATIONAL COUNCIL OF JUSTICE of 4 August 2015 implements the Electronic Information System (SEI) as an electronic administrative process of the National Council of Justice.[60] This system is also used in several Brazilian courts.

VII. LAW 13.709/2018 of 14 August 2018 is the General Data Protection Law ("Lei Geral de Proteção de Dados Pessoais", "LGPD").[61] The LGPD (General Data Protection Law), inspired by the European GDPR (General Data Protection Regulation), came into force in 2020 and is the Brazilian legal framework on the processing of personal data. This law, while not directly addressing any specific technological tool, applies to both companies and the public sector. Its rules are essential in the design of the judiciary's technological solutions, after all, most of them deal directly with personal and sensitive data of citizens, which is why they must be transparent and secure.

VIII. RESOLUTION 693/2020 OF THE SUPREME FEDERAL COURT of 17 July 2020 disciplines the operation of electronic judicial proceedings within the scope of the Court.[62]

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56 http://www.planalto.gov.br/ccivil_03/_ato2004-2006/2006/lei/l11419.htm [01/08/2022].

57 https://atos.cnj.jus.br/atos/detalhar/1933#:~:text=Institui%20o%20Sistema%20Processo%20Judicial,para%20sua%20implementa%C3%A7%C3%A3o%20e%20funcionamento [01/08/2022].

58 http://www.planalto.gov.br/ccivil_03/_ato2011-2014/2014/lei/l12965.htm [01/08/2022].

59 http://www.planalto.gov.br/ccivil_03/_ato2015-2018/2015/lei/l13105.htm [01/08/2022].

60 https://atos.cnj.jus.br/atos/detalhar/2168#:~:text=R%20E%20S%20O%20L%20V%20E%3A-,Art.,Par%C3%A1grafo%20%C3%BAnico [01/08/2022].

61 http://www.planalto.gov.br/ccivil_03/_ato2015-2018/2018/lei/l13709.htm [01/08/2022].

62 https://www.stf.jus.br/ARQUIVO/NORMA/RESOLUCAO693-2020.PDF [01/08/2022].

IX. RESOLUTION 331/2020 OF THE NATIONAL COUNCIL OF JUSTICE of 20 August 2020 defines Datajud as the reference system for the integration of procedural data in the country.[63] It also explains the concepts of metadata and API, for example.

X. RESOLUTION 332/2020 OF THE NATIONAL COUNCIL OF JUSTICE of 21 August 2020 presents a broad overview of the uses of artificial intelligence in the Brazilian judiciary, defining concepts such as models of artificial intelligence, in addition to establishing ethical precepts.[64] The norm values diversity and the fight against prejudice from the formation of the teams that create AI tools to the way these tools act, highlighting the need for human review and data security.

XI. RESOLUTION 334/2020 OF THE NATIONAL COUNCIL OF JUSTICE of 21 September 2020 creates a committee that, among its functions, must evaluate and propose interoperability standards and the availability of data from judicial procedures through APIs that facilitate data reading by machines.[65] The committee must also establish charging parameters for access to judicial data, and suggest data security policies.

XII. RESOLUTION 335/2020 OF THE NATIONAL COUNCIL OF JUSTICE of 29 September 2020 creates the Digital Platform of the Brazilian Judiciary – PDPJ-Br, which purpose is to integrate all courts in the country, with the PJe being maintained as the country's priority electronic procedure system.[66] Besides integrating the electronic procedure systems, the goal is for PDPJ-Br to also provide AI and microservices solutions. In other words, PDPJ-Br will function as a means of integration and marketplace of solutions for the judiciary through cloud computing. The integration of the courts to PDPJ-Br is expected to be completed by June 2022.

XIII. RESOLUTION 345/2020 OF THE NATIONAL COUNCIL OF JUSTICE of 9 October 2020 determines the possibility of the parties of a lawsuit to opt for the processing and practising of all procedural acts in a 100% digital manner, creating the "100% Digital Court".[67] In this modality each procedural act takes place virtually, from the service to the hearings.

XIV. RESOLUTION 349/2020 OF THE NATIONAL COUNCIL OF JUSTICE of 23 October 2020 creates the Judicial Power Intelligence Centre ("CIPJ") to propose the adequate treatment of strategic or repetitive and mass claims in the Brazilian Judiciary.[68]

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63 https://atos.cnj.jus.br/atos/detalhar/3428 [01/08/2022].

64 https://atos.cnj.jus.br/atos/detalhar/3429#:~:text=Qualquer%20solu%C3%A7%C3%A3o%20computacional%20do%20Poder,finais%20e%20para%20a%20sociedade [01/08/2022].

65 https://atos.cnj.jus.br/atos/detalhar/3489#:~:text=1%C2%BA%20Fica%20institu%C3%ADdo%20o%20Comit%C3%AA,pessoais%20no%20%C3%A2mbito%20do%20Poder [01/08/2022].

66 https://atos.cnj.jus.br/atos/detalhar/3496 [01/08/2022].

67 https://atos.cnj.jus.br/atos/detalhar/3512 [01/08/2022].

68 https://atos.cnj.jus.br/files/original131706202010285f996f527203d.pdf [01/08/2022].

XV. RESOLUTION 354/2020 OF THE NATIONAL COUNCIL OF JUSTICE of 19 November 2020 establishes the concepts and rules for holding videoconferences, telepresence hearings and the practising of procedural acts of summons and subpoena by electronic means.[69]

XVI. RESOLUTION 358/2020 OF THE NATIONAL COUNCIL OF JUSTICE of 2 Dezember 2020 determines that the courts must create a computerised system for conflict resolution through conciliation and mediation.[70]

XVII. ORDINANCE 271/2020 OF THE NATIONAL COUNCIL OF JUSTICE of 4 Dezember 2020 defines that artificial intelligence projects in the judiciary will be focused on process automation, massive data analysis and support in decision-making and preparation of legal documents.[71] The Synapses became the artificial intelligence platform of the judiciary, centralising information and AI models used in the country.

XVIII. RECOMMENDATION 99/2021 OF THE NATIONAL COUNCIL OF JUSTICE of 21 May 2021 recommends that judges use remote sensing data and information obtained by satellite in conjunction with the other elements of the evidential context, when necessary for the evidentiary instruction of civil and criminal environmental actions.[72]

XIX. JOINT RESOLUTION 8/2021 OF THE NATIONAL COUNCIL OF JUSTICE and the NATIONAL COUNCIL OF PUBLIC PROSECUTION of 25 June 2021 establishes the national interactive panel of environmental and inter-institutional data – SireneJud.[73]

XX. RESOLUTION 363/2021 OF THE NATIONAL COUNCIL OF JUSTICE of 12 January 2021 creates the Committees responsible for making the courts comply with the General Personal Data Protection Law.[74] These committees must identify what personal data is processed in the courts, for what purpose and, based on this, identify the vulnerabilities found and propose solutions.

XXI. RESOLUTION 370/2021 OF THE NATIONAL COUNCIL OF JUSTICE of 28 January 2021 sets out a series of goals that the Judiciary must achieve by 2026: increase user satisfaction, promote digital transformation, recognise and develop employee competencies, seek innovation and collaboration, improve governance and management, improve acquisitions and hiring, improve information security and data management, promote infrastructure services and corporate solutions.[75]

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69 https://atos.cnj.jus.br/atos/detalhar/3579 [01/08/2022].

70 https://atos.cnj.jus.br/atos/detalhar/3604 [01/08/2022].

71 https://atos.cnj.jus.br/atos/detalhar/3613#:~:text=Regulamenta%20o%20uso%20de%20Intelig%C3%AAncia%20Artificial%20no%20%C3%A2mbito%20do%20Poder%20Judici%C3%A1rio [01/08/2022].

72 https://atos.cnj.jus.br/atos/detalhar/3940 [01/08/2022].

73 https://atos.cnj.jus.br/files/original153911202107016 0dde19fac7ef.pdf [01/08/2022].

74 https://atos.cnj.jus.br/atos/detalhar/3668 [01/08/2022].

75 https://atos.cnj.jus.br/atos/detalhar/3706

XXII. RESOLUTION 372/2021 OF THE NATIONAL COUNCIL OF JUSTICE of 12 February 2021 determines the creation of the "Virtual Counter" which, in practice, means that each judicial court office must provide information by virtual means.[76] The service may be provided by video platforms such as Zoom or Teams, or by messaging applications.

XXIII. LAW 14.129/2021 of 29 March 2021 creates the basis for digital transformation in the provision of public services.[77] It is applied by all entities of the federation and facilitates interoperability between systems of various bodies.

XXIV. RESOLUTION 385/2021 OF THE NATIONAL COUNCIL OF JUSTICE of 6 April 2021 establishes the general rules for the organisation of "Justice 4.0 Centres", where digital lawsuits are judged.[78] These centres may be created by the courts to address specific issues in territories delimited in a different way from the traditional judicial courts.

XXV. RESOLUTION 395/2021 OF THE NATIONAL COUNCIL OF JUSTICE of 7 June 2021 establishes the need to continuously foster a culture of innovation in the Judiciary.[79] To this end, the "Innovation Lab of the National Council of Justice'' and the "Innovation Network of the Brazilian Judiciary" (Renovajud) are created.

XXVI. ORDINANCE 4.979/2021 OF THE MINISTRY OF SCIENCE, TECHNOLOGY AND INNOVATIONS of 13 July 2021 establishes the Brazilian Strategy for Artificial Intelligence (EBIA).[80] Aligned with the OECD guidelines endorsed by Brazil, EBIA is based on the principles defined by the Organisation for the responsible management of AI systems.

XXVII. ORDINANCE 211/2021 OF THE NATIONAL COUNCIL OF JUSTICE of 2 September 2021 establishes basic criteria that will serve as a basis for the analysis of the maturity level of technology management in the Judiciary, as established by Resolution 370/2021.[81] The survey will be carried out annually through the Information and Communication Technology Governance, Management and Infrastructure of the Judiciary Index (iGovTIC-JUD).

XXVIII. RESOLUTION 420/2021 OF THE NATIONAL COUNCIL OF JUSTICE of 29 September 2021 establishes as a rule the receipt of only electronic judicial procedures in all courts in

[01/08/2022].

76 https://atos.cnj.jus.br/atos/detalhar/3742 [01/08/2022].

77 http://www.planalto.gov.br/ccivil_03/_ato2019-2022/2021/lei/l14129.htm [01/08/2022].

78 https://atos.cnj.jus.br/atos/detalhar/3843 [01/08/2022].

79 https://atos.cnj.jus.br/atos/detalhar/3973 [01/08/2022].

80 https://antigo.mctic.gov.br/mctic/opencms/legislacao/portarias/Portaria_MCTI_n_4979_de_13072021.html [01/08/2022].

81 https://atos.cnj.jus.br/atos/detalhar/4100#:~:text=Disp%C3%B5e%20sobre%20o%20%C3%8Dndice%20de,Judici%C3%A1rio%20(iGovTIC%2DJUD).&text=DJe%2FCNJ%20n%C2%B0%20229,2%2D42.&text=O%20Anexo%20foi%20republicado%20no,de%20setembro%20de%202021%2C%20p [01/08/2022].

the country, with the exception of the STF, from March 2022. It also determines that by December 2025 all physical processes must be digitised.[82]

XXIX. RESOLUTION 433/2021 OF THE NATIONAL COUNCIL OF JUSTICE of 27 October 2021 establishes the National Policy of the Judiciary for the Environment.[83] This policy creates a series of guidelines for the magistrates and workers of the Brazilian judiciary on environmental issues, highlighting continuous training in this area, inter-institutional action, and the creation of centres specialised in environmental issues, among others.

B. European Union

I. REGULATION (EU) 2021/693 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 28 April 2021 establishing the Justice Programme and repealing Regulation (EU) No 1382/2013.[84]

II. REGULATION (EU) 2021/694 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 29 April 2021 establishing the Digital Europe Programme and repealing Decision (EU) 2015/2240.[85]

III. REGULATION (EU) 2015/848 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 20 May 2015 on insolvency proceedings (recast).[86]

IV. DIRECTIVE (EU) 2017/1132 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 14 June 2017 relating to certain aspects of company law (codification).[87]

V. DIRECTIVE 2010/64/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 20 October 2010 on the right to interpretation and translation in criminal proceedings.[88]

VI. REGULATION (EU) 2020/1783 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 25 November 2020 on cooperation between the courts of the Member States in the taking of evidence in civil or commercial matters (taking of evidence) (recast).[89]

VII.

82 https://atos.cnj.jus.br/atos/detalhar/4133 [01/08/2022].

83 https://atos.cnj.jus.br/files/original140419202111103618296e30894e.pdf [01/08/2022].

84 https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32021R0693&from=EN [01/08/2022].

85 https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32021R0694&from=EN [01/08/2022].

86 https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32015R0848 [01/08/2022].

87 https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32017L1132 [01/08/2022].

88 https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32010L0064 [01/08/2022].

89 https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32020R1783 [01/08/2022].

VIII. REGULATION (EU) 2020/1784 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 25 November 2020 on the service in the Member States of judicial and extrajudicial documents in civil or commercial matters (service of documents).[90]

IX. REGULATION (EU) 2022/850 OF THE EUROPEAN PARLIAMENT AND THE COUNCIL of 30 May 2022 on a computerised system for the cross-border electronic exchange of data in the area of judicial cooperation in civil and criminal matters (e-CODEX system), and amending Regulation (EU) 2018/1726.[91]

X. DIRECTIVE 2014/41/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 3 April 2014 regarding the European Investigation Order in criminal matters.[92]

XI. Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL, COM(2021) 759 final, on the digitalisation of judicial cooperation and access to justice in cross-border civil, commercial and criminal matters, and amending certain acts in the field of judicial cooperation.[93]

XII. Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL, COM/2021/760 final, amending Council Directive 2003/8/EC, Council Framework Decisions 2002/465/JHA, 2002/584/JHA, 2003/577/JHA, 2005/214/JHA, 2006/783/JHA, 2008/909/JHA, 2008/947/JHA, 2009/829/JHA and 2009/948/JHA, and Directive 2014/41/EU of the European Parliament and of the Council, as regards digitalisation of judicial cooperation.

XIII. Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL, COM(2021) 757 final, amending Regulation (EU) 2018/1727 of the European Parliament and the Council and Council Decision 2005/671/JHA, as regards the digital information exchange in terrorism cases.[94]

XIV. Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL, COM(2021) 767 final, amending Council Decision 2005/671/JHA, as regards its alignment with Union rules on the protection of personal data.[95]

XV. Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL, COM(2021) 756 final, establishing a collaboration platform to support the functioning of Joint Investigation Teams and amending Regulation (EU) 2018/1726.[96]

XVI. Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL, COM/2021/851 final, on the protection of the environment through criminal law and replacing Directive 2008/99/EC.[97]

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90 https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32020R1784 [01/08/2022].
91 https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32022R0850 [01/08/2022].
92 https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32014L0041 [01/08/2022].
93 https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021PC0759 [01/08/2022].
94 https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52021PC0757 [01/08/2022].
95 https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52021PC0767 [01/08/2022].
96 https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52021PC0756 [01/08/2022].
97 https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52021PC0851 [01/08/2022].

XVII. Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL, COM/2021/206 final, laying down harmonised rules on Artificial Intelligence (Artificial Intelligence Act) and amending certain Union legislative acts[98]

XVIII. EUROPEAN PARLIAMENT RESOLUTION of 25 March 2021 on a European strategy for data (2020/2217[INI]) (2021/C 494/04).[99]

XIX. 2019-2023 Action Plan European e-Justice (2019/C 96/05).[100]

XX. 2019-2023 Strategy on e-Justice (2019/C 96/04).[101]

C. Council of Europe

I. Convention for the protection of individuals with regard to the processing of personal data.[102]

II. European ethical Charter on the use of Artificial Intelligence in judicial systems and their environment.[103]

III. Committee on Artificial Intelligence (CAI) set up by the Committee of Ministers under Article 17 of the Statute of the Council of Europe and in accordance with Resolution CM/Res (2021) 3 on intergovernmental committees and subordinate bodies, their terms of reference and working methods.[104]

D. Austria

I. General remarks

While the Minister of Justice, in fact, the Department of Legal Informatics, Information and Communication Technology, except for the Supreme Court, is responsible for the ICT

98 https://eur-lex.europa.eu/resource.html?uri=cellar:e0649735-a372-11eb-9585-01aa75ed71a1.0001.02/DOC_1&format=PDF [01/08/2022].

99 https://www.europarl.europa.eu/doceo/document/TA-9-2021-0098_EN.pdf [01/08/2022].

100 https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52019X-G0313(02)&qid=1654870016382&from=EN [01/08/2022].

101 https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52019XG0313(01)&qid=1654870016382&-from=EN [01/08/2022].

102 https://rm.coe.int/convention-108-convention-for-the-protection-of-individuals-with-regar/16808b36f1 [01/08/2022].

103 https://rm.coe.int/ethical-charter-en-for-publication-4-december-2018/16808f699c [01/08/2022].

104 CAI – Committee on Artificial Intelligence https://www.coe.int/en/web/artificial-intelligence/cai#%7B%22126720142%22:%5B0 [01/08/2022].

strategy, coordination as well as for the provision of infrastructure and the digital environment, the courts of appeal are incumbent on IT administration, support and training. The Federal Computing Centre is competent for the development, operation and maintenance of ICT and digital applications.

II. Supreme Court Act

The Supreme Court Act does not contain explicit provisions concerning digitalisation, but some of them[105] concern the publication of Supreme Court judgments on the Legal Information Platform.[106] These regulations also determine the requirements of anonymisation of published Supreme Court judgments and have repercussions on AI-based anonymisation tools.

III. Court Organisation Act

The Court Organisation Act is not only the predominant legal basis for the structure of justice and court organisation,[107] but also an important framework for electronic court case management, the processing of electronic files, electronic communication and, subsequently, the implementation of digital tools. Furthermore, it comprises provisions which refer to the Supreme Court Act in terms of publication of court decisions and their anonymisation.[108] The 2022 Amendment of Civil Procedure, based on the experiences in practice, implemented or adapted several provisions regarding digital file management and processing in the Court Organisation Act (digital file processing in civil proceedings and the integration of paper-based submissions into the digital file,[109] the handling of documents or evidence which cannot be scanned or integrated otherwise,[110] data protection,[111] the digital signature[112] and digital record access[113]).

105 Articles 15 and 15a of the Supreme Court Act; https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=10000449 [01/08/2022].

106 German term: “Rechtsinformationssystem des Bundes”; www.ris.bka.gv.at [01/08/2022].

107 Court Organisation Act; https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=10000009 [01/08/2022].

108 Article 48a of the Court Organisation Act.

109 Article 81a of the Court Organisation Act.

110 Article 81a of the Court Organisation Act.

111 Articles 83 et seq. of the Court Organisation Act.

112 Article 89c of the Court Organisation Act.

113 Article 89i of the Court Organisation Act.

IV. E-Government Act

Everyone has the right to electronic communication with courts and administrative bodies in matters of federal legislation excluded matters, which are not suitable to be provided electronically.[114] The E-Government Act also provides for an e-ID, which serves as proof of authentic identity, for example, in terms of court submissions.[115]

V. ELC Regulation

The Electronic Legal Communication Regulation codifies the formal process and requirements of electronic filing of submissions via Electronic Legal Communication or JusticeOnline, the date of service of documents as well as cybersecurity issues.[116]

VI. FCC Act

The Act on the Federal Computing Centre (FCC) describes the formation of FCC and, in particular, its competences as to ICT. FCC is an outsourced limited liability company owned by the Republic of Austria and based in Vienna, which was established by law by the end of 1996. It is responsible for the development, operation and service of information and communication technology assigned by law or contract.[117] The FCC is the most important provider and operator of IT-solutions for e-Government and e-Justice in Austria.[118]

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114 Article 1a of the Federal E-Government Act; https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=20003230 [01/08/2022].

115 Article 4 of the Federal E-Government Act.

116 Regulation of the Minister of Justice on Electronic Legal Communication; https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=20004493&FassungVom=2021-12-23 [01/08/2022].

117 Art. 1 of the Federal Act on the Austrian Federal Computing Centre; https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=10001466#:~:text=%C2%A7%201.,%E2%80%9EBRZ%20GmbH%E2%80%9C%20abgek%C3%BCrzt%20werden [01/08/2022].

118 Electronic Legal Communication, Court Case Management System, Business and Land Register, Official Digital Signature, Dual Service, Mail Processing Service; https://www.brz.gv.at/was-wir-tun/services-produkte.html [01/08/2022].

VII. Code of civil procedure

The 2022 Amendment of Civil Procedure also adapted several provisions of the Civil Procedure Act. Hence, the requirement of several copies of submissions was eliminated,[119] as well as the obligatory submission of official documents in favour of electronic copies,[120] and the signature on court minutes by the parties. It also allows for the scanning of original documents and the processing of electronic copies to the judges for assessing the procedural prerequisites.[121]

VIII. The First Covid Ancillary Act on Justice

Despite its provisionary character and the context of Covid-19, the act comprises important provisions concerning remote digital hearings before e-courts and taking of evidence.[122]

E. Estonia

I. General remarks

Like in Germany, the relevant provisions concerning electronic proceedings can be found in the respective procedural laws.

II. Code of Civil Procedure (CCP)

While the procedural rule for the (optional) use of digital files can be found in Article 57 of the Code of Civil Procedure,[123] it is Article 61 of the Code of Civil Procedure containing the authorisation to the Government to implement an "E-file proceedings information system" meeting several requirements laid down in Article 60 § 1 and § 2 of the Code of Civil Procedure (technical requirements and information to be stored). Article 311 of the Code of Civil Procedure specifies the rules for electronic service of official documents, Art. 336 of the Code of Civil

119 Art. 80 of the Code of Civil Procedure.

120 Art. 82 of the Code of Civil Procedure.

121 Art. 84 of the Code of Civil Procedure.

122 Art. 3 of the First Covid Ancillary Act on Justice; https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=20011087 [01/08/2022].

123 Code of Civil Procedure, RT I, 22.12.2021, 2; https://www.riigiteataja.ee/en/eli/ee/Riigikogu/act/531122021001/consolide; original title: "Tsiviilkohtumenetluse seadustik"; https://www.riigiteataja.ee/akt/122122021023 [01/08/2022].

Procedure concerns the electronic submission of documents, which is, in both cases, obligatory for legal professionals.

III. Code of Criminal Procedure

The respective provisions are laid down in Art. 160¹ of the Code of Criminal Procedure.[124] Pursuant to Art. 160² § 1 of the Code of Criminal Procedure, the system files are to be processed electronically via the e-file system, under Art. 160² § 3, legal professionals are subjected to the use of the e-file system.

IV. Criminal Records Database Act

The electronic Criminal Records Database is part of the E-file proceedings information system and regulates the purpose, the data stored (convictions and sentences), the access to the data, its deletion as well as the maintenance and responsibilities for the database.[125]

V. Electronic Identification and Trust Services for Electronic Transactions Act

For the purposes of implementation of electronic identification as well as signature, the act transposed the standards of eIDAS Regulations into national law.[126] Therefore, the mandatory electronic ID cards for citizens is not only serving for identification matters but also facilitates electronic procedures.[127]

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124 Code of Criminal Procedure, RT I, 22.12.2021, 44; https://www.riigiteataja.ee/en/eli/ee/Riigikogu/act/527122021006/consolide; original title: "Kriminaalmenetluse seadustik"; https://www.riigiteataja.ee/akt/122122021045 [01/08/2022].

125 Criminal Records Database Act; https://www.riigiteataja.ee/en/eli/501042019021/consolide; original title: "Karistusregistri seadus"; https://www.riigiteataja.ee/akt/113032019076 [01/08/2022].

126 Electronic Identification and Trust Services for Electronic Transactions Act https://www.riigiteataja.ee/en/eli/527102016001/consolide; original title: "E-identimise ja e-tehingute usaldusteenuste seadus"; https://www.riigiteataja.ee/akt/125102016001 [01/08/2022].

127 *European Commission*, Digital Public Administration fact sheet 2021 Estonia; https://joinup.ec.europa.eu/sites/default/files/inline-files/DPA_Factsheets_2021_Estonia_vFinal.pdf [01/08/2022].

F. Germany

I. General Remarks

Due to its strongly developed federal structure the focus of federal laws in e-Justice matters lies on communication and cooperation. In the past years, the federation intensified to make use of its (shared) competence to implement several laws on e-Justice. Unlike Austria, the rules on electronic communication with courts are codified in the respective procedural laws.

II. Act on the promotion of electronic communication with courts of 10 October 2013

This act adapted several procedural laws in civil, administrative and misdemeanour matters (electronic submission and signature, evidential value of official documents, electronic service of documents) and subjected professional parties to the use of electronic communication.[128]

III. Act on the implementation of electronic files and the further promotion of Electronic Legal Communication of 5 July 2017

The act proposed, in particular, to also include the Code of criminal procedure in the electronic legal communication system. In addition, from 2026 onwards, courts will be obliged to process files digitally, while the state governments are empowered to issue deviating regulations in terms of paper file backlogs.[129] Since 1 January 2022, lawyers and authorities have been subjected to electronically submit documents in criminal matters.[130]

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128 Act on the implementation of electronic files and the further promotion of Electronic Legal Communication of 5 July 2017, original title: "Gesetz zur Förderung des elektronischen Rechtsverkehrs", BGBl. I 62/2013; https://www.bgbl.de/xaver/bgbl/start.xav?startbk=Bundesanzeiger_BGBl&start=//*%5b@attr_id=%27bgbl113s3786.pdf%27%5d#__bgbl__%2F%2F*%5B%40attr_id%3D%27bgbl113s3786.pdf%27%5D__1655065466738 [01/08/2022].

129 Act on the Introduction of the Electronic File in the Judiciary and the further promotion of Electronic Legal Communication, BGBl. I 45/2017; original title: "Gesetz zur Einführung der elektronischen Akte in der Justiz und zur weiteren Förderung des elektronischen Rechtsverkehrs"; https://www.bgbl.de/xaver/bgbl/start.xav?start=//%2A%5B%40attr_id%3D%27bgbl117s2208.pdf%27%5D#__bgbl__%2F%2F*%5B%40attr_id%3D%27bgbl117s2208.pdf%27%5D__1659375913165 [01/08/2022].

130 Act on the Introduction of the Electronic File in the Judiciary and the further promotion of Electronic Legal Communication, BGBl. I 62/2013; see Article 130d Code of Civil Procedure; Article 65d Social Court Act, Article 46g Labour Court Act.

IV. Act on the further roll-out of electronic communication with courts of 5 October 2021

The act mainly concerns the secure electronic and conventional service of official documents under the Code of civil procedure as well as the date and the proof of service.[131]

V. Regulation on the technical requirements of Electronic Legal Communication and the electronic authority mailbox (Regulation on Electronic Legal Communication) of 24 November 2017

The regulation on Electronic Legal Communication comprises technical provisions like the format and size of data, identification electronic signature or authority and private electronic mailboxes for legal communication.[132]

VI. Act on the intensified use of video conference technology in court and public prosecution procedures of 25 April 2013

The act also amended different procedural laws (civil, social, criminal, administrative) and allows for remote hearings or questioning of witnesses under certain circumstances.[133]

VII. Agreement on the establishment of the E-Justice-Council and the principles of cooperation in terms of the use of information technology in Justice.

Based on Article 91c Basic Law, the federation and the federal states have adopted an agreement on the establishment of the E-Justice-Council and the principles of cooperation in terms of the use of information technology in justice.[134] The Commission of the Federation and

131 Act on the further roll-out of electronic communication with courts and amendments of further provisions, BGBl. I 71/2021; original title: "Gesetz zum Ausbau des elektronischen Rechtsverkehrs mit den Gerichten und zur Änderung weiterer Vorschriften"; https://www.bgbl.de/xaver/bgbl/start.xav?startbk=Bundesanzeiger_BGBl&start=//*[@attr_id=%27bgbl121s4607.pdf%27]#__bgbl__%2F%2F*%5B%40attr_id%3D%27bgbl121s4607.pdf%27%5D__1659376291926 [01/08/2022].

132 Regulation on the technical requirements of Electronic Legal Communication and the electronic authority mailbox (Regulation on Electronic Legal Communication); original title: "Verordnung über die technischen Rahmenbedingungen des elektronischen Rechtsverkehrs und über das besondere elektronische Behördenpostfach (Elektronischer-Rechtsverkehr-Verordnung - ERVV)"; https://www.gesetze-im-internet.de/ervv/BJNR380300017.html [01/08/2022].

133 Act on the intensified use of video conference technology in court and public prosecution procedures, BGBl. I 20/2013; original title: "Gesetz zur Intensivierung des Einsatzes von Videokonferenztechnik in gerichtlichen und staatsanwaltschaftlichen Verfahren"; https://www.bgbl.de/xaver/bgbl/start.xav?startbk=Bundesanzeiger_BGBl&start=//*%5b@attr_id=%27bgbl113s0935.pdf%27%5d#__bgbl__%2F%2F*%5B%40attr_id%3D%27bgbl113s0935.pdf%27%5D__1655108170847 [01/08/2022].

134 Justice Portal of the Federation and the Federal states, E-Justice-Council – Composition and du-

the Federal States for Information Technology in the Judiciary acts as a permanent working group and supports the E-Justice-Council.[135]

The E-Justice-Council is responsible for coordination related to the planning, the establishment and operation of information systems of judiciary, the setting of IT, IT-interoperability and IT-security standards, recommendations as well as reports to the conference of the Ministers of Justice of the federation and the federal states, and the participation of the judiciary in the IT-planning-Council.[136]

C. DIGITALISATION OF JUSTICE

1. General remarks

The digitalisation of documents and processes in the government are a global phenomenon, so is specifically in the judiciary. It is important to note that its development throughout the different countries has not been uniform. The recent pandemic with the closing of numerous public services had the indirect effect of providing an impetus to ongoing efforts and igniting new ones, not to mention the overall feeling in society that digital services could be provided efficiently.

In general, three aspects seem to be at the forefront of the digitalisation efforts of the judicial system: (i) the digitisation of documents and the possibility of dealing with them at level of data; (ii) the digitalisation of the judicial processes and proceedings allowing for a lighter interface and diminishing the bureaucratic steps, including here automation; and (iii) digital services and interfaces that allow for other institutions, public as well as private, and the citizens to digitally interact, have access to information and participate in proceedings.

ties; https://justiz.de/laender-bund-europa/e_justice_rat/zusammensetzung/index.php and https://www.justiz.nrw.de/JM/jumiko/beschluesse/2012/fruehjahrskonferenz12/I_11.pdf [01/08/2022].

135 Justice Portal of the Federation and the Federal States, E-Justice-Council – Composition and duties, https://justiz.de/laender-bund-europa/e_justice_rat/zusammensetzung/index.php [01/08/2022].

136 Justice Portal of the Federation and the Federal States, E-Justice-Council – Composition and duties, https://justiz.de/laender-bund-europa/e_justice_rat/zusammensetzung/index.php [01/08/2022].

2. Digitalisation of justice in general

A) Brazil

I. General remarks

The digitisation of the Brazilian judiciary is not only the result of the use of technology, but also of the combination between focus on the judicial process, changes in procedural legislation and reforms in the judiciary itself.[137] This statement can be observed by the initial focus on monitoring procedural acts and converting physical processes into digital ones, through the approval of laws that value the digitization of procedural acts, as is the case of the Civil Procedure Code of 2015 and also of the approval of Constitutional Amendment 45/2004 (EC 45/2004), which reformed the Judiciary and created the National Council of Justice. Thus, the digitization of the Brazilian judiciary should also be understood in the context of the cultural and legislative changes that have occurred in recent decades.

II. Historical Development

The digitisation of the Brazilian judiciary started particularly as a way to modernise the internal flow of work within the justice system. Information and communication technologies have been introduced so that the institution could better cope with an increasing social demand for its services.

The spread of the internet only added an extra layer of relevance to the technological focus that had already started. As landmark events of the 1990s we can highlight the launch of the first court websites[138] that allowed for access to fundamental information for the actors of the judicial system as much as the citizens in general. Another mark was the introduction of the "*push system*"[139] which established a fundamental premise for future technological developments: the possibility for the parties to be automatically notified about the progress of the cases in which they act.

In the first decade of the 2000s the CNJ (EC 45/2004), with the mandate to oversee the budgetary and administrative matters. Yet, the focus on electronic justice came incrementally

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137 One should note that with the Brazilian Constitution of 1988 and the expansion of the rights and guarantees protected, the judiciary played a fundamental role in society. This had an impact in the number of lawsuits filed; *AMAGIS*, Constituição Federal de 1988, https://amagis.com.br/posts/constituicao-federal-de-1988-ha-20-anos-um-marco-hoje-um-desafio-para-o-judiciario [01/08/2022].

138 https://www.stj.jus.br/sites/portalp/Institucional/Historia/A-era-digital [08/06/2022].

139 It is a pioneer system used by Brazilian courts in which the lawyer is notified of different information about cases and courts. Through it, for example, the lawyer receives automatic notifications about movements in the cases he or she is acting in.

and now the institution is central in setting national e-Justice policies, and by guiding the development of the electronic process.

Parallel efforts were taken in many of the country's tribunals not only digitising paper records but to develop electronic proceedings.[140] 2004 marks the introduction of the first tracking systems. Yet, it was only in 2006, with the Law 11.419/2006[141] that the implementation of electronic processes was regulated throughout the country, moving the focus from the simple digitisation of paper records to the possibility of performing procedural acts in an originally virtual manner. It was also in this decade that began the dissemination of the publication of procedural acts through the Electronic Justice Gazette, which was no longer printed.

The period starting in the early 2010s was marked by a rapid dissemination of digitisation tools in the judiciary, with the different autonomous tribunals developing their own solutions. This situation forged many different systems that lacked common standards and had little or no interoperability. They could be described as "isolated islands" with limited interaction among themselves.

The period created the opportunity as well for tribunals to seek ways to harmonise the means of exchanging information among themselves and other institutions that are part of the judicial ecosystem such as the Prosecutions Services, the Brazilian Office of the General Attorney ("AGU"), among others. This led to efforts to create, for instance, a national interoperability model such as the "MNI" ("*Modelo Nacional de interoperabilidade*"),[142] which standardises the terminology used to identify the electronic documents and allows for different organs to "interpret" the actions of electronic procedures.

In 2013, in a national initiative, the CNJ launched a national uniform system, the Electronic Judicial Process ("Pje", "*Processo Judicial eletrônico*"). The intention was to provide uniformity and pave the way for a common structure, which should have gains of efficiency and economicity. The initiative, however, was considered not suitable for some courts in the country, particularly large ones, which had already made considerable investments in their own platforms. Nonetheless, several courts adopted the PJe, however, many also altered and adapted it to their own specific needs.

In 2017,[143] facing what could be described as an "archipelago" of different solutions and systems, the approach changed from unification of the systems *via* Pje to interoperability of systems already in place. To this end, several strategies have been developed in order to create means to facilitate the use of automated means – with or without artificial intelligence

140 Digitalisation efforts started early at the federal justice system as the regulation that instituted the federal small claims tribunals provided the possibility of instituting electronic proceedings and processes (Law 10.219/2001); http://www.planalto.gov.br/ccivil_03/leis/leis_2001/l10259.htm [01/08/2022].

141 Establishes the bases for the electronic process in Brazil, as well as its procedural aspects.

142 *CNJ*, Modelo de Interoperabilidade de Dados do Poder Judiciário e Órgãos de Administração da Justiça; https://www.cnj.jus.br/wp-content/uploads/2015/05/interoperabilidade_2.2.2.pdf [08/06/2022].

143 In 2017, CNJ chose to repeal the section of Resolution 185/2013 that prevented courts from deploying systems other than PJe. This decision came about to reduce friction with large state courts that were resistant to implementing PJe, based on the argument that they had already made large investments in the electronic process systems they used.

technologies – and to integrate and manage data from different electronic process systems, adding more and more functionalities to them.

III. Current status: The Judicial System as a Platform

The different initiatives that occurred during the digitisation process of the Brazilian judiciary always sought to solve the demands of the times for more efficiency and to deal with the rising workload. The development of solutions, as mentioned before, associated with the structure of the country's justice system, ended up producing many initiatives at different courts and tribunals, yet often could be scaled nationally to solve common national problems. The former either spontaneous or more centralised initiatives to create national systems and standards have been only partially successful having not produced the level of uniformity and common solutions as expected.

As of 2021, the approach chosen has been to create a global program that aims at serving as a path to an interoperable national system where all courts can share resources and strive towards common grounds. Under the one of the five axes of the Presidency of Chief Justice of the Brazilian Supreme Court Luiz Fux,[144] CNJ has consolidated different initiatives under the Justice 4.0 program[145], which is a paradigm shift, encouraging the constant development of shared solutions for common demands through both a bottom-up and a top-down approach.

The structure of judiciary buildings may offer a good metaphor to explain the approach introduced by the Justice 4.0 program. The access to information for citizens and lawyers, offered at the courts and tribunals, may now be performed by the Virtual Counter.[146] The filing of a lawsuit, previously carried out in the "protocol sector", can now be done in a totally virtual way, by the 100% Digital Judgement,[147] same with hearings that now can be held over the internet through different video conference platforms. Cases that were once stacked by the thousands in filing cabinets and filing sectors are now just "clicks away" in electronic process systems.

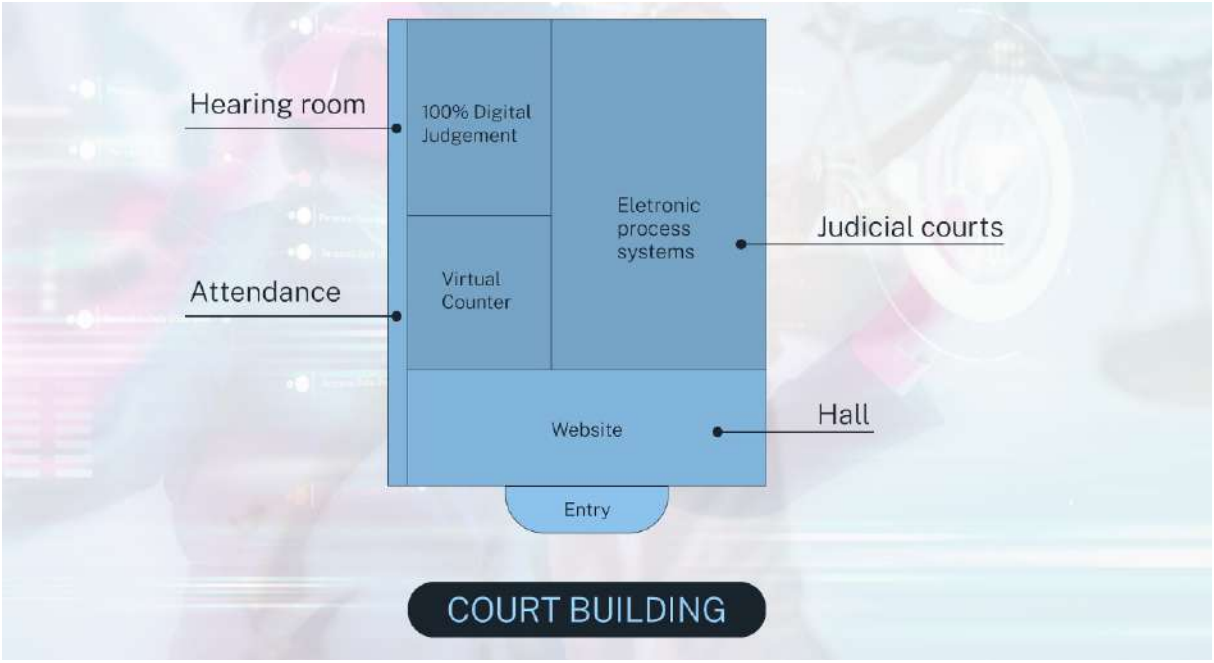
144 *CNJ*, 5 Eixos da Justiça (2020); https://www.cnj.jus.br/wp-content/uploads/2020/09/5-Eixos-da-Justiça-Ministro-Luiz-Fux-22.09.2020.pdf [01/08/2022].

145 The Justice 4.0 Program – Innovation and Effectiveness in Delivering Justice for All is developed in partnership between the CNJ, the United Nations Development Program (UNDP), and the Council of Federal Justice (CJF), with support from the Superior Electoral Court (TSE), the Superior Court of Justice (STJ), and the Superior Council of Labour Justice (CSJT); also see *CNJ*, Justiça 4.0; https://www.cnj.jus.br/tecnologia-da-informacao-e-comunicacao/justica-4-0/; [01/08/2022].

146 *CNJ*, Balcão Virtual, https://www.cnj.jus.br/tecnologia-da-informacao-e-comunicacao/justica-4-0/balcao-virtual/
[01/08/2022].

147 *CNJ*, Juízo 100% Digital; https://www.cnj.jus.br/tecnologia-da-informacao-e-comunicacao/justica-4-0/projeto-juizo-100-digital/
[01/08/2022].

This forges an interaction among different "buildings", local realities, and the institutions that manage the Justice System.



The idea is to implement the concept of the "Judiciary *as a service*"[148], having a digital platform at the centre, the "PDPJ-Br" ("*Plataforma Digital do Poder Judiciário*").[149] Thus, creating a common interface that will allow interoperability of systems and common use of specific services and microservices organised in modules similarly to applications in a mobile connected device.

Additionally, the goal is to have all processes being electronic, hence eliminating the need for paper records and paper proceedings. Two deadlines have been established:

a. March 2022: Brazilian courts should admit only electronic processes.
b. December 2025: all courts to have digitised all their legacy paper files and records.

The journey towards establishing this concept of "Justice as a service" as planned depends on understanding the different parts of the process, which will be analysed in more detail below. For now, it is important to understand that there are at least four different layers[150] in this overall approach:

148 This would be the implementation of the concepts of "government as a platform" and "government as a service" transposed to the judiciary.

149 This concept was made clear in the assessment of one year of the Presidency of CNJ by Chief Justice Luiz Fux: RELATÓRIO DE GESTÃO, Luiz Fux; https://www.cnj.jus.br/wp-content/uploads/2021/09/relatorio-1ano-fux-arte-v21092021-web.pdf [01/08/2022].

150 This layered concept has not been spelled out in official documents, yet it serves the purpose of

1) the **data layer** focused on consolidating a "data lake";

2) the **data management layer** that allows for data to be integrated in and extracted from the lake;

3) the **systems layer** that provides the management of the processes and services necessary for the functioning of the justice; and

4) the **interactive layer** that allows the systems of the judiciary to connect to other systems.

All these layers should function together in an intraoperative manner with the different courts and tribunals cooperating in what could be seen as "all for one and one for all" fashion, increasing efficiency, a more rational use of resources and better services for the population.

B. Austria

I. History

Austria has made experiences in digitalisation of justice for decades having developed electronic applications as of 1980 like the electronic land register.[151] The Court Case Management System was launched in 1986 (in terms of order for payment procedure), expanded in 1987 (civil proceedings) and comprised all other proceedings by 1996.[152] In 1990, the Electronic Legal Communication system for communication between courts and legal professionals as well as the electronic business register were introduced.[153] In 2000, the insolvency register went online, in 2005, the electronic document register.[154] In 2008, the European order for payment procedure was digitised, in 2010, a digital file system for public prosecutor's offices was set up.[155] Electronic communication for all citizens went live in 2013.[156] It can be said, without any doubt, that the Austrian judiciary was one of the pioneers in this field, a role which has not changed until today.[157] Today's showcase is a digital application, called *Justice 3.0/eiP*, used by courts as

facilitating the understanding of how the different parts of the system work together.

151 *Gottwald*, Einführung, Verfahrensautomation Justiz, Elektronischer Rechtsverkehr und Justiz 3.0 (2020) p.11; https://unternehmensrecht.univie.ac.at/fileadmin/user_upload/i_unternehmensrecht/Lehre/SS_2020/Kurse/Auer_Gottwald/Einfuehrung__VJ__ERV_und_Justiz_3.0.pdf [01.08.2022].

152 *Gottwald*, Einführung, Verfahrensautomation Justiz, Elektronischer Rechtsverkehr und Justiz 3.0 (2020) p.11, [01/08/2022].

153 *Gottwald*, Einführung, Verfahrensautomation Justiz, Elektronischer Rechtsverkehr und Justiz 3.0 (2020) p.11, [01/08/2022].

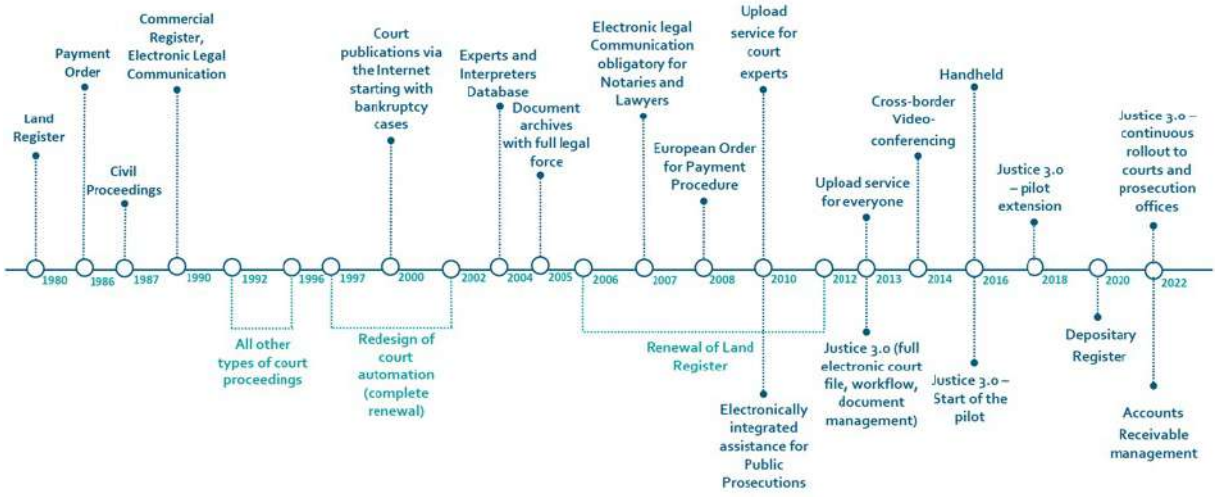
154 *Gottwald*, Einführung, Verfahrensautomation Justiz, Elektronischer Rechtsverkehr und Justiz 3.0 (2020) p.11, [01/08/2022].

155 *Gottwald*, Einführung, Verfahrensautomation Justiz, Elektronischer Rechtsverkehr und Justiz 3.0 (2020) p.11, [01/08/2022].

156 *Gottwald*, Einführung, Verfahrensautomation Justiz, Elektronischer Rechtsverkehr und Justiz 3.0 (2020) p.11, [01/08/2022].

157 *European Commission*, EU Justice Scoreboard 2021 p. 33; https://ec.europa.eu/info/sites/default/

well as by public prosecutor's offices for case and workflow management. While, by the end of 2016, the first pilot phase started at 4 regional courts in some kinds of civil proceedings, actually *Justice 3.0* is in use at about 80 courts and 20 public prosecutor's offices in several kinds of proceedings.[158]



C. Estonia

I. History

Estonia's history of e-justice only started after having gained independence in 1991. In 1994, the principles of the first Estonian Information Policy were drafted and adopted by the Parliament four years later.[159] In 1996, the Tiger Leap Initiative was established in order to update the IT infrastructure, to provide schools with computers, and to implement training in schools.[160] The X-Road, the national integration platform and backbone of e-Estonia, was introduced in 2001 to secure and harmonise the IT infrastructure.[161] Its source code is open to everybody.[162] One year later the e-ID was launched to accurately identify the citizens.[163] After a cyberattack in 2007, the country tried to focus on cybersecurity, and began to rely on blockchain technology from 2008 on by backing up registries.[164] For further data security, in 2015 a data embassy was formed in Luxembourg to backup all data outside the country to prevent complete system

files/eu_justice_scoreboard_2021.pdf [01/08/2022].

158 Presentation of the Federal Ministry of Justice of 17/03/2022.

159 *e-Estonia*, https://e-estonia.com/story/ [01/08/2022].

160 *e-Estonia*, https://e-estonia.com/story/ [01/08/2022].

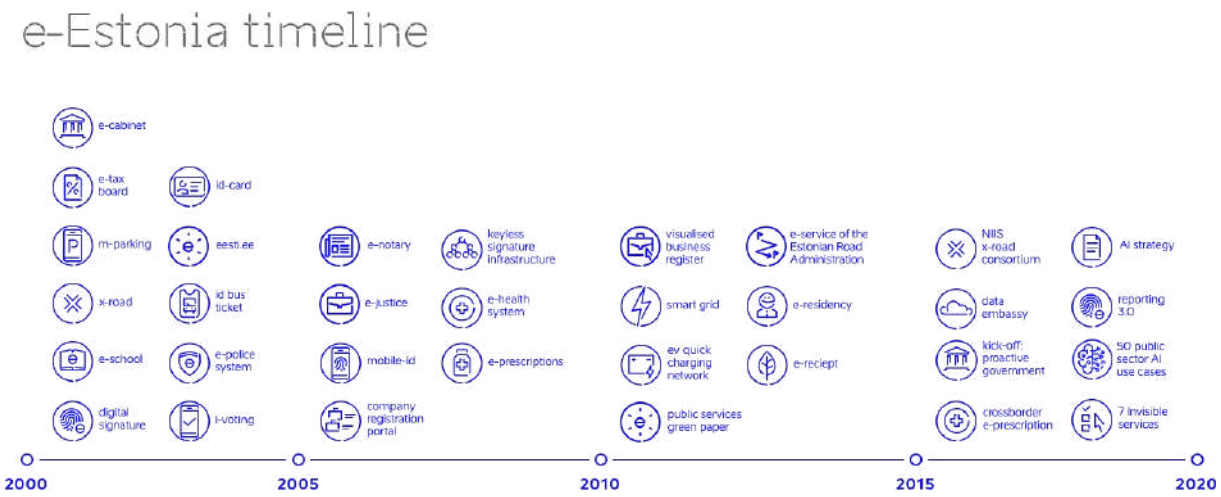
161 *e-Estonia*, https://e-estonia.com/story/ [01/08/2022].

162 *Raal*, Presentation at e-Estonia on 28/04/2022.

163 *e-Estonia*, https://e-estonia.com/story/ [01/08/2022].

164 *e-Estonia*, https://e-estonia.com/story/ [01/08/2022].

failures.[165] In 2019, a governmental AI strategy was set up for promoting the implementation of AI based solutions.[166]



II. RIK

The Centre of Registers and Information Systems is a state agency under the direction of the Ministry of Justice responsible for the operation and maintenance of Estonian judicial and administrative ICT services.[167] RIK administers different registers like e-File, the Court Information System (KIS), the Criminal Records Database or the State Gazette.

D. Germany

I. History

The federal structure, and the competence of the federal states for the administration of justice, also takes effect on e-Justice regulation. It is not surprising that the federal states have not implemented a unique system in terms of electronic case and workflow management.

In 1969, the Commission of Data Processing, one of the predecessors of the Commission of the Federation and the Federal States for Information Technology was established in order to develop a judicial information system, and later renamed as Commission of Data Processing and Rationalisation of Justice.[168] In 2012, when the e-Justice Council was founded, it became

165 *e-Estonia*, https://e-estonia.com/story/ [01/08/2022].

166 *e-Estonia*, https://e-estonia.com/story/ [01/08/2022].

167 *RIK*, The E-File project; https://unece.org/fileadmin/DAM/env/pp/workshops/SEE-EITWorkshop2010/Presentations/The_E-File_project_-_Estonia_Jensen.pdf [01/08/2022].

168 Justice Portal of the Federation and the Federal States, https://justiz.de/laender-bund-europa/BLK/index.php [01/08/2022].

the Commission of the Federation and the Federal States for Information Technology and continued in the role of a working group. [169] In the beginning, the Commission dealt with order for payment procedures, land register and fee systems, followed by registry automation systems and Electronic Legal Communication. Finally, it is the digitalisation of justice and projects like the digital file and remote proceedings via videoconference technology.[170]

3. Tools, Systems and Projects

A) Brazil

As noted above, the implementation of the concept of Justice as a service in Brazil is an ambitious undertaking that involves at least four different layers: 1) the data layer; 2) the data management layer; 3) the systems layer and 4) the interactive layer. The different tools, systems and projects will be seen under such banners.

I. The Data Layer

At the basis of the arrangement there is data. Until very recently data was mostly stored and accessed in silos, with limited interaction and interoperability among the different courts and tribunals. Each service and or system developed – by public or private institutions[171] – needed to extract data from the different databases, generating significant duplicity of work, not to mention traffic and costs. A common "data lake" intends to facilitate access and make better use of resources (avoiding double work).

01. Datajud

Datajud is the primary data platform of the Brazilian Judiciary[172]. This is where information about all physical and digital processes is indexed and based on this data, the main *statistics* of the national judiciary are produced. Through this platform information can be made available by means of a public API - extraction of the data is within the limits of the LGPD - the Brazilian

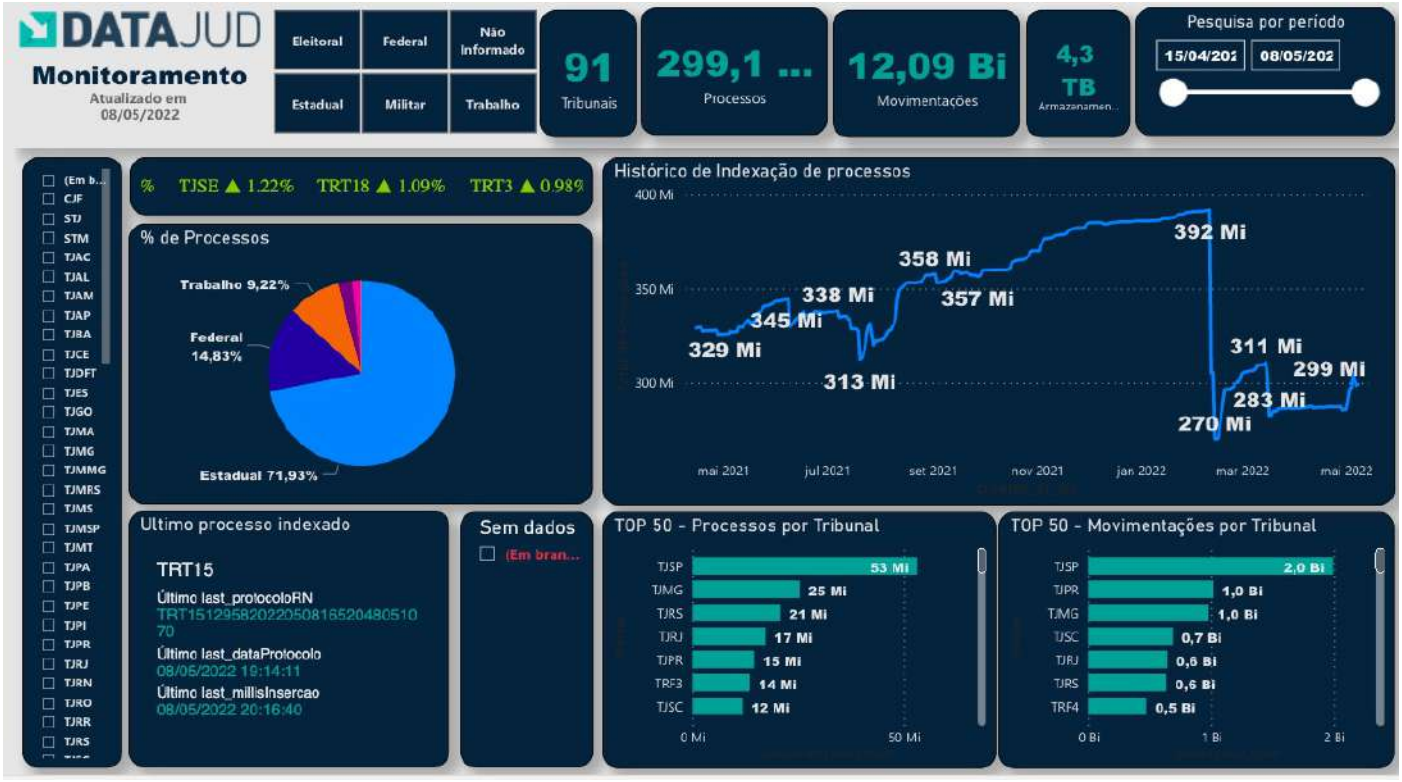
169 Justice Portal of the Federation and the Federal States, https://justiz.de/laender-bund-europa/BLK/index.php [01/08/2022].

170 Justice Portal of the Federation and the Federal States, https://justiz.de/laender-bund-europa/BLK/index.php [01/08/2022].

171 One should note that there is a significant ecosystem of "lawtechs" in the country that provide services that use the open data available from the different courts and tribunals in the country.

172 See also *CNJ*, DATAJUD; https://www.cnj.jus.br/sistemas/datajud/ [01/08/2022].

General Data Protection Legislation. In real time it is possible to know how many cases there are, how many cases were filed last year, which courts and branches of the judiciary have more or fewer cases, how long they have been running and what the congestion rate is, for example. This information is especially relevant for the development of public policies focused on judicial issues. Regarding the judiciary itself, this data is important for productivity and performance evaluations in general as well as in detail.



The injection of data in this platform today works using the automated mechanism, Codex, further analysed below.[173]

02. Codex

Codex[174] is a national platform developed by the Court of Justice of Rondônia in Partnership with CNJ. It is an initiative that integrates the Justice 4.0 Program and aims at solving a challenge that occurred after the digitalization of judicial processes: the automation and interpretation of judicial data. The electronic process still required a lot of repetitive work on the part of court workers in order for certain actions to be taken. Codex came up with the ability to convert

173 *CNJ*, Informativo de JURISPRUDÊNCIA DO CNJ; https://atos.cnj.jus.br/files/original2224212022031862350695d5cb4.pdf [01/08/2022].

174 *CNJ*, PLATAFORMA CODEX; https://www.cnj.jus.br/sistemas/plataforma-codex/ [01/08/2022].

large amounts of data and enable the transfer of information between different platforms. By functioning as a manager of the data lake it enables the extraction of data for various tasks ranging from the production of statistics and graphs to the elaboration of AI models. Codex feeds different systems and platforms as the Datajud and the Synapses (a platform for AI model management and training).

II. The Data Management Layer:

As a second layer, there is a need to have mechanisms that manage the in-take and out-take of the "data lake". Codex as noted above is a mechanism that functions as the gatekeeper extracting data from the various storage places and injecting it on the lake and working as the manager of the lake. It is not the only data manager system available. In connection with Codex, the platform Synapses has been developed in order to facilitate development and training of AI models with judicial data.

01. Synapses

The platform is further discussed below at study where there is a focus on AI solutions. Synapses are also the result of a partnership between the Court of Justice of Rondônia and the CNJ. The platform intends to provide a centralised management and training tool for AI models. It has access to the necessary data through the Codex platform and should be able to provide

ready to use data sets for AI models as well as allow cooperation in using and developing other AI models and AI driven tools.[175]

III. The Systems Layer

This is the layer mostly discussed because it is the basic infrastructure of the electronic judicial processes. There one finds both the electronic process systems and the solutions to provide access to the plethora of judicial acts that are published and made available to the public and the judicial services. The program Justice 4.0 aims at further developing and updating, particularly, this layer.

01. Electronic process systems:

It is estimated that there are around fifty different systems[176] in use in the country. This number should be reduced to about fourteen with the implementation of PDPJ-Br.[177] Among the main electronic process systems in use are:

a. Electronic Judicial Process - PJe: a system created in 2009 by CNJ technicians with the aim of unifying the electronic process of the different courts in the country. It is used in branches of the Federal, Electoral and Military Courts and in several state courts.

b. "Eproc": Electronic judicial process system developed by the Information Technology area of the Federal Regional Court of the 4th Region (Rio Grande do Sul, Santa Catarina, and Paraná) and originated in 2003. It is currently also used by state courts.

c. System of Automation of Justice – "SAJ/E-Saj": private system created in the 1990s and used until today in the largest court in the country, Court of Justice of São Paulo.

d. Digital Judicial Process - "Projudi": system created by the Court of Justice of Paraná in 2007. Currently, besides the TJ-PR itself, it is also used in other courts, such as the Court of Justice of Rio de Janeiro.

All these systems allow for processes to be 100% digital and for electronic proceedings to happen or be recorded in them. Under the terms of the current legislation, all citizens should be allowed to have access to information on all proceedings ("changes in statuses" also known as "procedural movements") unless otherwise decided and in circumstances that by law are supposed to be treated as confidential. Attorneys have wider access to the records being able to

175 *CNJ*, PLATAFORMA SINAPSES/Inteligência Artificial; https://www.cnj.jus.br/sistemas/plataforma-sinapses/[01/08/2022].

176 *CNJ*, Justice 4.0 programm; https://www.cnj.jus.br/wp-content/uploads/2022/05/justice-4-0-program.pdf [01/08/2022].

177 *CNJ*, Portal vai unificar acesso a serviços eletrônicos da Justiçahttps://www.cnj.jus.br/portal-vai-unificar-acesso-a-servicos-eletronicos-da-justica/ [01/08/2022].

access the content of processes themselves through such digital means, provided they register with the courts or use a digital certificate by means of a token. Some of the main difficulties encountered by users of the systems are eventual instability in services and significant layout changes from one platform to another. From the Judiciary's point of view, one challenge is balancing accessibility and data security. In 2021,[178] for example, an incident occurred on one of the largest courts in the country caused the suspension of procedural deadlines from April 28 to May 17 for electronic processes and until June 15 for physical ones.

02. Digital Platform of the Brazilian Judiciary (PDPJ-Br)

The PDPJ-Br is probably one of the most daring initiatives of the Justice 4.0 program. It should be implemented by 2022 and function as a multiservice platform, offering solutions that range from electronic process integration to software and artificial intelligence modules. On the platform, besides enabling the data dialogue of the different public electronic process systems, it will also be possible to share technology solutions among the courts. In other words, it will not be just an automation platform, or an application store, but rather a centre for sharing tools that will take the digitization of the Brazilian judiciary to a new stage.

Since its inception, the platform already has seven services available: the marketplace of microservices; a service for authentication and authorizations; a messaging and exchange of notifications service; unified data standardisation service ("*Tabelas Processuais Unificadas*"); electronic address service; exchange of basic lawsuit information ("*Cabeçalho do Processo*"); and organisational module. [179]

03. Electronic Justice Gazette - "DJE" ("Diário da Justiça Eletrônico")

178 Resolutions 3, 5 and 6/2021 - TJ-RS; https://www.tjrs.jus.br/novo/noticia/confira-as-normativas-publicadas-durante-o-periodo-de-instabilidade-dos-sistemas-de-informatica/ [01/08/2022].

179 *CNJ*, PDPJ docs; https://docs.pdpj.jus.br/ [01/08/2022].

As is the custom, legal proceedings in Brazil tend to gain publicity (as demanded by the Constitution) through their publication in "official gazettes". In the past, these publications were printed, usually in large circulation newspapers, now they have been updated to electronic format. Judicial procedural acts, especially notices, are published in "*Diários da Justiça Eletrônicos*" ("DJEs") - Electronic Justice Gazette - as well. All courts have their own journals, and the information is made available on the courts' websites. The goal is that as the implementation of the platform (PDPJ-Br) gains traction, the "gazettes" will have their publications integrated and centralised on the platform.

04. Electronic Information System - "SEI"

SEI is a system created by the Federal Regional Court of the 4th Region[180] and used by several other courts and public agencies, such as universities, states and municipal administrations, and public offices for example. This system is responsible for processing documents that organise the administrative and management processes of the institutions that use it.

05. 100% Digital Judgement Project

The 100% Digital Judgement project is not a software nor a specific tool or a system, but rather a strategy of using different software and systems that allows court proceedings to take place in a fully virtual manner. As seen earlier, electronic process systems have existed in the country for several decades. Law 11.419/2006, for instance, provided a national framework for "informatization" of legal proceedings, but it was with the Civil Procedure Code of 2015 that other acts, hearings, for instance, could be carried out by virtual means with support in procedural law.[181] However, as we know, the implementation of this procedural method has accelerated since the pandemic, one should note, for instance, CNJ Resolution 354/2020 that regulates the digital performance of judicial acts and processes.

At the moment of filing the lawsuit, the citizen can choose whether or not to use this modality. If he chooses so, all the procedural acts will occur in a virtual manner. This means, for instance, that the lawyer and the party must be notified by any virtual means, including messaging applications. The lack of more specific determinations about this allows for judicial debates about the validity of certain subpoenas,[182] hence may lead to further litigation. In this type of procedural process, the hearings occur, as a rule, through platforms such as Zoom or Teams. There is an increasingly strong debate about this type of hearing when it comes to testimonial evidence, after all, it is not possible to certify who is accompanying the deponent and what kind of information they may be passing on to the judge.

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180 TRF4 assina cessão de uso do SEI com seis instituições; https://www.trf4.jus.br/trf4/controlador.php?acao=noticia_visualizar&id_noticia=15524 [01/08/2022].

181 *CNJ*; http://www.planalto.gov.br/ccivil_03/_ato2015-2018/2015/lei/l13105.htm [01/08/2022].

182 KULESZA, Gustavo Santos; FERRÃO, Mariana Diniz de Argollo. 2021; https://www.migalhas.com.br/depeso/343610/intimacao-judicial-por-whatsapp [01/08/2022].

06. Virtual Counter project

The Brazilian Federal Constitution of 1988 states that the publicity of judicial acts stands as a guarantee of access to justice. Thus, access to proceedings is paramount. Historically, each court had a physical way to interact with the law clerks and court's officials, the "counter". During the pandemic, with the courts closed, it was necessary to adapt to a form of direct contact that involved a sufficient level of interaction but did not demand physical interaction. The solution was to provide "synchronous" services, preferably by video.

The Virtual Counter project implemented on a wider scale was one of the most efficient and creative solutions found. As in the 100% Digital Judgement project, the act that regulates it (CNJ Resolution N° 372/2021) does not propose one specific software, tool, or system. Currently virtually all Brazilian courts have a prominent tag or a button on their websites that redirects to a contacts page where it lists addresses, telephone numbers and, in most cases, a link to direct access to a virtual service. Citizens (and particularly lawyers, public defenders, and members of the prosecution services) can join a virtual service queue that will permit a direct interaction with a court's clerks or a public servant to that court.[183] The normative that created the virtual counter establishes the possibility of asynchronous services through messaging applications – such as WhatsApp – in cases where there are limitations, especially with respect to infrastructure and internet connection.

07. Justice 4.0 Centres

Justice 4.0 Centres are not to be confused with the 100% Digital Judgement project. After all, a case can be processed in a 100% digital way in any court, as long as the structure is in place. The Justice 4.0 Centres, unlike any other court, only handle 100% digital cases for specific predefined matters. In this case there is no particular building to which it is attached - nor necessarily any room. Usually, the geographic competences of each court tend to be restricted to a municipality or a portion of it, these centres allow their geographic competences to be much broader than that of a normal court. Although there are not many Centres implemented in the country yet, there are already some experiments, for example, with Justice 4.0 Centres that judge only tax matters in a large territorial area. This idea, however, runs the risk of suffering from its own virtues. If, on the one hand, a fully virtual court reduces costs and has the potential to reduce the length of proceedings, on the other hand it can be extremely overloaded by the concentration of judgments on the matter for which it is responsible[184].

08. Chatbots

183 One should be aware that there are some courts that do not fully have the infrastructure appropriate for the services, even if the number of the ones connected is in the high percentages.

184 See also *CNJ*, Núcleos de Justiça 4.0; https://www.cnj.jus.br/tecnologia-da-informacao-e-comunicacao/justica-4-0/nucleos-de-justica-4-0/ [01/08/2022].

Just as in the business world, Brazilian courts have invested in the implementation of virtual assistants, the chatbots. These robots, like the Court of Justice of Rondônia's Dakota[185], or the one made available by the Superior Electoral Court ("TSE"), perform several tasks. They can, for example, provide procedural information or explain to a citizen how to withdraw his or her electoral title by simply entering the Brazilian equivalent of the "social security number" ("CPF", "*cadastro de Pessoa física*").[186] These virtual assistants allow the citizenry to access information and request services in a format that is more akin to a dialog with a public official rather than an electronic system. There is a potential gain of access to justice and realisation of human rights.

IV. The Interactive Layer

This layer focuses on the interaction of the Judicial Systems with systems from other institutions - be them public or private. The logic is to automatize services and avoid the need for manual integration. One example is the execution of certain judicial orders. In many cases, such as in terms of access to social security benefits, there was the need of huge bureaucracies simply to manually implement in the social benefits system judicial orders. Integrating the systems automatize the processes, creates more efficiency, diminishes costs and gives more cohesion to the rule of law.

The goal is that the PDPJ-Br will facilitate the development of different modules and different services that may integrate with other systems. The logic is to provide a "marketplace" of different microservices that the different units of the Judiciary may have at their disposal.

01. Social Benefits Module - "Previdenciario"

As an integration of the PDPJ-Br, this service module allows automatic access to information in the "*Instituto Nacional do Seguro Social*" ("INSS") - the national social security institution - and implementation of certain judicial orders. This module provides better service in a much speedier fashion, eliminating the need of manual work of inputting the data from the order (already in the Judicial System) within the secondary system from the INSS[187].

02. Sniper

185 *TJRO*, Acesso efetivo à Justiça: TJRO lança chatbot para consultas processuais; https://www.tjro.jus.br/noticias/item/11759-acesso-efetivo-a-justica-tjro-lanca-chatbot-para-consultas-processuais [01/08/2022].

186 *TSE*, Chatbot: Tira-Dúvidas do TSE no WhatsApp traz novidades para as Eleições 2022, https://www.tse.jus.br/imprensa/noticias-tse/2022/Abril/chatbot-tira-duvidas-do-tse-no-whatsapp-traz-novidades-para-as-eleicoes-2022 [01/08/2022].

187 See also *CNJ*, 1 ano de Justiça 4.0; https://www.cnj.jus.br/wp-content/uploads/2022/01/1anodej4-0.pdf [01/08/2022].

Sniper is a system that cross-reference information in different databases (both available publicly or under restrictions) in order to provide insights in terms of the connections between individuals and assets and corporations. The tool is particularly useful for uncovering assets and transactions that otherwise would not be readily available, particularly for enforcement measures. It has been incorporated into the platform (PDPJ-BR) as one of its modules[188].

03. Unified Execution Electronic System - "SEEU"

The SEEU is an electronic system created and managed by the CNJ to manage penal executions in the country. Through the system it is possible to monitor the status of sentences imposed in the prison system, with features such as the automatic calculation of time already served. In addition, the system allows the generation of graphs and statistics, and is accessible from both a computer and a smartphone[189].

04. Judicial System for Searching Assets - "SISBAJUD""

SISBAJUD is a system widely used in the search for financial assets of people subject to a judicial order of freezing assets. It is by means of this tool that judges can order the search for assets, be them resources in banks, shares in companies etc. Functionalities are being added to the system and soon it will be possible to automatically repeat freezing of assets. Currently, only one attempt to freeze assets can be made for each court decision that authorises it. This system is available to magistrates throughout the country and should be integrated into the PDPJ.[190]

B. European Union

I. General

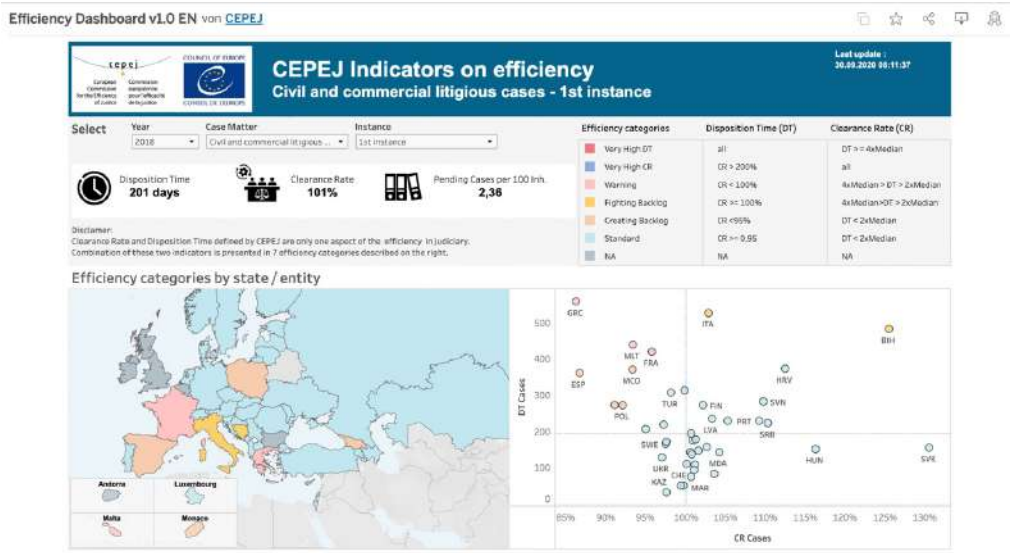
Due to its specific Union structure, and its plurality of judicial systems in the member states, it is clear, from the very beginning, that the level of judicial and, subsequently, of digital integration, stays behind a national state like Brazil. The Union system can only intervene or provide solutions for cross border affairs or disputes. Because of the existing different

188 See also *CNJ*, 1 ano de Justiça 4.0; https://www.cnj.jus.br/wp-content/uploads/2022/01/1anodej4-0.pdf [01/08/2022].

189 See also *CNJ*, Sistema Eletrônico de Execução Unificado (SEEU); https://www.cnj.jus.br/sistema-carcerario/sistema-eletronico-de-execucao-unificado-seeu/ [01/08/2022].

190 See also *CNJ*, Sisbajud, https://www.cnj.jus.br/sistemas/sisbajud/ [01/08/2022].

technical infrastructures in the member states, one of the main considerations is to implement harmonised data exchange solutions to ensure the communication between the systems. Another important aspect in terms of access to justice is the provision of platform-based solutions to provide information on the functioning of justice in other member states and create concentrated access points for procedure related actions (one- stop shop). In this context, the close cooperation between the European Union and the Council of Europe (CEPEJ – European Commission for the Efficiency of Justice) may be highlighted.[191]



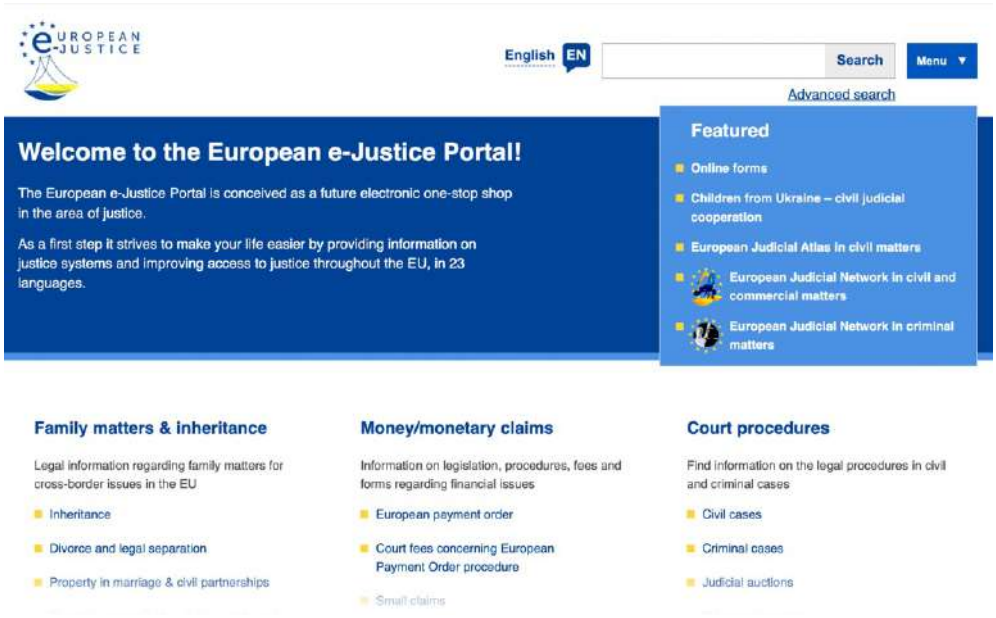
II. European e-Justice Portal

The online portal is "conceived as a future electronic one-stop shop in the area of justice".[192] At the moment, it provides judicial information in the 23 official languages, especially on citizens' rights and legal procedures. Furthermore, one can find online forms related to different actions and proceedings, links to national bodies and competent courts. It also serves as an access point to several EU and national registers concerning business, land, and insolvency. The European e-Justice Portal will also implement an e-Codex access point to file submissions directly on the platform, inter alia, as to the European payment order.[193]

191 Two studies prepared for the European Commission by CEPEJ (the European Commission for the Efficiency of Justice) on the functioning of judicial systems in the EU Member States – 2022; https://ec.europa.eu/info/publications/two-studies-prepared-european-commission-cepej-european-commission-efficiency-justice-functioning-judicial-systems-eu-member-states-2022_en [01/08/2022].

192 European e-Justice Portal; https://e-justice.europa.eu/home?action=home [01/08/2022].

193 *Leitner*, New developments on e-Justice, IRI§ conference 2022.



III. e-CODEX

e-CODEX (e-Justice Communication via Online Data Exchange) is the main tool for cross-border legal communication, open to citizens and professionals.[194] It is a decentralised communication tool, which has been developed by a consortium of EU member states over the last decade, and facilitates direct communication between the EU member states.[195] The last project under the umbrella of e-CODEX was the ME-CODEX II project focusing on the maintenance of e-CODEX.[196] The project under the leadership of the North-Rhine Westphalia ended by the end of last November.[197] The focus of this project was the further development, maintenance and the preparation of the hand-over to EU-LISA which should take place next year.[198] The ME-CODEX III project will entail the hand-over to EU-LISA and the respective knowledge transfer.[199] The basic technical infrastructure of e-CODEX consists of a gateway which connects the users and a connector that links national back-end applications to the generic messaging standards of the gateway.[200] The e-CODEX consortium also develops and supplies the users with use case-schemes to ensure interoperability.[201]

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194 E-CODEX, https://www.e-codex.eu/about [01/08/2022].

195 *Leitner,* New developments on e-Justice, IRI§ conference 2022.

196 *Leitner,* New developments on e-Justice, IRI§ conference 2022.

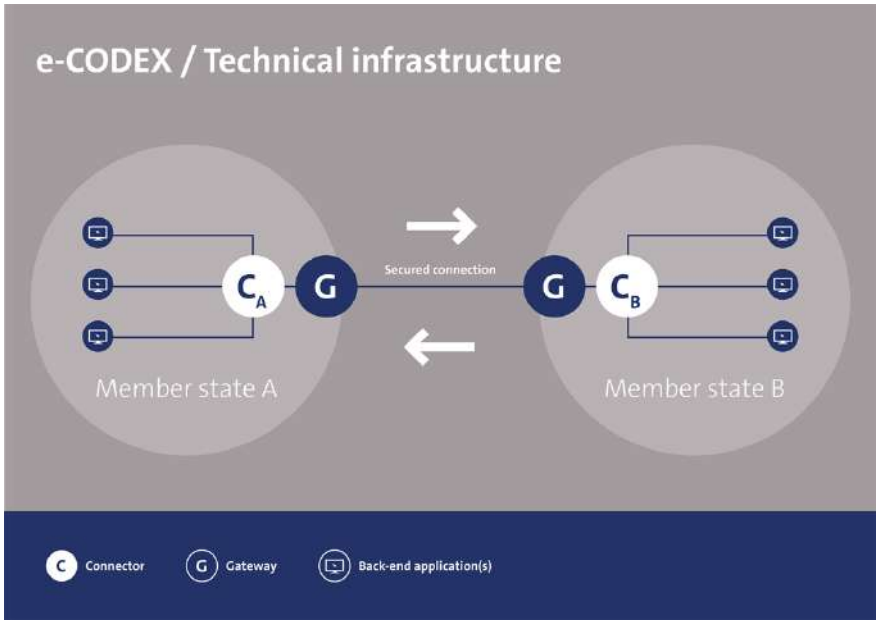
197 *Leitner,* New developments on e-Justice, IRI§ conference 2022.

198 *Leitner,* New developments on e-Justice, IRI§ conference 2022.

199 *Leitner*, New developments on e-Justice, IRI§ conference 2022.

200 e-CODEX building blocks; https://www.e-codex.eu/tech [01/08/2022].

201 e-CODEX building blocks; https://www.e-codex.eu/tech



One of them is the European order for payment procedure which is used to quite a large extent between different member states, especially Germany and Austria are pioneers in this area.[202] Two obligatory use cases of e-CODEX are related to the cooperation between the courts in the taking of evidence in civil or commercial matters and on the service of judicial and extrajudicial documents in civil or commercial matters (service of documents).[203]

IV. LEILA

Italy presides the project LEILA[204] which aims at implementing a multilingual European Platform for Judicial Auctions for EU-wide compulsory sale by auction of immovable property and companies. The data shall be automatically processed to this platform via the e-CODEX system[205] in real time, so the data will be constantly up to date.[206] The platform aims at "increasing the competitiveness and effectiveness of judicial auctions on EU level".[207]

[01/08/2022].

202 *Leitner*, New developments on e-Justice, IRI§ conference 2022.

203 *Leitner*, New developments on e-Justice, IRI§ conference 2022.

204 *The European Platform For Judicial Auctions*, https://eujudicialauctions.eu/ [01/08/2022].

205 *Leitner*, New developments on e-Justice, IRI§ conference 2022.

206 *The European Platform For Judicial Auctions*; https://eujudicialauctions.eu/news/eu-judicial-auctions-platform-benefitting-judicial-auctions-stakeholders [01/08/2022].

207 *The European Platform For Judicial Auctions*, https://eujudicialauctions.eu/a/about-leila [01/08/2022].

V. ISupport

ISupport is a use case for e-CODEX which not only comprises EU-member states but also Brazil and the United States.[208] It is an electronic case management system and secure communication system which facilitates the enforcement in matters relating to maintenance claims.[209] The Hague Conference on Private International Law is responsible for the project. The further development of the tool lies within the competence of several EU member states on a project basis.[210]

VI. Registers

Other activities on EU level concern the interconnection of registers and the provision of data from national databases accessible by means of a centralised search machine. LRI is the land register interconnection. In this area, the Union does not have competence, thus, its use is up to the voluntary cooperation of the EU member states.[211] LRI II was a project under the lead of Austria connecting the land registers of Austria, Estonia, and Latvia to the LRI system. LRI II also comprises payment and identification solutions for professional users.[212] IMOLA III wanted to unify the wording and terminology in the field of land registers. The outcome is a standardised European land register document.[213] BORIS, the register for beneficial ownership information, is still under development. The implementation was originally planned for 2021 but was postponed due to the need for further developments of authentication and payment solutions.[214] The European Court Database provides data of all civil courts in the EU and their respective competences. The application is based on open data and provides for an interface which allows for automatic processing.[215] The Criminal Court Database is under construction and is the equivalent in criminal matters. Right now, its focus lies on the data of authorities related to the European Investigation Order. The data is currently provided by ATLAS, an application of the European Judicial network, but again, an interface is in planning.[216] IRI concerns the interconnection of insolvency registers. Since its version 2.0 of September 2021, it is obligatory for the EU member states.[217] Pursuant to BRIS, which has been in use for several years, all EU member states are obliged to provide company register related data.[218]

208 *Leitner*, New developments on e-Justice, IRI§ conference 2022.

209 HCCH, iSupport – The electronic case management and communication system in support of the 2007 Child Support Convention and the 2009 Maintenance Regulation (2019), https://www.e-codex.eu/sites/default/files/2019-08/190623%20iSupport%20illuminated_0.pdf [01/08/2022].

210 *Leitner*, New developments on e-Justice, IRI§ conference 2022.

211 *Leitner*, New developments on e-Justice, IRI§ conference 2022.

212 *Leitner*, New developments on e-Justice, IRI§ conference 2022.

213 *Leitner*, New developments on e-Justice, IRI§ conference 2022.

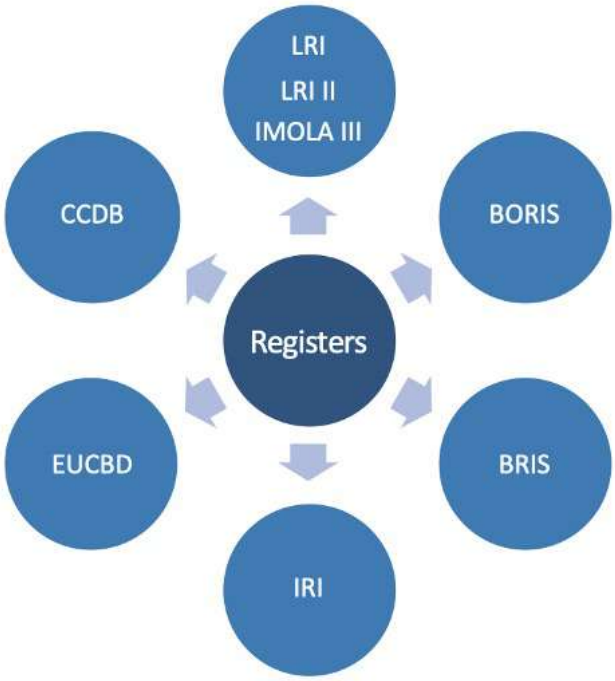
214 *Leitner*, New developments on e-Justice, IRI§ conference 2022.

215 *Leitner*, New developments on e-Justice, IRI§ conference 2022.

216 *Leitner*, New developments on e-Justice, IRI§ conference 2022.

217 *Leitner*, New developments on e-Justice, IRI§ conference 2022.

218 *Leitner*, New developments on e-Justice, IRI§ conference 2022.



VII. SimpliVI

The SimplVI project wants to overcome the organisational obstacles relating to secure cross-border videoconferences by publishing a handbook and a respective e-CODEX use case.[219]

C) Austria

I. Electronic Legal Communication (ELC)[220]

ELC[221] is an electronic legal communication system, which was introduced in 1990 for digital communication purposes between courts and the parties' representatives. While in the beginning it was presented as a one-way electronic transmission tool for parties' submissions,

219 *Leitner*, New developments on e-Justice, IRI§ conference 2022.

220 Original title: "Elektronischer Rechtsverkehr - ERV"

221 See Articles 89a to 89q of the Court Organisation Act, https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=10000009 [01/08/2022].
and Federal Ministry of Justice Regulation on Electronic Legal Communication; original title: „Verordnung der Bundesministerin für Justiz über den elektronischen Rechtsverkehr [ERV 2006]"; https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=20004493&FassungVom=2006-12-31 [01/08/2022].

since 1999, it has also enabled the service of court decisions. ELC also provides for electronic data processing and importing into different applications used by the judiciary.[222] Interface descriptions are available in the Database of Official Publications.[223] By implementing electronic signature in 2006 to promote ELC, advocates, notaries and civil engineers have been entitled to generate and transfer official documents electronically with the legal effects of a personal signature. The same has applied to court decisions and, generally, to the judiciary, who take advantage of electronic signature in many other fields, inter alia, for public certification and excerpts of the business and land register.[224] In 2007, ELC was migrated to web service technology using Message Transmission Optimisation Mechanism (MTOM).[225] SSL and different certificates are used for encryption.[226] There are several providers offering access to ELC for professional users outside the judiciary. Data transfer is restricted to 50 MB per submission.[227] ELC allows submissions to be sent via XML data and attachments in pdf/A format. Since early 2009, courts and public prosecutors' offices[228] have served judgments, transcripts, and other documents as pdf/A attachments. Furthermore, different authorities use ELC for e-communication. Basically, the use of ELC is open to everybody with a bank account in Austria for automated court fee collection.[229] Currently ELC has more than 10,000 subscribers with a total volume of approximately 14 million messages per year. The following bodies are subjected to the use of ELC:[230] Advocates and defending lawyers (since 2007), notaries (since 2007), banks and financial institutions (since 2012), insurance companies (since 2012), social insurance carriers and the Confederation of social insurance carriers (since 2014), pension institutes (since 2014), the Federal Attorney's Office (since 2014) and Bar associations (since 2014). The

222 *Federal Ministry of Constitution, Reforms, Deregulation and Justice and Federal Ministry of Digital and Economic Affairs*, IT-Anwendungen in der österreichischen Justiz (2020) p. 9, https://www.justiz.gv.at/home/service/justiz-und-it~955.de.html [01/08/2022].

223 *Database of Official Publications;* https://edikte.justiz.gv.at/edikte/km/kmhlp05.nsf/all/erv [01/08/2022].

224 *Federal Ministry of Constitution, Reforms, Deregulation and Justice and Federal Ministry of Digital and Economic Affairs*, IT-Anwendungen in der österreichischen Justiz (2020) p. 22.

225 Since then it is also called WebELC.

226 *BMVRDJ*, From Punchcards to Legal Tech: 40 years of E-Justice in Austria (2018), p. 119.

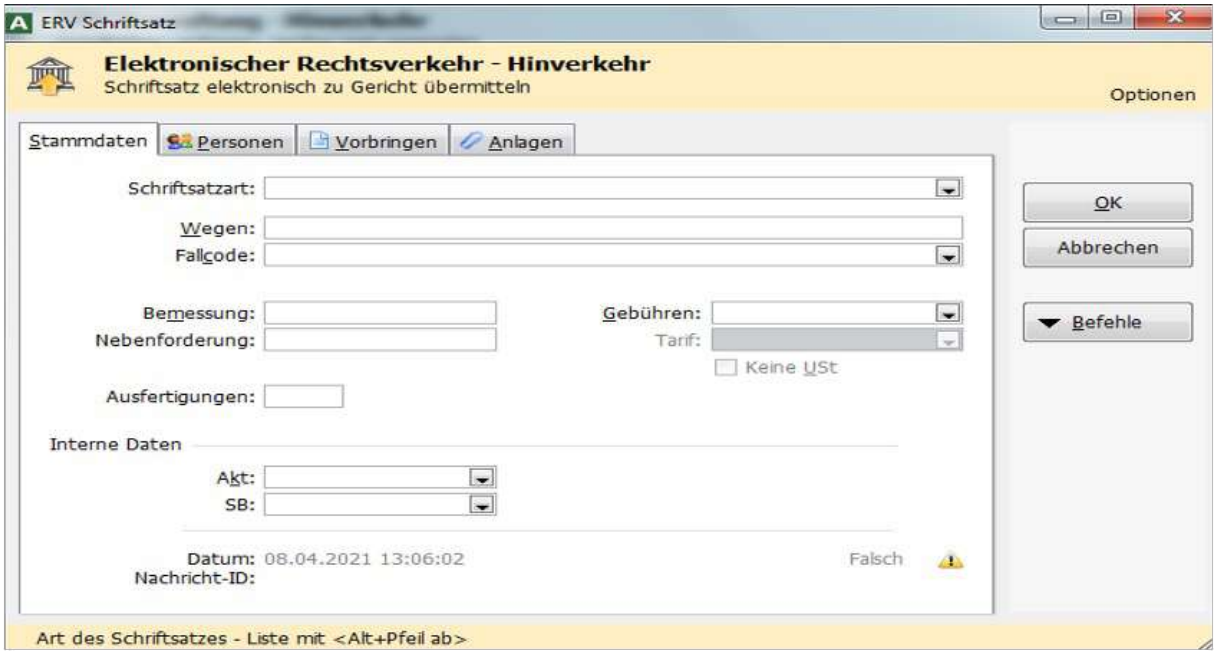
227 *Gottwald*, Einführung, Verfahrensautomation Justiz, Elektronischer Rechtsverkehr und Justiz 3.0 (2020) p. 85; https://unternehmensrecht.univie.ac.at/fileadmin/user_upload/i_unternehmensrecht/Lehre/SS_2020/Kurse/Auer_Gottwald/Einfuehrung__VJ__ERV_und_Justiz_3.0.pdf [01/08/2022].

228 See Article 34a of the Act on Public Prosecutor's Offices; original title: "Bundesgesetz vom 5. März 1986 über die staatsanwaltschaftlichen Behörden"; https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=10000842 [01/08/2022].

229 *BMVRDJ*, From Punchcards to Legal Tech: 40 years of E-Justice in Austria (2018), p. 11

230 See Article 89c § 5 and § 5a of the Court Organisation Act.

Constitutional Court (since 2013),[231] the Supreme Administrative Court (since 2014)[232] and the Federal Administrative Court (since 2014)[233] have also been connected to ELC. Since 2016, all users have been able to communicate with each other via ELC.[234] The subscribers of ELC have to make use of Transmitting Agencies, which are responsible for the adequate software and the transmission of the data to FCC.[235] Courts and authorities can communicate with each other directly via FCC.[236]



231 *See the Regulation of the President of the Costitutional Court on Electronic Submission; https://www.ris.bka.gv.at/Dokumente/BgblAuth/BGBLA_2013_II_82/BGBLA_2013_II_82.pdfsig [01/08/2022].*].

232 See Regulation of the Federal Chancellor on Electronic Legal Communication between the Federal Administrative Court and parties , https://www.ris.bka.gv.at/Dokumente/BgblAuth/BGBLA_2013_II_515/BGBLA_2013_II_515.pdfsig [01/08/2022].

233 *Federal Ministry of Constitution, Reforms, Deregulation and Justice and Federal Ministry of Digital and Economic Affairs*, IT-Anwendungen in der österreichischen Justiz (2020) p 9.

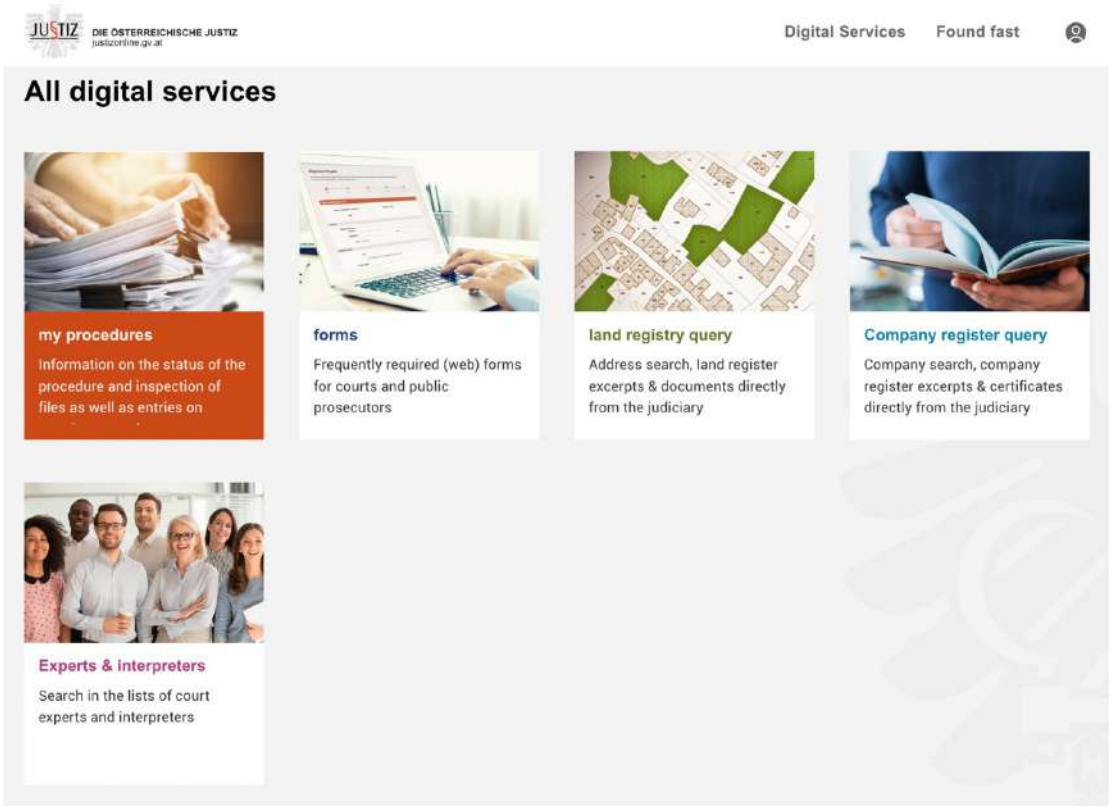
234 See Article 89b § 2 of the Court Organisation Act in conjunction with Article 3 of the Federal Ministry of Justice Regulation on Electronic Legal Communication, https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=20004493 [01/08/2022].

235 *See Article 89d of the Court Organisation Act.*

236 Article 9 of the Federal Ministry of Justice Regulation on Electronic Legal Communication.

II. JusticeOnline

JusticeOnline is a service offered by the judiciary for citizens and unites several services, from submission to electronic court records access, form-based requests and electronic service of documents and decisions. It was launched on 25 November 2020 by FCC who are also responsible for its operation. JusticeOnline wants to ensure easy access to the judiciary via PC or mobile phone, for private users and companies.[237] Furthermore, it provides access to the land and company register. Apart from the above-mentioned functions, it integrates a chatbot solution, known as Justitia, which not only answers all kinds of legal questions but also guides the user through different kinds of proceedings.[238] Additionally, one can find a glossary of judiciary-related terms. For technical and functional support, a telephone hotline is implemented at FCC on weekdays from 8 a.m. to 4 p.m.[239] For legal support, it is the competent court or public prosecutor's office to be addressed.[240]



237 *Federal Ministry of Justice*, https://www.bmj.gv.at/ministerium/aktuelle-meldungen/JustizOnline-gewinnt-e-Award.html [01/08/2022].

238 *Federal Ministry of Justice*, https://justizonline.gv.at/jop/web/home [01/08/2022].

239 *Federal Ministry of Justice*, https://justizonline.gv.at/jop/web/home [01/08/2022].

240 *Federal Ministry of Justice*, https://justizonline.gv.at/jop/web/home [01/08/2022].

For reasons of identification Austrian citizens have to use a mobile phone signature or a smart card, foreign nationals access by applications meeting the eIDAS criteria. In 2022, the follow-up system e-ID was piloted, which not only allows for electronic signature but also implies a legal identity. Since 2019, expert witnesses and interpreters have been obliged to electronically transfer expert opinions and translations respectively via JusticeOnline.[241]

III. Electronic service of official documents (e-service)

Everyone has the right to electronic communication with courts and administrative bodies in matters of federal legislation excluded matters, which are not suitable to be provided electronically.[242] For this reason, every person can activate a free electronic mailbox to receive official notifications digitally. Verification via mobile phone signature is required.[243] Basically, companies are obliged to participate in e-Service via the Company Service Portal (www.usp.gv.at).[244] Authorities may also use the Company Service Portal to receive notifications.[245] Electronic Service Providers make sure that documents arrive at the recipient's sphere via Dual Service, which means that the notification is served electronically and, subsidiarily, physically, when the recipient does not participate in electronic service.[246] The authority may alternatively utilise an electronic service application of its own.[247] The participants of eService may be requested in the subscriber directory.[248] It is also possible to automatically forward served documents to the Electronic Legal Communication tool ELC.[249]

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241 *Federal Ministry of Constitution, Reforms, Deregulation and Justice and Federal Ministry of Digital and Economic Affairs*, IT-Anwendungen in der österreichischen Justiz (2020) p. 6 [01/08/2022].

242 *Article 1a of the Federal E-Government Act.*

243 https://www.oesterreich.gv.at/themen/dokumente_und_recht/Elektronische-Zustellung0/Ablauf-der-Zustellung-%C3%BCber--MeinPostkorb-.html *[01/08/2022]*.

244 *Article 1b of the Federal E-Government Act; also see* https://www.usp.gv.at/laufender-betrieb/elektronische-zustellung.html *[01/08/2022]*.

245 *Federal Ministry of Finance,* WHITEPAPER e-service for authorities, p.22; https://www.bmf.gv.at/dam/jcr:d453503a-3f87-4cc2-b7d0-582a749e707e/2022%2007%2012%20WHITEPAPER_eZustellung_f%C3%BCr_Beh%C3%B6rden_v2.2.pdf *[01/08/2022]*.

246 *Federal Ministry of Finance,* WHITEPAPER e-service for authorities, p.22; https://www.bmf.gv.at/dam/jcr:d453503a-3f87-4cc2-b7d0-582a749e707e/2022%2007%2012%20WHITEPAPER_eZustellung_f%C3%BCr_Beh%C3%B6rden_v2.2.pdf *[01/08/2022]*.

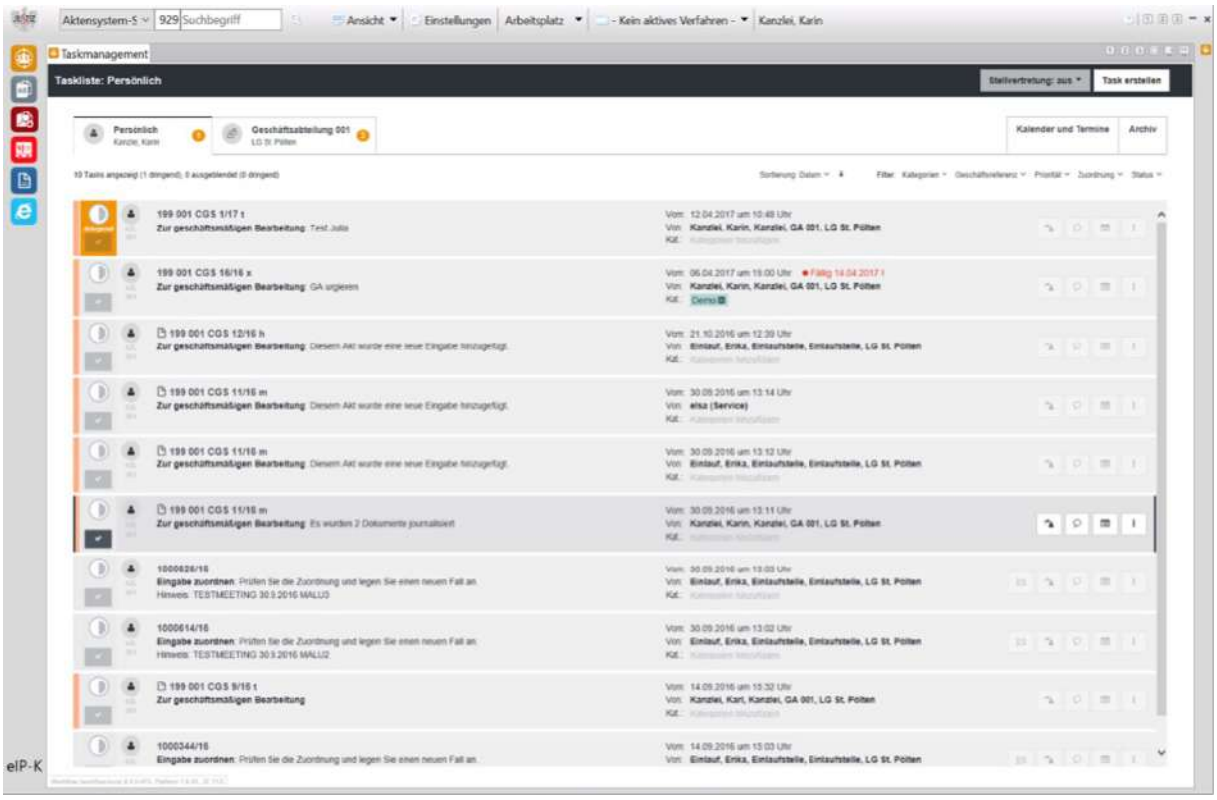
247 *Article § 30a of the Federal Act on the Service of Official Documents, original title: "Bundesgesetz über die Zustellung behördlicher Dokumente";* https://www.ris.bka.gv.at/Dokumente/Erv/ERV_1982_200/ERV_1982_200.pdf *[01/08/2022]*.

248 *Article § 28a of the Federal Act on the Service of Official Documents.*

249 *Federal Ministry of Finance, WHITEPAPER e-service for authorities, p.21;* https://www.bmf.gv.at/dam/jcr:d453503a-3f87-4cc2-b7d0-582a749e707e/2022%2007%2012%20WHITEPAPER_eZustellung_f%C3%BCr_Beh%C3%B6rden_v2.2.pdf *[01/08/2022]*.

IV. Justice 3.0/eIP

Justice 3.0 is a strategic initiative, established in 2013, which aims to provide the best possible IT support for all user groups and fully electronic handling of procedures.[250] By the end of 2016, a pilot project on completely digital file management had been started at four regional courts. In 2017, progress was made in terms of stability, performance, and functional assistance. In 2018, the Commercial Court Vienna was included as another pilot site.[251] Justice 3.0 integrates all existing IT modules such as the old Court Case Management System (CCMS) as well as ELC and complements them with the Electronic Integration Portal (eIP), the core of the project.[252] eIP is a digital document management and workflow system[253] which deals with all tasks related to court proceedings and supports fully digital file management. It can be accessed from everywhere and by several users at the same time.[254] The entire digital content of a file can be browsed via full text search. eIP was acquired from the Bavarian State Ministry of Justice and



250 *Federal Ministry of Constitution, Reforms, Deregulation and Justice and Federal Ministry of Digital and Economic Affairs,* IT-Anwendungen in der österreichischen Justiz (2020) p. 38;

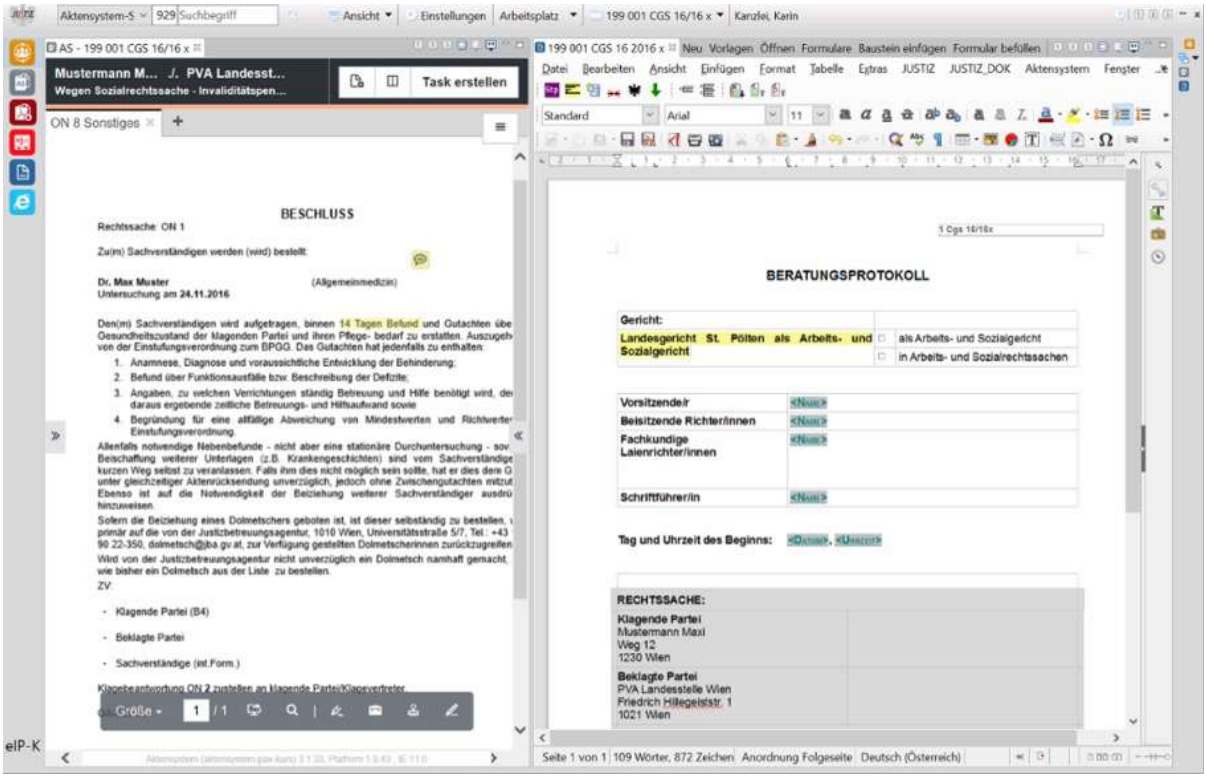
251 *Federal Ministry of Constitution, Reforms, Deregulation and Justice and Federal Ministry of Digital and Economic Affairs*, IT-Anwendungen in der österreichischen Justiz (2020) p. 38.

252 *Federal Ministry of Justice,* Justiz 3.0; https://www.bmj.gv.at/themen/justiz-3.0.html [01/08/2022].

253 *Klausegger/Tretthan-Wolski*, Digitalisierung der österreichischen (Zivil-)Gerichte, 199 (202).

254 Gesek, Justiz 3.0: auf dem Weg zum digitalen Verhandlungssaal; https://future-law.at/ltk17/justiz-3-0-auf-dem-weg-zum-digitalen-verhandlungssaal [01/08/2022].

customised for the needs of the Austrian judiciary. One of the first in-house developments was the task management system, a digital mailbox which lists all tasks assigned to each user.[255] By clicking on the task, the digital file opens for editing. The integrated text processing tool based on LibreOffice in conjunction with automatically filled templates abbreviates the process of drafting decisions and lets the judges concentrate on the legal work.[256] eIP keeps integrating CCMS for register management, which cannot be immediately replaced in respect of the great variety of proceedings.[257] For the purposes of digital access to files, the entire content of the file can be converted to pdf/A format including a structured table of contents and provided to party representatives, authorities or experts at any time without delay. In the meantime, the file can be reviewed by the judge or the registry respectively.[258] There is no longer the need for transporting the files between different departments. The eIP is connected to ELC and all incoming documents are automatically processed. Incoming paper files are scanned and digitised by OCR text recognition.[259]



255 *Gesek,* Justiz 3.0: auf dem Weg zum digitalen Verhandlungssaal.

256 *Gesek,* Justiz 3.0: auf dem Weg zum digitalen Verhandlungssaal.

257 *Gesek,* Justiz 3.0: auf dem Weg zum digitalen Verhandlungssaal.

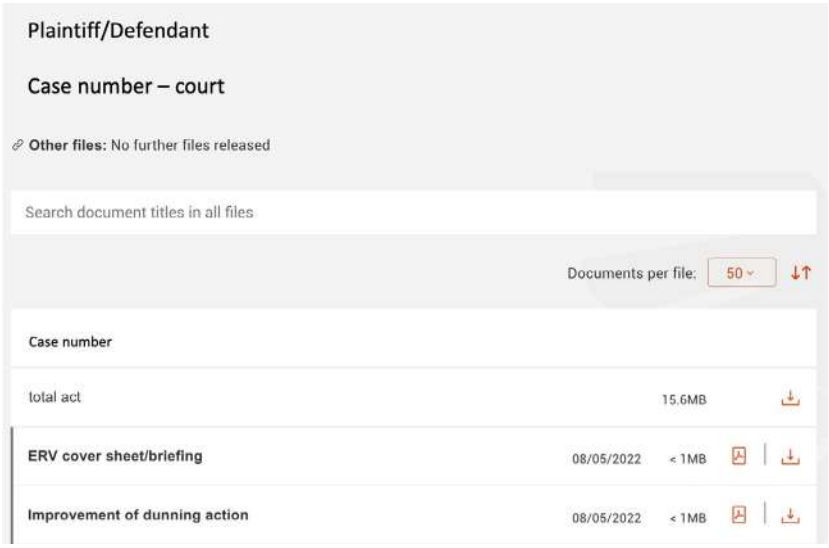
258 *Federal Ministry of Justice*, Justiz 3.0; https://www.bmj.gv.at/themen/justiz-3.0.html [01/08/2022].

259 *Federal Ministry of Justice*, Justiz 3.0; https://www.bmj.gv.at/themen/justiz-3.0.html [01/08/2022].

There are, basically, three different user groups linked to the electronic infrastructure of the Austrian judiciary: (1) users within judiciary, like judges and public prosecutors and the non-judicial staff who work directly within justice applications; (2) professional users like advocates or court experts and interpreters who are connected to the judiciary via ELC and, (3) unrepresented parties of proceedings, who communicate via the web-based tool JusticeOnline with the judicial authorities competent.

V. Electronic record access

The (remote) electronic record access[260] is part of the Justice 3.0 strategy to support citizen-orientated, efficient and rapid proceedings and to enhance digital file management.[261] It helps to reduce the workload of court staff and to clearly identify the applicant.[262] Authorised users are entitled to access the procedural data stored in CCMS, currently restricted to civil, enforcement and probate proceedings and primarily utilised by experts, notaries and court commissioners.[263] Since 2020, all citizens have been enabled to access the records in civil proceedings concerning themselves via mobile phone signature/e-ID or smart card for free.[264] The records may also be downloaded as structured and searchable pdf/A including a table of contents of the entire case file. The access can be restricted to certain documents and to certain periods of time.[265]



260 Article 89i of the Court Organisation Act.

261 *Federal Ministry of Constitution, Reforms, Deregulation and Justice and Federal Ministry of Digital and Economic Affairs*, IT-Anwendungen in der österreichischen Justiz (2020) p. 39.

262 *BMVRDJ*, From Punchcards to Legal Tech: 40 years of E-Justice in Austria 2018), p. 98.

263 *Federal Ministry of Justice*, List of court experts and interpreters, https://sv.justiz.gv.at/edikte/welcomereg.nsf/sdl/akteneinsicht [01/08/2022].

264 *Federal Ministry of Constitution, Reforms, Deregulation and Justice and Federal Ministry of Digital and Economic Affairs*, IT-Anwendungen in der österreichischen Justiz (2020), p. 39.

265 *Federal Ministry of Constitution, Reforms, Deregulation and Justice and Federal Ministry of Digital and Economic Affairs*, IT-Anwendungen in der österreichischen Justiz (2020) p. 39.

VI. E-Courts

eIP is also used for hearings in e-courts. About 350 e-courts are equipped with video-conference technology,[266] which allows not only testimony but to hold fully remote hearings.[267] Other court rooms may be supplied with mobile video-conferencing equipment on request.[268]

D. Estonia

I. E-file (e-toimik)

The e-File project started in 2005 for reasons of unification of a fragmented system which had not guaranteed access to procedural information for all parties, in particular, the citizens.[269] In 2009, e-File was launched in terms of criminal proceedings, while civil and administrative cases

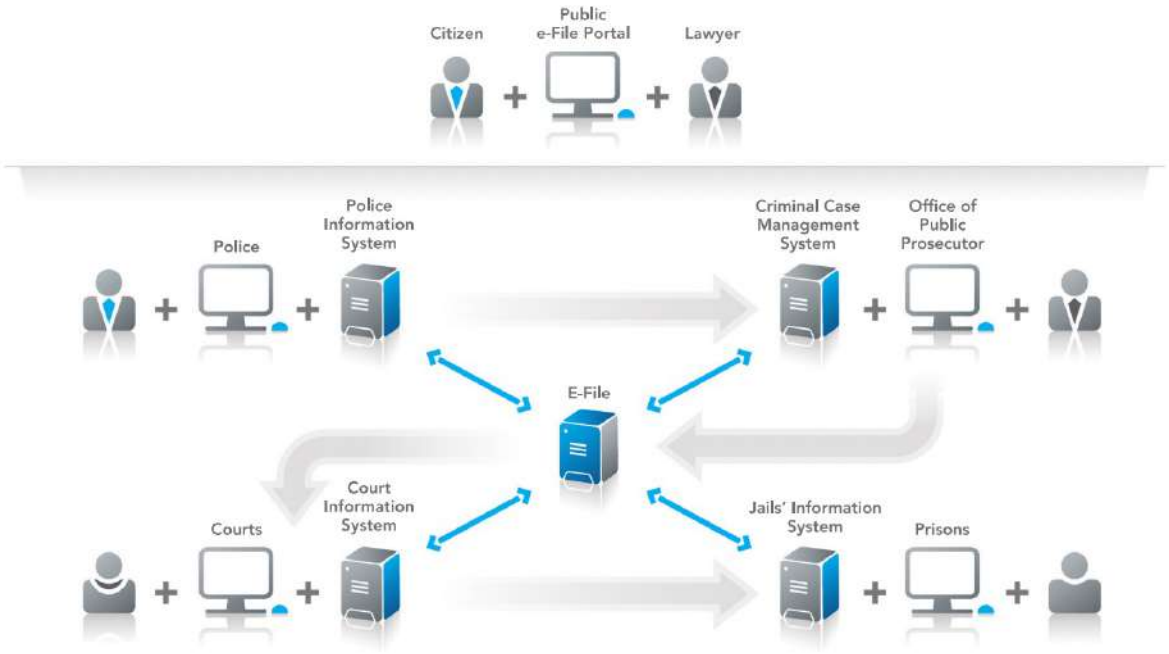
266 *Haubner*, Justice 3.0 and Justice Online, Speech at IRIS conference (25 February 2022).

267 Until 31/12/2022 it is temporarily based on Article 3 of the Federal Act on accompanying measures concerning Covid-19 , original title: "Bundesgesetz betreffend Begleitmaßnahmen zu COVID-19 in der Justiz", https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=20011087 [01/08/2022].

268 *Schneider*, Interview at the Federal Ministry of Justice (06/10/2021).

269 *Raal, Presentation at e-Estonia on 28/04/2022.*

were incorporated in 2014.[270] In 2020, the transformation was completed with the inclusion of all proceedings.[271] e-File contains all procedural data like status, acts and court orders, accessible not only by courts but also connected to the Criminal Case Management System of the Public Prosecutor's Offices, the Police Information System and the Jail Information System. Citizens and Lawyers participate via the public branch of e-File.



II. Public e-File

Public e-File allows citizens and lawyers to launch and observe proceedings of any kind, be it civil, criminal, misdemeanour or administrative. Almost 9000 users access the web-based platform every day.[272] It requires verification by means of mobile signature or ID card.[273]

270 *Raal, Presentation at e-Estonia on 28/04/2022.*

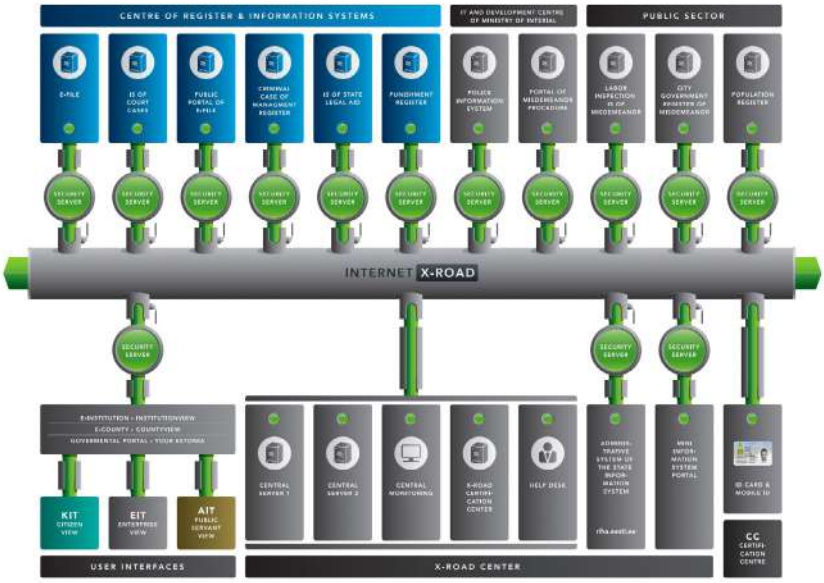
271 *Raal, Presentation at e-Estonia on 28/04/2022.*

272 *RIK,* Public e-file, https://www.rik.ee/sites/www.rik.ee/files/elfinder/article_files/RIK%20Public%20eFile.pdf [01/08/2022].

273 *RIK,* Public e-file, https://www.rik.ee/sites/www.rik.ee/files/elfinder/article_files/RIK%20Public%20eFile.pdf [01/08/2022].

III. X-road (x-tee)

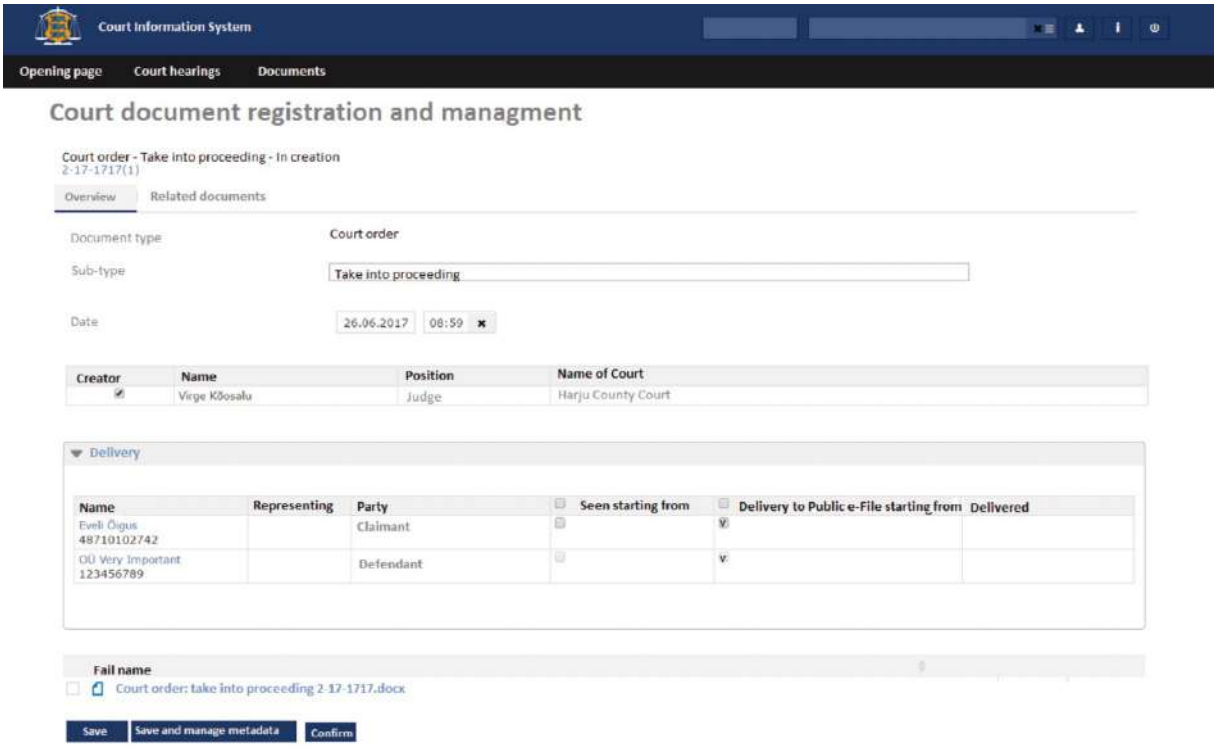
By the end of the 1990s and early 2000, Estonia had established different electronic registries.[274] Instead of implementing a central datacentre, Estonia decided on the X-Road, a secure data exchange platform which interlinks different registers.[275] Its source code is open to the public.[276] The ministries or authorities remain responsible for the data in their respective registries.[277] The data is provided via X-Road very easily and exchanged securely via end-to-end encryption by means of the internet.[278] The X-Road is based on the once-only-principle, which means the data is only stored in one registry.[279] The data is provided for free, but the access is restricted and requires a permission by, for example, the person which is concerned by the data.[280] Aside from applications of the judiciary, also the Government, the Public Sector as well as the Ministry of the Interior are communicating by means of X-Road run by X-Road centre. The X-Road is complying with the European Framework of Interoperability and the EiDAS criteria.[281] 602 institutions and enterprises take part in X-Road, 1364 information systems are connected, 2905 services are provided, 1.5 billion inquiries were registered in 2020.[282]



274 *Raal*, Presentation at e-Estonia on 28/04/2022.
275 *Raal*, Presentation at e-Estonia on 28/04/2022.
276 *Raal*, Presentation at e-Estonia on 28/04/2022.
277 *Raal*, Presentation at e-Estonia on 28/04/2022.
278 *Raal*, Presentation at e-Estonia on 28/04/2022.
279 *Raal*, Presentation at e-Estonia on 28/04/2022.
280 *Raal*, Presentation at e-Estonia on 28/04/2022.
281 *e-Estonia*, Factsheet X-Road, https://e-estonia.com/wp-content/uploads/2020mar-facts-a4-v02-x-road.pdf [01/08/2022].
282 *RIK*, Presentation in Tallinn on 29/04/2022.

IV. Court Information System

KIS is the case management system of the Estonian judiciary and comprises all instances and proceedings, from registration of the case to publication of the decision. Case allocation, summons, hearings are also processed by KIS.[283] Submissions via public e-File are automatically transferred to KIS.[284]

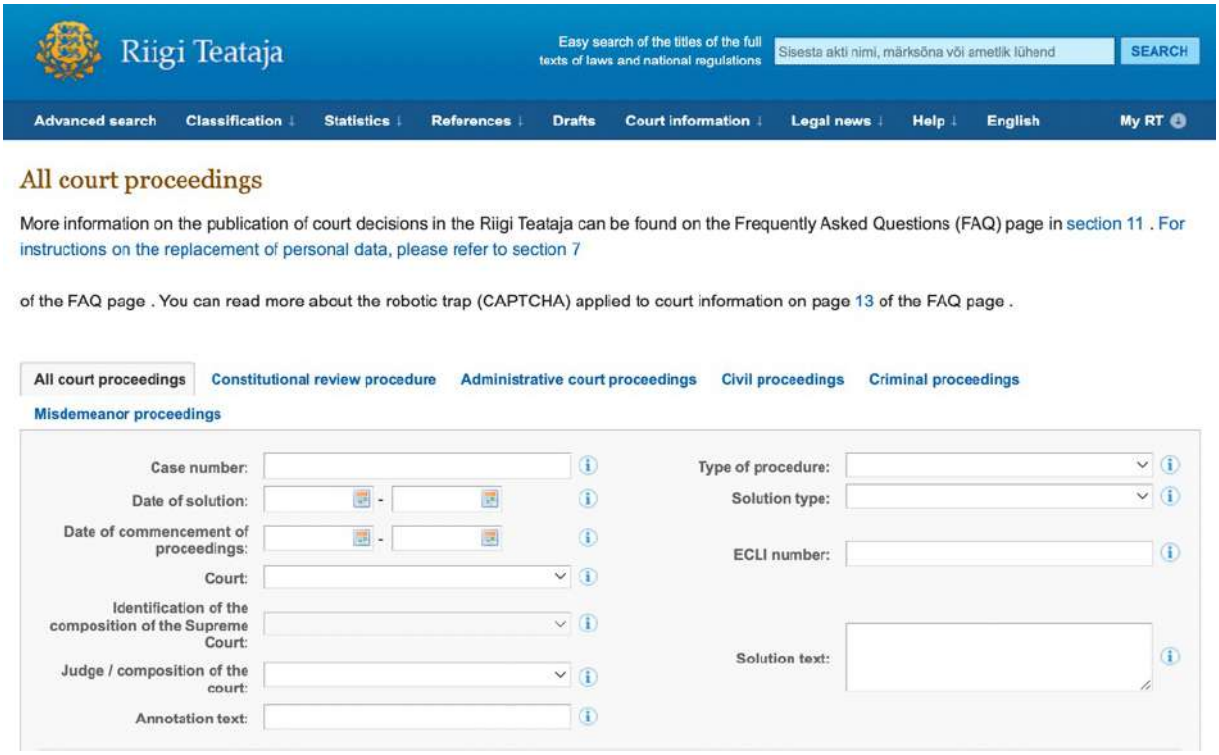


283 *RIK*, Court Information System, https://www.rik.ee/en/international/court-information-system [01/08/2022].

284 *RIK*, Court Information System, https://www.rik.ee/en/international/court-information-system [01/08/2022].

V. Electronic State Gazette

The Electronic State Gazette provides, inter alia, information on all legislative acts and court decisions.[285]



E. Germany (North Rhine Westphalia)

I. General remarks

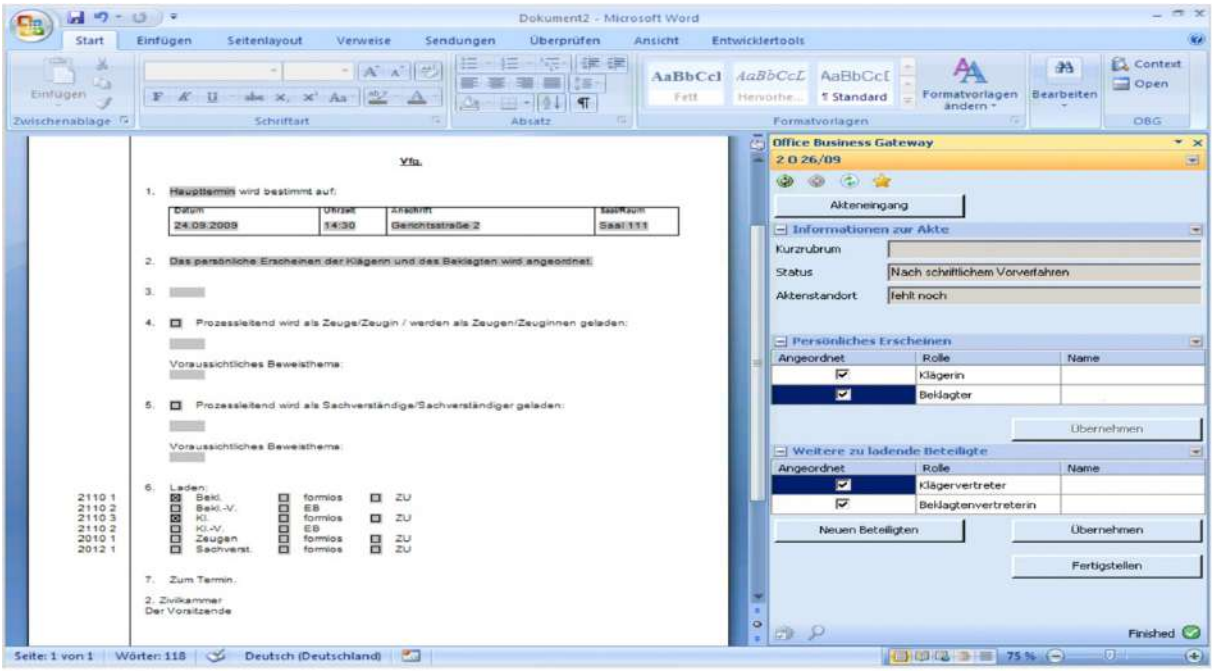
There are, in general, three different e-file systems in Germany. While North Rhine-Westphalia together with Bremen, Lower Saxony, Hessen, Saarland, and Saxony-Anhalt operate the e2A, Baden-Württemberg, Saxony, Schleswig-Holstein und Thuringia rely on the Electronic File System (eAS) and Bavaria, Berlin, Brandenburg, Hamburg, Mecklenburg-West Pomerania and Rhineland Palatinate make use of the Electronic Integration Portal (eIP), which the Austrian system is based on. The first pilots started in 2018.[286]

285 *Ministry of Justice,* Riigi Teataja https://www.riigiteataja.ee/index.html [01.08.2022].

286 *Altemeier/Lindinger/Schürger*, eAktenprojekte (e²A, eAS und eIP) – aktuelle Entwicklungen (2018); https://docplayer.org/124413298-Eaktenprojekte-e2a-eas-und-eip-aktuelle-entwicklungen.html [01.08.2022].

II. Ergonomic Electronic Workspace (e²A)

e²A is the system used by the federal government and six of the sixteen federal states of Germany.[287] They have divided the development task among themselves, the workspace environment for e²A (North Rhine-Westphalia), the word processing program e²T (Lower Saxony), the mailbox management system e²P (Hessen) and the courtroom management system e²S (Saxony-Anhalt).[288]



e2T is the main tool for the judicial body for the generation of documents and court decisions, administration of templates as well as for workflow management.[289]

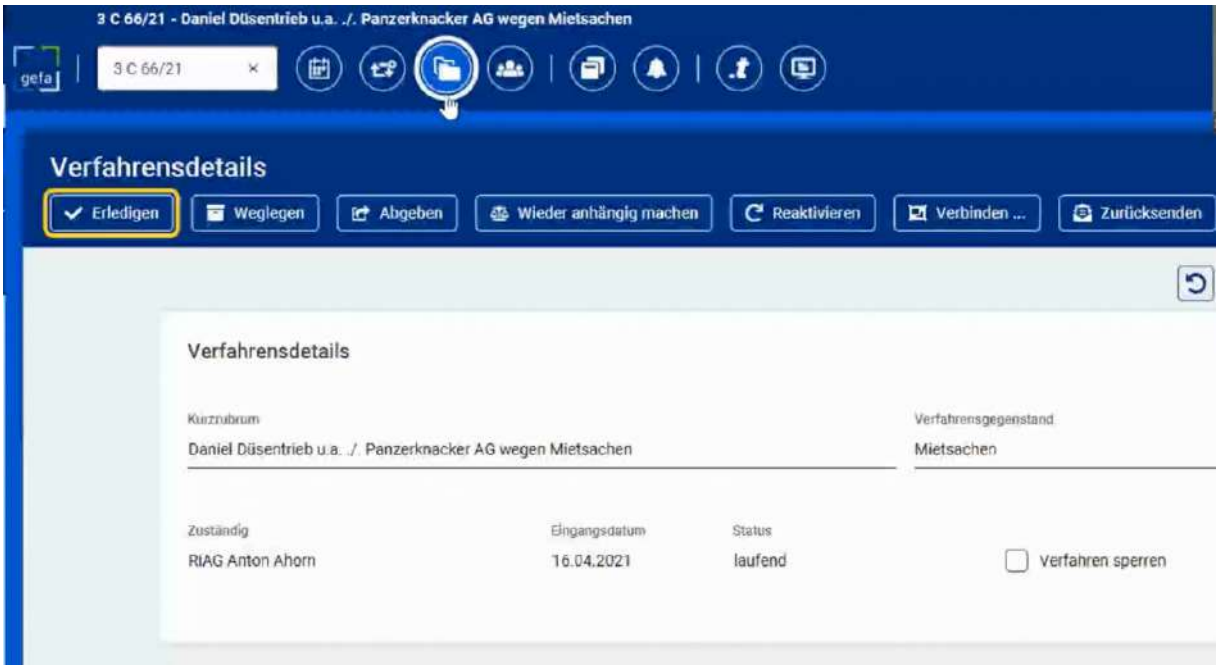
III. Joint specialised proceedings tool (GeFA)

287 *Saxon State Ministry of Justice and Democracy, Europe and Equality,* EDV-Länderbericht Niedersachsen (2021); https://justiz.de/laender-bund-europa/BLK/laenderberichte/niedersachsen.pdf;jsessionid=D19B666DD882F20714A01C2032167860 [01/08/2022].

288 *Saxon State Ministry of Justice and Democracy, Europe and Equality*, EDV-Länderbericht Niedersachsen (2021) p. 5.

289 *Voss/Pott*, Der e²-Verbund – Gemeinsam für ein ergonomisches Arbeitsumfeld im elektronischen Rechtsverkehr; https://docplayer.org/12660201-Der-e2-verbund-gemeinsam-fuer-ein-ergonomisches-arbeitsumfeld-im-elektronischen-rechtsverkehr.html [01/08/2022].

The E-Justice-Council and the Commission of the Federation and the Federal States for Information Technology have implemented an IT-architecture office for the elaboration of a governance in terms of a new area wide IT-tool, the GeFA.[290] On 20 September 2017, all federal states entered into an administrative agreement on the development of this joint tool.[291] The "joint specialised proceedings tool" (GeFa) is a modernised tool based on the ForumStar Application. It provides specialised modules for the different court proceedings and allows for the interconnection with e-file systems, word processing programs and mailbox tools of the federal states.[292] GeFa is currently available in MVP version, focusing on the civil proceedings.



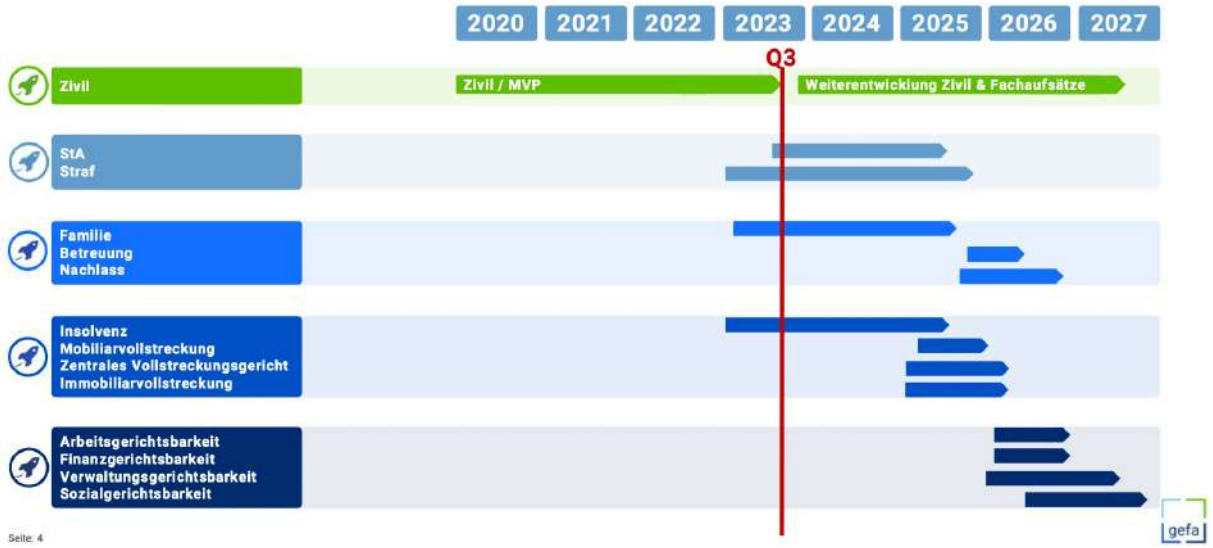
The start of the pilot is envisaged for 2023. Finally, it should replace all different solutions concerning the specialised procedures in the federal states and modernise the processes.[293]

290 See below chapter xy.

291 The administrative agreement of 20 September 2017 entered into force on 8. Dezember 2017; https://kleineanfragen.de/hessen/19/5748-gemeinsames-it-fachverfahren.txt

292 *Msg.group*, Für eine unabhängige und leistungsfähige Justiz, https://www.msg.group/branchen/mm-public-sector-de/ps-justiz-de [01/08/2022].

293 *Msg.group*, Für eine unabhängige und leistungsfähige Justiz, https://www.msg.group/branchen/mm-public-sector-de/ps-justiz-de; Westernacher Solutions GmbH, Das Gemeinsame Fachverfahren der Justiz, https://westernacher-solutions.com/wp-content/uploads/2021/11/Westernacher-Solutions-GmbH-Whitepaper-gefa.pdf [01/08/2022].



IV. Electronic Court and Administration Mailbox[294] (ECAM)

ECAM, which was implemented in 2004, corresponds to the Austrian system ELC and provides for double-encrypted communication of official documents and files between authenticated users. Since 2016, it has also got interconnected with the special electronic mailbox for lawyers. In 2019, with the special administration mailbox was introduced, a further developed and more secure version.[295]

V. E-Courts and Virtual meeting rooms

Art. 128a of the Code of civil procedure has provided for the use of videoconferencing for years. During the pandemic, the courts began to take advantage of the system. Via Virtual meeting rooms or Jitsu, both browser-based solutions, the court can allow the parties, their representatives, or witnesses to connect with the court and to hold the hearing online.[296]

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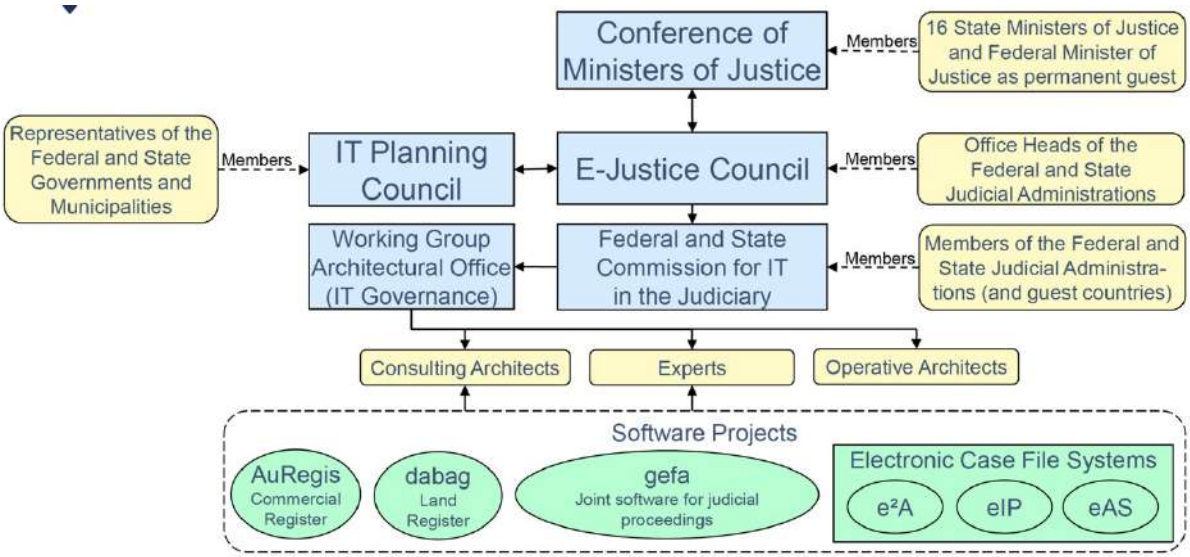
294 German term: "Elektronisches Gerichts- und Verwaltungspostfach (EGVP)".

295 *IT Lower Saxony*, Das besondere elektronische Behördenpostfach (beBPo); https://www.it.niedersachsen.de/bebpo/das-besondere-elektronische-behoerdenpostfach-bebpo-160601.html#:~:text=Beh%C3%B6rden%20sowie%20juristische%20Personen%20des,Austausch%20mit%20Gerichten%20zu%20er%C3%B6ffnen [01/08/2022].

296 *Ministry of Justice*, https://www.justiz.nrw.de/Gerichte_Behoerden/zentraler_dienstleister/videokonferenz/index.php [01/08/2022].

VI. Coordination of e-justice matters

Due to its strong federal and legal structure, the federal government is not competent to prescribe IT standards or software solutions in the federal states of Germany.[297] The great number of different software solutions not only results in multiple development and maintenance costs, but also causes a lack of interoperability and standards for data transfer.[298] Therefore, the Conference of Ministers, in the course of time, set up a structure of different bodies taking over the coordination and development of components or tools.[299] Centralised requirements engineering and development of standardised modular basic components for different software projects as well as the joint development of the GeFa-tool are some of the strategies being applied to master the more and more complex challenges of a digitised judiciary.[300]



297 *Ministry of Justice, E-Justice and Federalism in Germany, Presentation in Dusseldorf on 5 May 2022.*

298 *Ministry of Justice, E-Justice and Federalism in Germany, Presentation in Dusseldorf on 5 May 2022.*

299 *Ministry of Justice, E-Justice and Federalism in Germany, Presentation in Dusseldorf on 5 May 2022.*

300 *Ministry of Justice, E-Justice and Federalism in Germany, Presentation in Dusseldorf on 5 May 2022.*

4. Comparison and results

The development of both the digitisation of documents and processes has been unequal between the different countries, also as to the progress and extent. It has become apparent that the pandemic has made an important push towards implementing digital processes and using information and communication technologies.

There seems to be parallel goals and objectives in terms of achieving higher efficiency and diminishing the workload. There is on the one hand an important development of data management strategies both in Brazil and in the EU and the member states analysed. There is evidence of that in several projects and initiatives.

On the other hand, there are significant developments in terms of interfaces. Electronic hearings, service platforms and videoconferencing mechanisms are becoming more common standard practice. Implementation does not seem to be uniform, though.

D. ARTIFICIAL INTELLIGENCE

1. General remarks

The digitalisation of processes and services together with the digitisation of documents provided a unique opportunity for e-Justice. One the one hand, now there is a massive trove of data that can provide numerous insights, be it through “data analytics”, “big data”, or other techniques and technologies, or can serve as training data for artificial intelligence technologies. On the other hand, the automation of processes opens space for conceptualising, developing, and implementing new tools that may bring efficiency to the whole system. Artificial intelligence technologies can be allies in this process.

2. Artificial Intelligence in general

A. Brazil

The process of digitisation of the judiciary has been going on for about thirty years in Brazil. However, especially since the last decade, it has become increasingly clear that the simple digitisation of processes would not be enough to adapt the judiciary to the technological advances that come faster and faster. Moreover, digitisation by itself does not guarantee the necessary efficiency for the new reality. Many bottlenecks that occurred in the physical

processes ended up being repeated in the electronic processes. Bureaucratic issues, personnel, infrastructure, and legal innovations have required courts to invest in artificial intelligence. In other words, the replication of old problems typical of procedural dynamics and the challenges of digitisation have driven the use of Artificial Intelligence in recent years.

The history of the use of Artificial Intelligence in the Brazilian judiciary is quite recent, having increased exponentially since 2020. Several initiatives for different solutions have been developed and the role of CNJ, especially through Synapses (the national platform for managing and training AI models), is to ensure a strategy of constant sharing and innovation. This work methodology is important to avoid the mismatch of technological development among courts, avoid the waste of financial resources and promote the integration of the judiciary, a goal pursued since the beginning of the digitisation of the Brazilian justice system.

The implementation of Artificial Intelligence tools in the Brazilian judiciary is now regulated by Resolution 332/2020.[301] This normative rule, which specifies the ethical parameters to be used in the use of AI, was inspired by the European Ethical Charter on the Use of Artificial Intelligence in Judicial Systems and their Environment.[302] Throughout its articles there are several rules to guarantee fundamental rights and to determine oversight by judges. However, in a recent empirical survey of magistrates, it was found that more than sixty percent of them feel unprepared to perform this supervision and almost ninety percent state not having attended any type of training on AI applied to judicial practice in the last three years.[303] The history of the digitisation process of the Brazilian Judiciary that now finds a new moment in the implementation of AI tools is also related to the approval of new laws, such as the Civil Procedure Code of 2015, which replaced the 1973 Code, bringing new ways to legally ensure the reduction of the duration of the processes and aiming to streamline trial flows. One illustration of this *ethos* is the trial of repetitive claims and the strengthening of the use of precedents. This new procedural dynamic supports, albeit indirectly, the use of AI in tasks such as document identification of claims and suggestion of precedents, for example.[304] Thus, the judiciary is heavily investing in solutions involving AI, while ethical and operational challenges persist.

301 *RESOLUÇÃO No 332, https://atos.cnj.jus.br/atos/detalhar/3429 [01/08/2022].*

302 *CEPEJ European Ethical Charter on the use of artificial intelligence (AI) in judicial systems and their environment, https://www.coe.int/en/web/cepej/cepej-european-ethical-charter-on-the-use-of-artificial-intelligence-ai-in-judicial-systems-and-their-environment [01/08/2022].*

303 PRADO, Eunice M.B.; MÜNCH, Luciane A. Corrêa; VILLARROEL, Márcia A. Corrêa Ughini."Sob controle do usuário": formação dos juízes brasileiros para o uso ético da IA no Judiciário 2022; *https://www.trf4.jus.br/trf4/controlador.php?acao=pagina_visualizar&id_pagina=2287* [01/08/2022].

304 The position of the National Council of Justice, CNJ, has been strengthened in the new Civil Procedure Code, particularly in terms of fostering the implementation of technologies and innovation. This is particularly true from art. 196, CPC 2015: "*Art. 196. Compete ao Conselho Nacional de Justiça e, supletivamente, aos tribunais, regulamentar a prática e a comunicação oficial de atos processuais por meio eletrônico e velar pela compatibilidade dos sistemas, disciplinando a incorporação progressiva de novos avanços tecnológicos e editando, para esse fim, os atos que forem necessários, respeitadas*

B. European Union

Obsessive collection of data and a lack of transparency in handling of information have not only caused distrust in the population but also called to action the European institutions. Like the regulation (EU) 2016/679 on data protection,[305] the actual proposal for a Regulation on Artificial Intelligence (Artificial Intelligence Act) could have far-going repercussions on the judiciary.[306] The latter defines AI-systems as software which can generate, for a given set of human-defined objectives, outputs such as content, predictions, recommendations, or decisions influencing the environments they interact with. Pursuant to Art. 6 of the proposal of the Artificial Intelligence Act, AI systems mentioned in Annex III, which relate to the administration of justice shall be considered high-risk. These systems are defined as "AI systems intended to assist a judicial authority in researching and interpreting facts and the law and in applying the law to a concrete set of facts." Without any doubt, the requirements set for these systems may affect the further development of a fast-growing sector of the past two years. Under Annex I of the proposal, this software comprises (a) machine learning approaches, including supervised, unsupervised and reinforcement learning, using a wide variety of methods including deep learning; (b) logic- and knowledge-based approaches, including knowledge representation, inductive (logic) programming, knowledge bases, inference, and deductive engines, (symbolic) reasoning and expert systems; and (c) statistical approaches, Bayesian estimation, search and optimisation methods.

as normas fundamentais deste Código." In an unofficial translation it would mean: Art. 196. It is up to the National Council of Justice (CNJ) and, in a supplementary manner, the courts, to regulate the performance and official communication of procedural acts by electronic means and to safeguard the compatibility of the systems, regulating the progressive incorporation of new technological advances and determining, for this purpose, the act deemed necessary, in pursuance of the fundamental rules of this Code; https://www.academia.edu/34625082/Brazilian_Code_of_Civil_Procedure_English_Version [01/08/2022].

305 Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing directive 95/46/EC (General Data ProtectionRegulation); https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32016R0679&from=EN [01/08/2022].

306 *Proposal for a Regulation of the European Parliament and of the Council laying down harmonised rules on Artificial Intelligence (Artificial Intelligence Act) and amending certain union legislative acts, COM(2021) 206 final; https://eur-lex.europa.eu/resource.html?uri=cellar:e0649735-a372-11eb-9585-01aa75ed71a1.0001.02/DOC_1&format=PDF [01/08/2022].*

3. Tools

A) Brazil

Since 2020, the CNJ has maintained the website "Projects with Artificial Intelligence in the Judicial Branch", which provides updated data on initiatives of this type in the country. There were forty-one projects listed in thirty-two courts as of May 2022.[307] It is important to highlight that the vast majority of the tools were developed by the courts in partnership with public agencies, but there are cases of partnerships with institutions of private sector, academia, or civil society. This pulverisation of solutions in part replicates the development of electronic processes systems in the past and can be attributed to some extent to the significant autonomy of the different courts and tribunals.

The platform Synapses is an important national solution that aims at guaranteeing a level of integration and sharing of AI tools among different courts in the country. This platform is made available and managed jointly by the CNJ and the Court of Justice of Rondônia and its function is to create, train, maintain and ensure access to AI models. In addition, Synapses works as a kind of marketplace for AI microservices and already offers about thirty different models, which should be expanded progressively.

Some of the functionalities available on Synapses are supervised training for machine learning models, model versioning, model auditing, simplified dataset import interface, multi-tenant environment and reinforcement learning. There are systems that operate in conjunction with Synapses, such as Iris, API for document OCR, Prisma, API for extracting metadata (parser) from documents, and Codex, which consolidates the procedural bases that provide the data for creating new AI models[308].

Several artificial intelligence tools will be presented below according to their functionality and origin.

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307 It is not possible to say that these are all the initiatives in progress, as the update depends on information provided by the courts themselves and on the appropriate framework of what is or is not an AI tool. In official presentations by representatives of Brazilian Judiciary, the numbers go up to 111 initiatives and fifty-three courts and tribunals testing, developing or implementing AI tools. See for instance: https://brasil.un.org/pt-br/188306-pesquisa-identifica-111-projetos-de-inteligencia-artificial-no-judiciario.

308 https://www.cnj.jus.br/wp-content/uploads/2020/05/Inteligencia_artificial_no_poder_judiciario_brasileiro_2019-11-22.pdf [01/08/2022].

I. Classification tools

Repetitive and bureaucratic overwork is one of the biggest challenges facing the judiciary. Attempts to simplify tasks and find more efficient and agile ways to satisfy the needs of judicial processes have been tried for a long time, with strategies ranging from hiring specialised personnel to implementing different workflows. These initiatives proved to be insufficient for several reasons, including the increase in the number of cases and the need to maintain bureaucratic procedures capable of guaranteeing legal certainty, especially in the analysis and classification of judicial processes. One of the most promising solutions has been the creation and use of classification tools using AI capable of performing much of the repetitive work more efficiently. They mostly work using machine learning techniques and seem to focus chiefly in identifying either the nature of specific documents or suggesting their link to other cases or case law. They may work isolated or in connection with other functionalities such as grouping of similar cases.

01. VICTOR

A machine learning-based tool created in 2018 by a partnership between the University of Brasilia and the Supreme Federal Court. Its functionality is the classification of cases in terms of theme and identifying whether a particular case fits the criteria of a general repercussion theme. This task used to take about forty-four minutes when performed by one person, but with the use of VICTOR this time has been reduced to five seconds.[309] The tool's accuracy level has been publicised as high.[310]

02. Sócrates 2.0

Updated version of the tool for identifying which matters are discussed in special appeals to the Superior Court of Justice[311]. It is capable of automatically identifying the articles of the Constitution that allow the appeal to be filed, the articles of law that were supposedly violated,

309 *Convergência Digital,* Victor, a IA do STF, reduziu tempo de tarefa de 44 minutos para cinco segundos; https://www.convergenciadigital.com.br/Inovacao/Victor%2C-a-IA-do-STF%2C-reduziu-tempo-de-tarefa-de-44-minutos-para-cinco-segundos-52015.html?UserActiveTemplate=site [01/08/2022].

310 *Portal do Governo Brasileiro,* Direito, Racionalidade e Inteligência Artificial; http://dria.unb.br/teste-top [01/08/2022]

311 *SinTSE*, STJ - Especial - Revolução tecnológica e desafios da pandemia marcaram gestão do ministro Noronha na presidência do STJ; https://www.stj.jus.br/sites/portalp/Paginas/Comunicacao/Noticias/23082020-Revolucao-tecnologica-e-desafios-da-pandemia-marcaram-gestao-do-ministro-Noronha-na-presidencia-do-STJ.aspx [01/08/2022].

and the "leading cases" that justify a potential divergence.[312] Socrates creates a word cloud and, after user validation, presents the possibly inadmissible points. The results of the analysis made by the tool can also be corrected by the user, ensuring Socrates continues to learn and be more accurate.

03. LEIA (Leal Intelligent Advisor) Precedents

It is an AI tool developed by a private company in partnership with several states' courts where it has already been tested (Acre, Alagoas, Amazonas, Ceará e Mato Grosso do Sul seem to be among them). It has the functionality of identifying precedents in repetitive appeals and cases of general repercussion[313]. Under Brazilian law, cases that are linked to this type of appeal (to cases being considered under a general repercussion procedure) must remain suspended until a decision is made by the higher courts, and therefore the identification of such appeals in an agile manner reduces the time spent on the analysis of proceedings that should actually be stayed.

04. Hercules

A robot that uses artificial intelligence used by the Court of Justice of Alagoas to identify and classify petitions and applications directed to the fiscal court. It is able to identify the kind of petition (whether they are a matter of enforcement, freezing of assets, among others), and place them in the appropriate queue. It is based on these queues that petitions are forwarded to the particular person or institution in charge. The tool substitutes the work previously performed by a court official with a reported high accuracy.[314]

05. Radar

A platform developed and used by the Court of Justice of Minas Gerais that allows "smart research" based on keywords, facilitating the identification of repetitive claims[315]. Thus, the court can quickly identify large numbers of similar cases and may adjudicate them together.

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312 One should note that appeals to the Superior Court of Justice (STJ) should be based on specific circumstances as for instance a divergence in the interpretation of federal law among different tribunals in the country. Identifying where the divergence is may be of significant importance.

313 *Justiça Digital;* https://justicadigital.com/leia-precedentes-inteligencia-artificial/ [01/08/2022].

314 *Ufal*, Robô Hércules classifica mais de 11 mil petições no TJ de Alagoas https://ufal.br/ufal/noticias/2021/4/robo-hercules-classifica-mais-de-11-mil-peticoes-e-agiliza-trabalho-do-tj-de-alagoas [01/08/2022].

315 *Tribunal de Justiça do Estado de Minas Gerais,* Julgament Virtual; https://www.tjmg.jus.br/portal-tjmg/hotsites/relatorio-de-gestao-2018-a-2020/julgamento-virtual.htm#.YoEtGvPMJ-U [01/08/2022].

06. Jerimum

A tool tested by the Court of Justice of Rio Grande do Norte. Its main features are document reading and classification.[316] By this way, it is able to define the type of action by "reading" the process.

07. Eproc - TJ-RS

The electronic process system of the Court of Justice of Rio Grande do Sul also uses artificial intelligence. In cases of tax foreclosures, for example, the system is able to classify the demands received and, through the information extracted and the learning mechanisms, indicate which measures should be taken[317]. In addition to reading, Eproc is also able to suggest document completion.

08. Tucurujis Artificial Intelligence – Tia

A robot created and used at the Court of Justice of Amapá that is designed for the analysis of initial applications for public treasury cases. The system, by identifying repetitive claims, groups the cases so that the judge can decide on all of them at once[318].

09. Athos

A system based on Artificial Intelligence used at the Superior Court of Justice. The main task of Athos is to verify whether new cases are submitted to repetitive claims or not. The tool is able to identify whether or not the case is in accordance with the understanding of the court, whether or not the matter is relevant, and also to monitor the overcoming or distinction of precedents.[319]

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316 *Bernardo de Azevedo*, TJRN investe em sistemas para automatizar ações repetitivas, https://bernardodeazevedo.com/conteudos/tjrn-investe-em-sistemas-para-automatizar-acoes-repetitivas/ [01/08/2022].

317 *TJRS*, https://www.tjrs.jus.br/novo/noticia/inteligencia-artificial-avanca-nos-executivos-fiscais-estaduais/ [01/08/2022].

318 *TJAP*, Robô de inteligência artificial é desenvolvido no TJAP para agilizar andamento de processos com demandas repetitivas; https://www.tjap.jus.br/portal/publicacoes/noticias/9768-%C2%B4rob%C3%B4-de-intelig%C3%AAncia-artificial-%C3%A9-criado-no-tjap-para-agilizar-andamento-de-processos-com-demandas-repetitivas.html [01/08/2022].

319 *SinTSE*, STJ - Especial - Revolução tecnológica e desafios da pandemia marcaram gestão do ministro Noronha na presidência do STJ; https://www.stj.jus.br/sites/portalp/Paginas/Comunicacao/Noticias/23082020-Revolucao-tecnologica-e-desafios-da-pandemia-marcaram-gestao-do-minis-

10. Elis

It is an Artificial Intelligence tool used in the Court of Justice of Pernambuco for the screening of tax executions. The solution not only identifies and classifies the processes. The system is operating together with Synapses[320] and is capable of generating and signing minutes and orders, according to the judge's interest. To get an idea of the impact of using Elis, the volume of analysis that used to take a year and a half is now done in fifteen days in an even greater number of processes.[321]

11. TOTH

It is an Artificial Intelligence tool implemented by the Court of Justice of the Federal District and Territories used for identification of legal instruments and procedural classification.[322]

12. RAFA 2030 - Artificial Networks focused on the 2030 Agenda of the United Nations

It is an Artificial Intelligence tool developed by the Federal Supreme Court (STF) that uses neural networks with semantic comparison to help judges identify the Sustainable Development Goals of the United Nations Agenda 2030 in the text of judgments or initial petitions in STF cases.[323]

There are other similar AI tools that serve for classification purposes, among them are: the Berna, which identifies legal theses contained in the complaint (the initial petition), developed by

tro-Noronha-na-presidencia-do-STJ.aspx [01/08/2022].

320 *TJPE*, TJPE usará inteligência artificial para agilizar processos de execução fiscal no Recife - Início; https://www.tjpe.jus.br/inicio?p_p_id=101&p_p_lifecycle=0&p_p_state=maximized&p_p_mode=view&_101_struts_action=%2Fasset_publisher%2Fview_content&_101_returnToFullPageURL=https%3A%2F%2Fwww.tjpe.jus.br%2Finicio%3Fp_auth%3DbArS1onF%26p_p_id%3D3%26p_p_lifecycle%3D1%26p_p_state%3Dnormal%26p_p_state_rcv%3D1&_101_assetEntryId=2079372&_101_type=content&_101_urlTitle=tjpe-usara-inteligencia-artificial-para-agilizar-processos-de-execucao-fiscal-no-recife&inheritRedirect=true [01/08/2022].

321 *TJPE*, TJPE disponibiliza ferramenta de IA para execução fiscal em Programa de formação do CNJ - Ultimas; https://www.tjpe.jus.br/-/tjpe-disponibiliza-ferramenta-de-inteligencia-artificial-para-execucao-fiscal-em-programa-de-formacao-do-cnj [01/08/2022].

322 *MELO, Jairo Simão Santana; NASCENTE, Verônica Ferreira; SANTOS, Luiz Eduardo dos. TOTH,* Solução inteligente preditora de classe e assuntos para processos autuados no PJe. 2021; CNJ; https://www.cnj.jus.br/ojs/index.php/revista-cnj/article/view/24 [01/08/2022].

323 *STF*, STF lança RAFA, ferramenta de Inteligência Artificial para classificar ações na Agenda 2030 da ONU; https://portal.stf.jus.br/noticias/verNoticiaDetalhe.asp?idConteudo=486889&ori=1 [01/08/2022].

the Court of Justice of Goiás; classification AI (nameless), which identifies repetitive precedents, developed by the Court of Justice of Piaui; Larry Robot, which identifies and groups processes, developed by the Court of Justice of Paraná; the Increased Jurisprudence Search Mechanisms identifies decisions with binding effect and presents the results for case law research, developed by the Court of Justice of Santa Catarina; MINERJUS uses machine learning to classify initial petitions by subject matter, developed by the Court of Justice of Tocantins; SINARA uses a transfer learning mechanism to extract legal information from a pleading that can be used to solve other cases, developed by the 3rd Federal Regional Court (TRF-3); SIGMA uses information extracted from SINARA to perform model centralisation and ranking, also developed by the 3rd Federal Regional Court; Grouping Appeals by Similarity graphically presents the appeals filed according to sentence similarities and allows the execution of actions in blocks, developed by the 4th Federal Regional Court (TRF-4); AI for Clustering of Processes groups cases and presents decisions made in similar cases to facilitate the preparation of draft decisions, developed by the 4th Regional Labour Court; GEMINI brings processes together based on similarity of content, implemented in the 5th, 7th, 15th and 20th Regional Labour and the Superior Council of Labour Court – SCSJT; and Magus, which uses relevant legal understandings and previous court decisions to analyse presented claims, implemented in 9th Regional Labour Court.[324]

II. Tools that suggest draft decisions

As noted before, the Brazilian Judiciary has one of the lowest number of judges per capita and one of the highest levels of litigation. This generates a substantial workload per judge (on average more than 6000 cases not to mention reviews). This has led so far to a significant backlog. In order to boost productivity, AI tools designed to analyse cases and suggest decisions have been seen as promising solutions. Although they are not so widespread among the Courts and Tribunals, there are already some experiments under development.

01. Clara

It is a tool under development at the Court of Justice of Rio Grande do Norte that is able to read documents, suggest corrections or further actions needed and even, in some circumstances, when, for instance, a debit was already settled, may prepare a draft decision.[325]

324 *CNJ*; https://paineisanalytics.cnj.jus.br/single/?appid=29d710f7-8d8f-47be-8af8-a9152545b771&sheet=b8267e5a-1f1f-41a7-90ff-d7a2f4ed34ea&lang=pt-BR&opt=ctxmenu,currsel [01/08/2022].

325 *Bernardo de Azevedo*, TJRN investe em sistemas para automatizar ações repetitivas; https://bernardodeazevedo.com/conteudos/tjrn-investe-em-sistemas-para-automatizar-acoes-repetitivas/ [01/08/2022].

Clara used deep learning techniques. All tasks and drafts depend on the review of a court clerk or a judge.

02. Janus

A robot based on Artificial Intelligence that is used at the Regional Electoral Court of Bahia. Its initial functionality was to analyse the accountability of the electoral processes. It operates in conjunction with Synapses and is capable of generating draft sentences for the judge to review and sign.[326]

03. SIGMA

An Artificial intelligence tool developed by the Federal Regional Court of the 3rd Region. The objective of its creation was to streamline the process of preparing procedural documents. Using AI, Sigma is able to analyse processes and offer the most relevant data for drafting decisions.[327] In the Courts, it is very important to identify the legal basis of the pleadings, so that the judge can know if they agree or disagree with their understanding on the matter. Sigma can also perform this kind of task.

04. ALEI - Intelligent Legal Analysis

An AI-based solution created by the Federal Regional Court of the 1st Region. It can analyse the content of an appeal and group it according to the subject matter. After this verification, the system can suggest draft model decisions based on precedents and case law from the Tribunal and the country's Superior Courts[328].

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326 *Tribunal Regional Eleitoral-BA*, Automação e inteligência artificial: robôs do novo sistema Janus vão dinamizar processos no TRE-BA; https://www.tre-ba.jus.br/imprensa/noticias-tre-ba/2021/Junho/automacao-e-inteligencia-artificial-robos-do-novo-sistema-janus-vao-dinamizar-processos-no-tre-ba [01/08/2022].

327 *Justiça Federal,* Projeto SIGMA, do TRF3, ganha prêmio Innovare 2021; https://web.trf3.jus.br/noticias-sjms/Noticiar/ExibirNoticia/11-projeto-sigma-do-trf3-ganha-premio-innovare-2021 [01/08/2022].

328 *INSTITUCIONAL*, Projeto Análise Legal Inteligente (Alei) é apresentado ao Presidente do TRF 1ª Região e equipe; https://portal.trf1.jus.br/portaltrf1/comunicacao-social/imprensa/noticias/institucional-projeto-analise-legal-inteligente-alei-e-apresentado-ao-presidente-do-trf-1-regiao-e-equipe.htm [01/08/2022].

There are other similar AI tools, such as Eproc, developed by the Federal Regional Tribunal N° 4 and the Analysis of assumptions Review Appeal[329], which generates certificates of compliance with some necessary requirements for analysis of the admissibility of the appeal between instances, implemented in the Labour Court of the 8th Region.

Additionally, there is the AI "Dra. Luiza"[330], a so-called "lawyer robot" developed by a Brazilian start-up based on Artificial Intelligence. The tool combines elements of data mining, big data, natural language, and machine learning. Among its main functionalities are: sharing of legal instruments models, support using AI for petitioning, use of internal data to generate legal instruments, extraction and comparison of data from public and internal databases, monitoring of results and visualisation of procedural data, and a control panel.

III. Administrative and Supporting Tools

Certain tasks, such as freezing of assets and expedition of judicial orders tend to be relatively repetitive and depend less on constant oversight. Some courts and tribunals have developed AI tools that are capable of collaborating in the administrative tasks, reducing the workload and speeding up activities that used to be manually handled by courts' officials.

01. Poti

A tool used at the Court of Justice of Rio Grande do Norte. It works with tax executions and its main functionalities are freezing and unfreezing assets, issuing certificates, and managing the transfer of assets. As an example of its effectiveness, the tool can do the same workload that a court official would take a day in 35 seconds.[331]

02. Mandamus

It is a system created in partnership between the Court of Justice of Roraima and the University of Brasília, whose main function is the automation of the service of documents (warrants included). With the use of this tool, the public official in charge only needs to worry

329 *CNJ*; https://paineisanalytics.cnj.jus.br/single/?appid=29d710f7-8d8f-47be-8af8-a9152545b771&sheet=b8267e5a-1f1f-41a7-90ff-d7a2f4ed34ea&lang=pt-BR&opt=ctxmenu,currsel [01/08/2022].

330 *Legal Labs,* DRA Luiza, https://legalabs.com.br/ [01/08/2022].

331 *Universidade Federal Fluminense*, Inteligência Artificial no mundo jurídico; https://direitodofuturo.uff.br/2020/10/20/inteligencia-artificial-no-mundo-juridico/?utm_source=rss&utm_medium=rss&utm_campaign=inteligencia-artificial-no-mundo-juridico [01/08/2022].

about serving the document or carrying out the warrant[332]. The system runs on a smartphone and the official, when serving a document, for example, can even print it on a portable printer if necessary. It is estimated that the use of this AI solution can reduce the duration of the process by six to twelve months,[333] today the average time of a process is four and a half years.

03. Horus

System based on Artificial Intelligence used at the Court of Justice of the Federal District and Territories, whose main function is the digitisation of processes for the PJe. Horus is capable of recognising document codes by means of OCR, besides recovering procedural movements, classifying, and certifying the authenticity of documents.[334]

04. Bem-te-vi

Solution based on artificial intelligence by the Superior Labour Court, whose main purpose is procedural management. It allows the monitoring of the duration of proceedings, indexing by thematic groups, preclusion analysis, and textual searches of decisions from the Regional Labour Courts[335].

05. Conciliates JT

Conciliates JT is a tool created by the Regional Labour Court of the 12th Region that uses statistical models and artificial intelligence to calculate - using the court's database - the chances of success of a given case. The tool generates a report with the probability of success

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332 *ASSP*, MANDAMUS – Automação de processos e distribuição eletrônica de mandados começa a funcionar no TJRR; https://www.aasp.org.br/noticias/mandamus-automacao-de-processos-e-distribuicao-eletronica-de-mandados-comeca-a-funcionar-no-tjrr/ [01/08/2022].

333 *Portal do Governo Brasileiro*, Direito, Racionalidade e Inteligência Artificial; http://dria.unb.br/teste-top [01/08/2022].

334 *TJDFT*, Sistema de Inteligência Artificial do TJDFT é apresentado em congresso de inovação no Judiciário; https://www.tjdft.jus.br/institucional/imprensa/noticias/2020/dezembro/sistema-de-inteligencia-artificial-do-tjdft-e-apresentado-em-congresso-de-inovacao-no-judiciario-e-controle [01/08/2022].

335 *TST*, TST vence Prêmio Inovação Judiciário Exponencial com o programa Bem-te-Vi - TST; https://www.tst.jus.br/-/tst-vence-pr%C3%AAmio-inova%C3%A7%C3%A3o-judici%C3%A1rio-exponencial-com-o-programa-bem-te-vi [01/08/2022].

and recommends a settlement. The proposed settlement is made available in in the PJe system and provides the basis for prioritising or suggesting a case to the placed at Conciliation Centres' agenda[336]. One should note a major push towards facilitating agreements through conciliation in the country. The litigating culture tends to limit the success of such agreements.

06. Ámon

Ámon is a security system based on artificial intelligence and facial recognition used for monitoring the entry of people in the Court of Justice of the Federal District and Territories. The tool is product of a partnership between the Data Science Service (SERCID) and the Institutional Security Office (ASI) of the TJDFT[337].

There are other similar AI tools such as LIA (Artificial Intelligence Logic) - CJF, a Chatbot developed by the Regional Electoral Court of the Federal District, BEL, another Electoral Chatbot developed by the Regional Electoral Court of Espirito Santo, Celina Project developed by the Regional Electoral Court of Rio Grande do Norte, Artificial Intelligence Sophia developed by the Court of Justice of São Paulo, Artiu developed by the Court of Justice of the Federal District, "Natureza Conciliação "developed by the Court of Justice of the Federal District in order to facilitate conciliations; "Peticionamento Inteligente" developed by the Court of Justice of Rondônia, Tax Enforcement Petition Classifier developed by the Court of Justice of Santa Catarina TJ-SC, Classification of Initial Petitions of Expert Reports implemented in the 5th Regional Federal Court, Spelling and Grammar Check developed by the Superior Labour Court as a "Language Tool", and CAUBOT developed by the 15th Regional Labour Court to serve as chatbot.

Additionally, there are initiatives from the Federal Court of Accounts (TCU) that although not part of the Brazilian judicial system - they are a part of the Legislative -, the AI solutions developed may have a bearing as they may be integrated with the system as means of overall support. They are the following:

336 *TRT-SC*, TRT-SC desenvolve ferramenta que utiliza inteligência artificial para estimar chances de acordos judiciais | Tribunal Regional do Trabalho da 12ª Região; https://portal.trt12.jus.br/noticias/trt-sc-desenvolve-ferramenta-que-utiliza-inteligencia-artificial-para-estimar-chances-de [01/08/2022].

337 *MELO*, Jairo Simão Santana; NEVES, Thiago Arruda; NETO, Celso Oliveira. 2021. AMON: Controle de acesso do jurisdicionado no TJDFT a partir de técnicas de reconhecimento facial; *CNJ*, AMON; https://www.cnj.jus.br/ojs/index.php/revista-cnj/article/view/157 [01/08/2022].

07. Alice - Bid Analysis System

Alice is a robot used to read bid notices and price register minutes and, by doing so, identify fraud in public procurement processes. It operates at the Federal Government level and in some public agencies and is able, for example, to identify whether two companies with the same partners are bidding for the same tender. After performing the diagnoses, it generates a document calling the auditors' attention to possible fraud[338].

08. Monica – Integrated Monitoring for Procurement Control

Monica is a procurement tracking panel used by the Federal Audit Court to monitor purchases made at the federal level. It monitors purchases by the Executive, Legislative, Judiciary, and Federal Public Ministry. This panel allows filters to be applied and data to be exported to Excel[339].

09. Sofia - System of Guidance on Facts and Evidence for the Auditor

Sofia is a tool used by the Federal Audit Court that offers the auditor information to help them in the preparation of reports and audits. It can review an audit and correlating information, highlighting, for example, if the company under analysis has previously entered into contracts with the Federal Government or has been punished in proceedings at the court[340].

10. Adele - Electronic Bidding Dispute Analysis

Adele is a panel that allows the visualisation of each electronic purchase tender[341]. Among the features, it is possible to check the chronology of the bids made by participating companies,

338 *Brasil país digital*, Alice e Victor: uma dupla criada pela inteligência artificial; https://brasilpaisdigital.com.br/alice-e-victor-uma-dupla-criada-pela-inteligencia-artificial/ [01/08/2022].

339 COSTA, Marcos Bemquerer; BASTOS, Patrícia Reis Leitão. Alice, Monica, Adele, Sofia, Carina e Ágata: o uso da inteligência artificial pelo Tribunal de Contas da União. **Controle Externo**: Revista do Tribunal de Contas do Estado de Goiás, Belo Horizonte, ano 2, n. 3, p. 11-34, jan./jun. 2020; Artigos; https://revcontext.tce.go.gov.br/index.php/context/article/view/59/57 [01/08/2022].

340 COSTA, Marcos Bemquerer; BASTOS, Patrícia Reis Leitão. Alice, Monica, Adele, Sofia, Carina e Ágata: o uso da inteligência artificial pelo Tribunal de Contas da União. **Controle Externo**: Revista do Tribunal de Contas do Estado de Goiás, Belo Horizonte, ano 2, n. 3, p. 11-34, jan./jun. 2020; Artigos; https://revcontext.tce.go.gov.br/index.php/context/article/view/59/57 [01/08/2022].

341 It is a public procurement modality present in the Brazilian legislation.

as well as the data of these companies. Adele allows you to identify, for example, if there is more than one participating company using the same IP, which makes it possible to check for unfair or even fraudulent conduct[342].

11. Agata - Application for Accelerated Textual Analysis Generation

Agata is an AI-based tool developed by the TCU that uses machine learning to refine and update the alerts issued by the Alice[343].

There are other similar AI tools, such as: LIA (Artificial Intelligence Logic), a Chatbot implemented by the Federal Council of Justice that uses natural language to provide information; BEL, developed by the Regional Electoral Court of Espírito Santo, another Electoral Chatbot that uses natural language to provide electoral information (voting location, for example) to citizens; Celina Project, virtual attendant providing election information, developed by the Regional Electoral Court of Rio Grande do Norte; Artificial Intelligence Sophia identifies which is the best course for the manager to take according to his subordinates' evaluation, developed by the Court of Justice of São Paulo; Artiu adjusts the addresses of the warrants to be served, developed by the Court of Justice of the Federal District; "Natureza Conciliação", developed by the Court of Justice of the Federal District in order to facilitate conciliations; "Peticionamento Inteligente" receives the circumstantial terms (a procedure similar to a police inquiry, but used for crimes of less offensive potential[344]) and standardises them by generating a pre-form that will be analysed by a human and sent to PJe, developed by the Court of Justice of Rondônia; Tax Enforcement Petition Classifier classifies and groups execution processes so they can be moved together, developed by the Court of Justice of Santa Catarina TJ-SC; the Classification of Initial Petitions of Expert Reports assists in screening medical examinations, implemented in the 5th Regional Federal Court; Spelling and Grammar Check used by the Superior Labour Court is a "Language Tool"; and also CAUBOT, tool that uses the statistics of the most common demands as a basis, developed by the 15th Regional Labour Court to serve as chatbot.[345]

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342 COSTA, Marcos Bemquerer; BASTOS, Patrícia Reis Leitão. Alice, Monica, Adele, Sofia, Carina e Ágata: o uso da inteligência artificial pelo Tribunal de Contas da União. **Controle Externo**: Revista do Tribunal de Contas do Estado de Goiás, Belo Horizonte, ano 2, n. 3, p. 11-34, jan./jun. 2020; Artigos; https://revcontext.tce.go.gov.br/index.php/context/article/view/59/57 [01/08/2022].

343 COSTA, Marcos Bemquerer; BASTOS, Patrícia Reis Leitão. Alice, Monica, Adele, Sofia, Carina e Ágata: o uso da inteligência artificial pelo Tribunal de Contas da União. **Controle Externo**: Revista do Tribunal de Contas do Estado de Goiás, Belo Horizonte, ano 2, n. 3, p. 11-34, jan./jun. 2020; Artigos; https://revcontext.tce.go.gov.br/index.php/context/article/view/59/57 [01/08/2022].

344 *MSJ.,* O termo circunstanciado de ocorrência é procedimento administrativo que substitui o auto de prisão em flagrante e o inquérito policial; https://meusitejuridico.editorajuspodivm.com.br/2020/12/03/o-termo-circunstanciado-de-ocorrencia-e-procedimento-administrativo-que-substitui-o-auto-de-prisao-em-flagrante-e-o-inquerito-policial/ [01/08/2022].

345 https://paineisanalytics.cnj.jus.br/single/?appid=29d710f7-8d8f-47be-8af8-

B. European Union

I. IZZY

In December 2021, DG Justice and Consumers of the European Commission launched a chatbot on consumer rights related to online or offline shopping. Izzy is currently only available in French.[346]

C. Austria

II. Anonymisation of court decisions

Anonymisation comprises not only personal data directly linked to the parties or accused (names, dates of birth of addresses) but also indirect information which allows the reader to draw conclusions from and to identify a person by putting several pieces together (professions, property, or other unique characteristics). While the first category of data is relatively easy to be detected and processed, indirect information requires much deeper knowledge of the concrete file and, subsequently, more highly qualified staff in the courts' registries to meet with data protection requirements. While all high courts (the Supreme Court,[347] the Constitutional Court and the Administrative Court) largely publish their decisions in the Legal Information System,[348] it does not apply to lower instance courts, whose decisions, at the moment, are not fully traceable. This is mainly due to the lack of adequate staffing. The obligation for them to publish their decisions only exists if sufficient staff and technical requirements are available.[349] For these reasons, the Federal Ministry of Justice started, in accordance with the 2019-2023 e-Justice Action Plan, an AI project aiming at anonymising judicial decisions and thereby promoting transparency and publicity. The first step is to make the algorithms recognise entities and to make them to be used in different contexts by replacing them with placeholders.[350] The Federal Ministry of Justice decided, by reason of high licence costs, to use

a9152545b771&sheet=b8267e5a-1f1f-41a7-90ff-d7a2f4ed34ea&lang=pt-BR&opt=ctxmenu,currsel [01/08/2022].

346 *European e-Justice Portal*, Izzy, https://e-justice.europa.eu/sitenewsshow?plang=en&newsId=269 [01/08/2022].

347 Article 15 of the Supreme Court Act.

348 Legal Information System Act; Original title: "Bundesgesetz über das Bundesgesetzblatt 2004 (Bundesgesetzblattgesetz – BGBlG)"; https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=20002988 [01/08/2022].

349 Article 48a of the Court Organisation Act in conjunction with Article 15 of the Supreme Court Act; https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=10000009 [01/08/2022].

350 *Steinbauer, Anonymisation of court decisions & AI, Presentation at the Federal Ministry of Justice on 02/05/2022.*

an open-source-based infrastructure.[351] The solution is based on three different approaches combined for maximum output: the use of procedure-related data from the CCMS, machine learning and natural language processing tools, and feedback- and quality audit-based training as well as improvement of machine learning algorithms.[352] The machine learning stream is built on three NLP-libraries (Stanford, Spacy and Flair) combined with search-, rule- and dictionary-based services.[353] The combiner subsequently presents two solutions, an annotated version with all the proposals for anonymisation highlighted and an adjusted version.[354] The tool also self-evaluates the quality and reliability of the proposal displayed by a colour code system that indicates the level of attention the user shall apply.[355] The registry staff processes the revisions, the approval is up to the judicial body.[356] After anonymisation the decision is ready for electronic publication via the Legal Information System.

III. Use of Artificial Intelligence in the registry

Incoming documents are scanned and analysed as well as being extracted metadata like file numbers. Subsequently, categorisation takes place. The software proposes a split-up of bundles of pdf-documents and journalises them automatically in the case management system. The future application of the software envisages an automatic recognition of the concrete kind of proceedings, also where a file number is lacking, automated generation and allocation of file numbers and of the files themselves to the competent judicial body.[357]

IV. Use of Artificial Intelligence while processing of the file

Another timesaving use case is the automated identification of document types and an automated proposal for the title of the document.[358]

351 *Steinbauer*, Anonymisation of court decisions & AI, Presentation at the Federal Ministry of Justice on 02/05/2022.

352 *Steinbauer*, Anonymisation of court decisions & AI, Presentation at the Federal Ministry of Justice on 02/05/2022.

353 *Steinbauer, Anonymisation of court decisions & AI, Presentation at the Federal Ministry of Justice on 02/05/2022.*

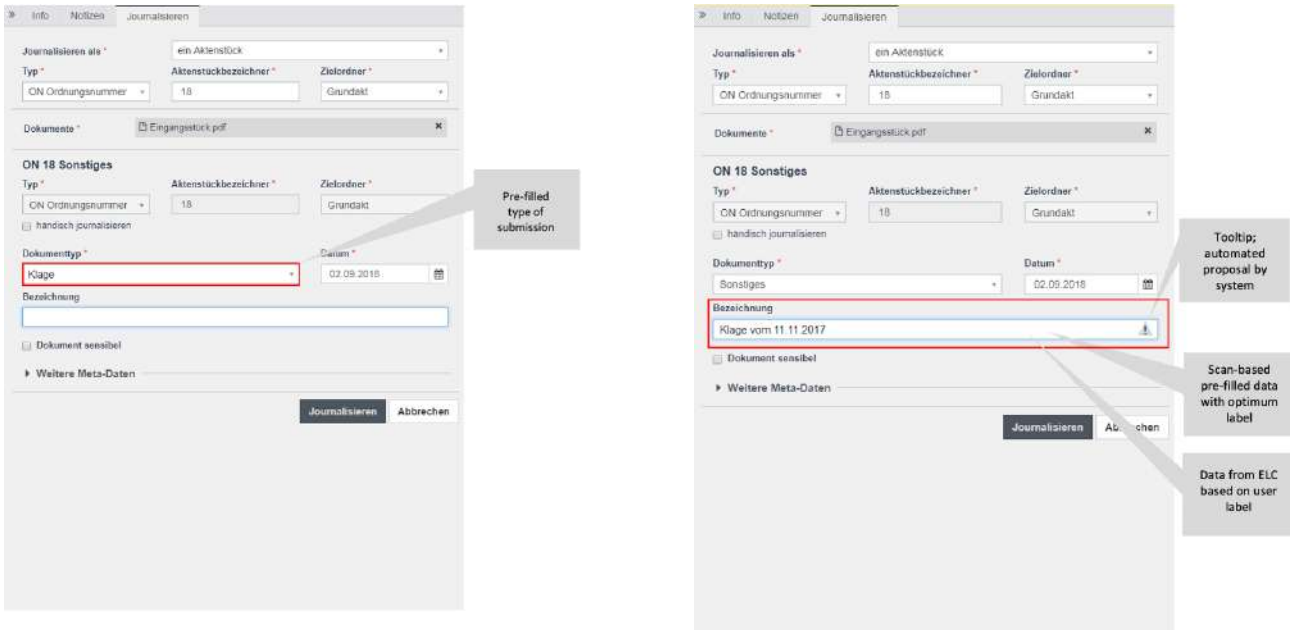
354 *Steinbauer, Anonymisation of court decisions & AI, Presentation at the Federal Ministry of Justice on 02/05/2022.*

355 *Steinbauer, Anonymisation of court decisions & AI, Presentation at the Federal Ministry of Justice on 02/05/2022.*

356 *Steinbauer, Anonymisation of court decisions & AI, Presentation at the Federal Ministry of Justice on 02/05/2022.*

357 *Steinbauer*, Anonymisation of court decisions & AI, Presentation at the Federal Ministry of Justice on 02/05/2022.

358 *Steinbauer, Anonymisation of court decisions & AI, Presentation at the Federal Ministry of Jus-*



The software is also able to support the ex-post digitisation of paper files by creating automated file structure and table of contents.[359] A further add-on is a Link-Button, which automatically links quotations in documents, like judgments or academic articles, to databases and allows the judicial user to get instantly an overview of possible relevant backing for decision-making in a time-saving manner.[360] Future applications areas are the automatic formation of excerpts of relevant content from files and workflow templates.[361]

The same is planned to apply to the investigative stage of proceedings by public prosecutor's offices. The focus lies on the extraction of information and semantic preparation as well as the visualisation of large data sets, like in large proceedings. Future fields of application might include the identification and presentation of (hidden) connections.[362]

tice on 02/05/2022.

359 *Steinbauer*, Anonymisation of court decisions & AI, Presentation at the Federal Ministry of Justice on 02/05/2022.

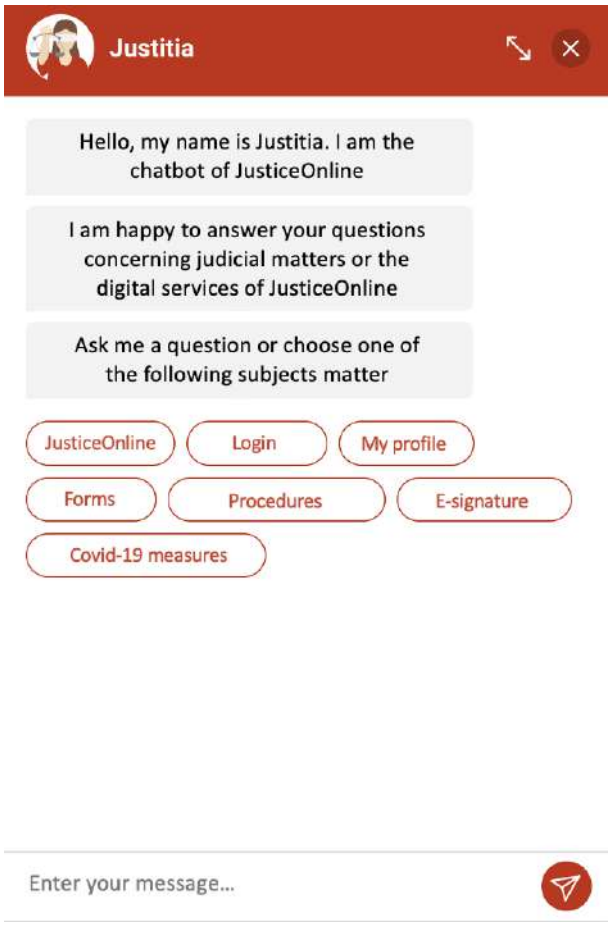
360 *Steinbauer*, Anonymisation of court decisions & AI, Presentation at the Federal Ministry of Justice on 02/05/2022.

361 *Steinbauer,* Anonymisation of court decisions & AI, Presentation at the Federal Ministry of Justice on 02/05/2022.

362 *Steinbauer*, Anonymisation of court decisions & AI, Presentation at the Federal Ministry of Justice on 02/05/2022.

V. Chatbot Justicia

The chatbot called Justicia is implemented in the online platform JusticeOnline, which offers several judicial services to citizens. The chatbot not only answers all kinds of legal questions but also guides the user through different kinds of proceedings. The chatbot is based on Natural Language Understanding (NLU), a special kind of machine learning, for intent recognition in terms of user questions. The Ubitec Bot Framework[363] is built on Docker and supports Kubernetes (OpenShift). This means that no special operating environment is required, and it can easily be operated in any data centre.[364] The Ubitec Bot Framework supports all common NLU solutions, such as Rasa NLU, IBM Watson and Google Dialogflow etc. A change of a NLU including data migration is also supported.[365]



363 The chatbot was designed by Ubitec GmbH.

364 *Ubitec GmbH*, Ubitec Bot Framework; https://ubitec.at/en/bot-framework/ [01/08/2022].

365 *Ubitec GmbH*, Ubitec Bot Framework; https://ubitec.at/en/bot-framework/ [01/08/2022].

D. Estonia

VI. SALME – Speech recognition assistant

Salme is a Machine Learning and NLP [366] tool for speech recognition which is available at Estonian courts.[367] It is connected to the X-Road to process the recording and transcription data. The program can transcribe in real time or offline, which is more time-consuming, but more accurate. Time stamping by the user is possible which allows for adding notes in order to find the related audio recording more easily. According to the Tallinn Circuit Court, they rarely use transcriptions, since the audio recording as well as marking is absolutely sufficient, and it would be too time-consuming to control the transcript.[368]

VII. Guardtime

Guardtime is a tool based on Keyless Signature Infrastructure (KSI) Blockchain that shall control and verify AI-based processes.[369] The objectives of the tool are to ensure that AI-models are not biassed, to enable control and auditability over AI training sets, to verify the input information and other configurations, resilience to attacks, accuracy of the models, quality and integrity of the data, access control, transparency, accountability, compliance, process audit and data/model sharing.[370] Guardtime neither provides AI products or services nor distributed ledger technology policy as they are not provisioning AI products/services themselves.[371]

366 *European Commission*, Study on the use of innovative technologies in the justice field, Final Report (2020), 116; https://op.europa.eu/en/publication-detail/-/publication/4fb8e194-f634-11ea-991b-01aa75ed71a1/language-en# [01/08/2022].

367 *E-Estonia*, Introducing Salme, Estonian courts' speech recognition assistant; https://e-estonia.com/introducing-salme-estonian-courts-speech-recognition-assistant/ [01/08/2022].

368 *Kask*, IT Solutions in Estonian, Visit at Tallinn Circuit Court on 28/04/2022.

369 *European Commission*, Study on the use of innovative technologies in the justice field, Final Report (2020), 116; https://op.europa.eu/en/publication-detail/-/publication/4fb8e194-f634-11ea-991b-01aa75ed71a1/language-en# [01/08/2022].

370 *European Commission*, Study on the use of innovative technologies in the justice field, Final Report (2020), 24; https://op.europa.eu/en/publication-detail/-/publication/4fb8e194-f634-11ea-991b-01aa75ed71a1/language-en# [01/08/2022].

371 *European Commission*, Study on the use of innovative technologies in the justice field, Final Report (2020), 24; https://op.europa.eu/en/publication-detail/-/publication/4fb8e194-f634-11ea-991b-01aa75ed71a1/language-en# [01/08/2022].

VIII. Bürokratt

The latest development is an AI-based platform for the interaction between the state and its citizens. It reunites functions of a classical chatbot, a voice-controlled virtual assistant and a layer-based network of AI applications.[372] It was launched on 18 July 2022.[373] At this point, judiciary-related services do not seem to be included.

4. Comparison and results

The current situation seems to show that there are a series of Artificial Intelligence tools being researched, developed, and implemented. The level of maturity among the different courts and tribunals in terms of AI varies. Interestingly there seems to be an indication of a high appetite to develop AI tools. In Brazil, for example, a significant number of courts and tribunals either have experimented or have already implemented with even a high level of apparent success different AIs.[374] In the EU and its member states there are several applications being developed for the different areas of the government. The Judiciary seems to follow the same trend.

Chatbots and classification tools appear to become more widely used to facilitate both the interaction with the public and the workflow of the judiciary. Applications that support the decision-making process appear in a smaller number yet are growing in importance. The complexities seem to rest in standardisation of judicial data, the sensitivity of the data that could be present and or inferred, not to mention the actual complexities of legal thinking.

There seems to be some caution on the deployment of AI technologies in the different areas as in some cases it may have implications for rights – particularly privacy. One should note, however, the level of accuracy of the AIs deployed are overall high as the level of human oversight as well.

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372 *e-Estonia,* Estonia's new virtual assistant aims to rewrite the way people interact with public services, https://e-estonia.com/estonias-new-virtual-assistant-aims-to-rewrite-the-way-people-interact-with-public-services/ [01/08/2022].

373 *e-Estonia*, Estonian government calls for Europe's developers to join in a ground-breaking project to build next-gen e-government services; https://e-estonia.com/estonian-government-calls-for-europes-developers-to-join-in-a-ground-breaking-project-to-build-next-gen-e-government-services/ [01/08/2022].

374 *Assine,* Robôs já estão presentes na maioria dos tribunais do país | Legislação | Valor; https://valor.globo.com/legislacao/noticia/2022/04/11/robos-ja-estao-presentes-na-maioria-dos-tribunais-do-pais.ghtml. [01/08/2022]. An official tally from CNJ can be found here: https://paineisanalytics.cnj.jus.br/single/?appid=29d710f7-8d8f-47be-8af8-a9152545b771&sheet=b8267e5a-1f1f-41a7-90ff-d7a2f4ed-34ea&lang=pt-BR&opt=ctxmenu,currsel [01/08/2022].

In terms of data availability, standardisation and integration with data management platforms seem significant. They allow for the necessary data to be available for the AIs to be trained with actual practical data. The quality and the selection process appear to be key aspects. The proposal from Brazil to have an AI platform as the mentioned Synapses system may be an example worth exploring for replication, which seems to be the case with Estonian's Bürokratt tool.

Mechanisms for evaluation and monitoring appear to be important. To provide a framework in advance appears to facilitate the development and minimise negative effects.

E. BIG DATA/CLOUD STORAGE/STATISTICS

1. General remarks

The virtualization of the judiciary that began with digitization of documents and digitalisation of processes and embraces the use of artificial intelligence is evolving into integration and connection and cloud storage serves as a potentially significant solution. The gathering of huge volumes of data that previously could not even be quantified, now goes through the complex strategies of big data. The results of using big data strategies with data on the scale available to the Judiciary allows the construction of statistics and analysis models that can inform decisions about judicial public policy and access to justice. All these stages of development and tools of e-Justice, although started at different times, are beginning to converge towards a more cohesive and functional reality.

2. Big data/clouds storage/statistics in general

The need to digitise physical records and archive a multitude of documents,[375] new digital native processes have challenged courts to seek high-impact solutions, which has caused the use of cloud storage to grow exponentially since the introduction of electronic processes in the country. The search for such solutions goes through the analysis of the internal possibilities of each court and presents tensions in terms of security conditions and data storage location.

The arguments in favour of the use of cloud storage also include: the possibility of accessing data and performing acts of the process anywhere, with the economy in terms of physical structures necessary; and the actual acceleration of the processes' dynamics. These advantages, however, materialise and scale with the use of big data strategies. Analysing data is

375 See also *Cloud21*, Transformação digital da Justiça com Cloud Computing; https://cloud21.com.br/seguranca/transformacao-digital-da-justica/ [01/08/2022].

fundamental for the judiciary to be able to determine bottlenecks and improve service delivery. It is in this sense that several AI tools are in operation or being implemented, besides the CNJ produces annually its report "Justice in Numbers", a document that provides an "x-ray" of the Brazilian justice system in the form of numbers and statistics serving to inform the status of the judiciary and the advances carried out.

3. Tools

A. Brazil

I. Statistical Dashboard

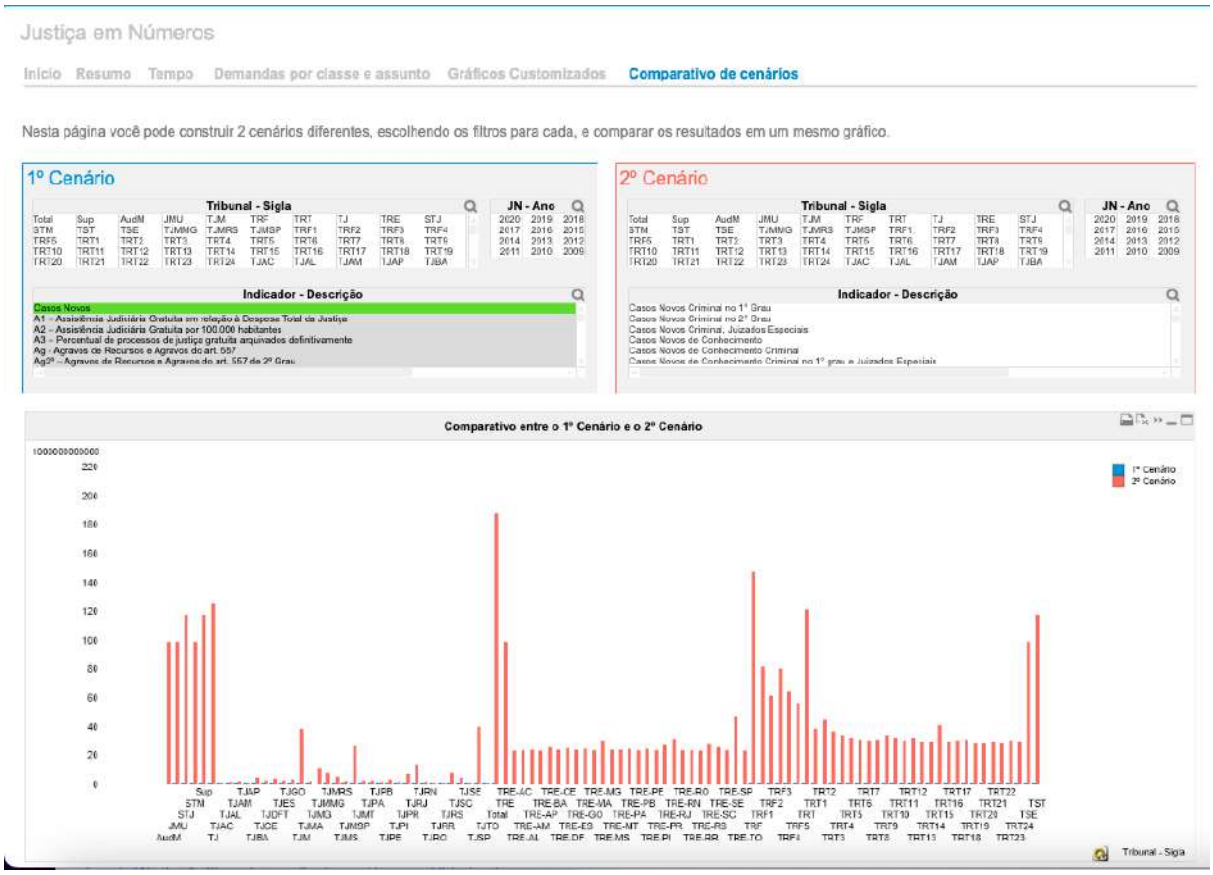
The National Database of the Judiciary ("Datajud") created by Resolution 331/2020 of CNJ, consists of a unified and primary base of procedural data and metadata of the Brazilian judiciary. The data concentrated in Datajud is sent by the courts and, with the use of legal metrics and big data tools, it is possible to produce several reports to monitor the judiciary. It connects to a live dashboard.

The CNJ also has a series of dashboards that provide statistical analysis and jurimetrics that inform "evidence-based" public policies not only for the judiciary itself but for the executive and legislative. Below there is an analysis of how they can contribute to the protection of human rights and the environment.

One should note that data gathered by the judiciary favour the monitoring of several areas of the Brazilian justice system. The CNJ's Dashboards[376] are divided as follows:

a. Justice in Numbers exists since 2004 and is the main source of official statistical data of the judiciary. It contains data such as expenses, human resources, case processing time, and demands per area of law. In addition, it is possible to access customised charts and make several types of comparison.

376 *CNJ*, Panéis CNJ; https://paineis.cnj.jus.br/QvAJAXZfc/opendoc.htm?document=qvw_l%5Cpainelcnj.qvw&host=QVS%40neodimio03&anonymous=true&sheet=shIGLMapa [01/08/2022].



b. Domestic violence: a panel designed to monitor issues related to violence against women. Information is available on the location of the judicial courts that handle cases of this type, as well as new cases, pending trials and finalised cases.
c. Socio-environmental: A panel that presents data related to the policies of environmental sustainability of the judiciary. Here, information such as consumption of electricity, fuel, paper, and telephone are available. In addition, there is data on quality of life at work and waste management.
d. Monthly Productivity Module: a panel that presents, in a simplified way, some data from Justice in Numbers, especially those related to the productivity of the different courts and tribunals in the country. In addition to providing graphics and comparisons, it also has data presentation based on georeferencing. It is an important tool for the use of big data strategies because it allows the evaluation of a series of predictive measures about the issues faced by the judiciary.
e. Repetitive Claims: A panel that presents data related to repetitive claims in progress in the country. Here you can access statistics on the number of suspended cases, repetitive claim incidents filed and decided cases. In addition, it is possible to access the cases by matter. This panel can be related to the use of AI tools that work in the identification of repetitive claims and precedents, demonstrating the level of technological maturity of the Brazilian judiciary regarding the use of statistics, cloud storage, big data, artificial intelligence, and digitisation.

II. Cloud Computing

There have been initiatives from different courts and tribunals to use cloud services in order to achieve many different purposes. There are those that are more basic, such as storing and sharing documents ... as the recent initiative from the Court of Justice of Paraiba that allows members of the court to store pdf and docx files –,[377] to more complex that involve the electronic systems as a whole as the aforementioned proposal from the Court of Justice of Sao Paulo.

It is noteworthy that the PDPJ-Br established by CNJ has in its normative act (Resolution 335/2020, article 4 section V) a definition that it will adopt solutions that necessarily include cloud computing. Article 14 of the same Resolution defines that the PDPJ-Br will be hosted in the cloud and that this service can be provided by private companies, including in the form of cloud integrator (broker). The conditions for such entities to provide the service is that: data storage occurs in a data centre located in Brazil; the company complies with Brazilian law, particularly the data protection law (LGPD); availability, scalability, redundancy and encryption requirements are met; it is possible to measure the use of cloud resources individually by customer for each service provided in the platform; and that it is in accordance with other the standards established by CNJ. This highlights the conditions of the country as there is no all-encompassing public cloud solution nor is there a complete barrier to use private clouds for judicial data. Certain tribunals and courts may choose the path of using or establishing their own public clouds, yet for the platform that is not a complete necessity. In fact, the strategy seems to be to operate under a multi-cloud strategy.[378]

B. European Union

I. European Justice Scoreboard

The European Justice Scoreboard is a statistical online platform providing data on the efficiency, quality and independence of justice systems in the form of reports.[379] Besides these annual EU justice scoreboards, one can find factsheets and surveys (Eurobarometer) as well as some other statistical documents.

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377 *TJPB*, Servidores e magistrados do TJPB já podem armazenar arquivos em 'nuvem oficial' similar ao Google Drive | Tribunal de Justiça da Paraíba; https://www.tjpb.jus.br/noticia/servidores-e-magistrados-do-tjpb-ja-podem-armazenar-arquivos-em-nuvem-oficial-similar-ao [01/08/2022].

378 https://www.youtube.com/watch?v=l9TL3zCzmCk.

379 *European Commission*, European Justice Scoreboard; https://ec.europa.eu/info/policies/justice-and-fundamental-rights/upholding-rule-law/eu-justice-scoreboard_en#assessingnationaljusticesystems [01/08/2022].

II. Excursus: CEPEJ Dynamic database of European judicial systems (CEPEJ-STAT)

The CEPEJ solution pursues a dynamic strategy and presents the users data over well-arranged interactive dashboards (tableau public). This approach facilitates the handling of large data sets. Lacking an automated data connection, the data management involves a lot of resources and effort to keep the database up-to-date.[380]

C. Austria

I. Statistical database and data warehouse

The comprehensive nationwide statistical database is designed as an archive[381] and allows for individual searches according to the needs of the users or statistics for defined user groups based on predefined permissions.[382] The advantage of the underlying data warehouse technology is that it does not affect the operation of applications behind and offers analyses in a more flexible and cost-effective way.[383] The data warehouse is built upon multidimensional data cube structure, which consists of different axes. By this approach, data is clearly structured and can easily be accessed by choice of one or several axes. [384] The benefits of the system are financial and economical savings, the possibility of cross-application evaluations, a corporate design, consistent technology and calculation methods, regular availability, a clear access structure and a protection of data-policy.[385]

II. Statistical Dashboards (Justice 3.0 cockpit)

Before digitalisation of justice, there was no centralised statistical service but an abundance of several platforms and applications for different departments and applications. With the introduction of Justice 3.0, a new solution based on Power BI (at the Federal Ministry of Digital

380 *Council of Europe*, Dynamic database of European judicial systems; https://www.coe.int/en/web/cepej/cepej-stat [01/08/2022].

381 *Horak*, Statistics in Justice, Presentation at the Federal Ministry of Justice on 02/05/2022.

382 *Federal Ministry of Constitution, Reforms, Deregulation and Justice and Federal Ministry of Digital and Economic Affairs*, IT applications in the Austrian justice system (2018) p. 27; https://www.justiz.gv.at/file/2c94848b6ff7074f017493349cf54406.de.0/it-anwendungen%20in%20der%20%C3%B6sterreichischen%20justiz%20stand%20august%202020.pdf?forcedownload=true [01/08/2022]: the raw data can be accessed by a limited user group by means of the Cognos Online access in the Data Warehouse.

383 *Federal Ministry of Constitution, Reforms, Deregulation and Justice and Federal Ministry of Digital and Economic Affairs*, IT applications in the Austrian justice system (2018) p. 27.

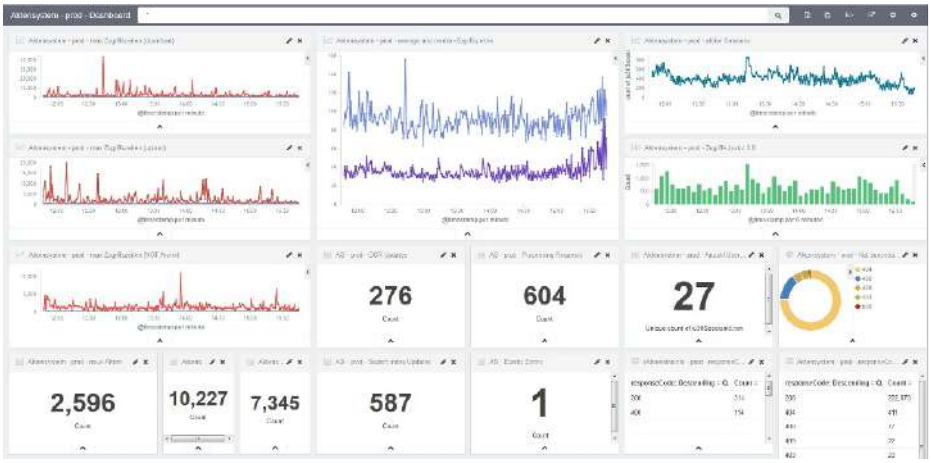
384 *Federal Ministry of Constitution, Reforms, Deregulation and Justice and Federal Ministry of Digital and Economic Affairs*, IT applications in the Austrian justice system (2018) p. 27.

385 *Horak*, Statistics in Justice, Presentation at the Federal Ministry of Justice on 02/05/2022.

and Economic Affairs) has successfully been implemented, which unites all prior applications.[386] Data is regularly recalled from CCMS and centrally stored in the data warehouse and can be accessed for different purposes like workload statistics, staff-related statistics, procedural statistics, ad-hoc analyses.[387] At the moment, it is only available for authorised users within the judiciary by means of intranet.[388]

II. Kibana

For reasons of surveillance of the digital environment of the Austrian judiciary, the KIBANA system provides several key performance indicators.[389]



386 *Horak*, Business Intelligence in Justice – Or the Way to bring Statistics to a Judge (2022) p.8.

387 Federal Ministry of Constitution, Reforms, Deregulation and Justice and Federal Ministry of Digital and Economic Affairs, IT applications in the Austrian justice system (2018) p. 27.

388 Federal Ministry of Constitution, Reforms, Deregulation and Justice and Federal Ministry of Digital and Economic Affairs, IT applications in the Austrian justice system (2018) p. 27.

389 *Hackl*, Justice 3.0 Architecture (2019) p. 42.

IV. The Justice Cloud

The Federal Ministry of Justice agreed with the Federal Computing Centre on the implementation of a Justice Cloud on the basis of the Government Cloud, as a platform-as-a-service concept on top of red hat open shift technology.[390] The Federal Computing Centre is right now in the process of transformation from a server-based to a cloud-based system in order to meet future scalability requirements and flexibility.[391] It is not only money- but also time-saving. [392]

D. Estonia

I. The Government Cloud

The Estonian digital environment relies on a two-sites based governmental cloud system, which also comprises the application of the judiciary.[393] It was developed in the framework of a Public-Private-Partnership solution.[394] For less sensible data Estonia also uses private cloud solutions.[395]

II. KSI Blockchain technology

After a major cyber-attack in 2007 on different public and private entities Estonia was rethinking its cybersecurity structure.[396] Subsequently, Estonia implemented blockchain technology as the first country on a national level.[397] Blockchain technology is like a layer between different services.[398] Changes made to the databases or registries can be tracked as well as the person responsible for the intervention, which ensures the authenticity of the data. [399] Also, the Digital Court System is backed by blockchain technology.[400]

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390 *Hackl,* Presentation at the Federal Ministry of Justice on 02/05/2022.

391 *Hackl,* Presentation at the Federal Ministry of Justice on 02/05/2022.

392 *Hackl*, Presentation at the Federal Ministry of Justice on 02/05/2022.

393 *e-Estonia*, Factsheet Government Cloud; https://e-estonia.com/solutions/e-governance/government-cloud/ [01/08/2022].

394 State Infocommunication Foundation (RIKS), Cybernetica, Dell EMC, Ericsson, OpenNode and Telia; e-Estonia, Factsheet Government Cloud; https://e-estonia.com/solutions/e-governance/government-cloud/ [01/08/2022].

395 *Raal*, Presentation at e-Estonia on 28/04/2022 [01/08/2022].

396 *Raal*, Presentation at e-Estonia on 28/04/2022 [01/08/2022].

397 *Raal*, Presentation at e-Estonia on 28/04/2022 [01/08/2022].

398 *Raal*, Presentation at e-Estonia on 28/04/2022 [01/08/2022].

399 *Raal*, Presentation at e-Estonia on 28/04/2022 [01/08/2022].

400 *e-Estonia*, KSI blockchain in Estonia; https://e-estonia.com/wp-content/uploads/2019sept_faq-ksi-blockchain-1-1.pdf [01/08/2022].

III. Data Embassy

Estonia relies on another way to mitigate cyber-attacks by entertaining a data embassy in Luxembourg, which backs up strategically important datasets of the Estonian digital systems in a Tier 11 and Tier IV certified data centre.[401] The agreement between Luxembourg and Estonia – there is also one between Luxembourg and Monaco – is a new kind of international agreement sui generis, which also guarantees immunity due to the reference to the 1961 Vienna Convention on Diplomatic Relations.[402]

4. Comparison and results

In terms of the use of cloud services, the solutions that this technology provides are being embraced by the different countries.[403] It seems to satisfy the needs of dealing with a high volume of data and easy access from multiple points of entry. The pandemic seems to also have pushed the implementation of solutions of this type, as it may be seen by the increase in projects in the last two years.

One important difference to note is the use of public versus private clouds. Member countries of the EU seem to be focused on developing their own clouds or using public networks. There appears to be a concern with stability of access and retrievability of data, lock-in, not to mention security and resilience of the services.

In view of the sheer size, volume of data and complexity of the structure in Brazil the strategy has been one having a more liberal approach which seems to allow for the possibility of using private clouds or private serviced or administered clouds. It is significant that the concerns seemed to be similar as there are several conditions present in order for a cloud service to be contracted.

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401 *Raa*l, Presentation at e-Estonia on 28/04/2022; e-Estonia, Factsheet Data Embassy, https://e-estonia.com/wp-content/uploads/2020mar-facts-a4-data-embassy.pdf; The Government of the Grand Duchy of Luxembourg, E-embassies in Luxembourg, https://luxembourg.public.lu/en/invest/innovation/e-embassies-in-luxembourg.html; also cp. OECD, The world's first data embassy– Estonia; https://www.oecd.org/gov/innovative-government/Estonia-case-study-UAE-report-2018.pdf [01/08/2022].

402 The Government of the Grand Duchy of Luxembourg, E-embassies in Luxembourg, https://luxembourg.public.lu/en/invest/innovation/e-embassies-in-luxembourg.html [01/08/2022].

403 *Raal*, Presentation at e-Estonia on 28/04/2022.

F. PRISON AND CRIMINAL MATTERS (BIOMETRICS)

1. General remarks

Several of the most important challenges facing justice systems refer to criminal matters and the prison population. It is no wonder that the transformation in e-Justice includes this field as well. The tools developed, however, have a difficult task to balance, the needs of security and the imperatives of protecting fundamental and human rights.

E-Justice in this area tends to focus four main aspects: (i) tools that facilitate investigation; (ii) systems and services that collaborate with the efficiency of proceedings; (iii) technologies that support the execution of sentences; and (iv) mechanisms for monitoring the status of individuals impacted by the criminal justice system (and evaluate the system itself).

As several of the tools noted above may play a role in criminal proceedings, this section shall concentrate on specificities and particular tools that have been developed for or are used in this particular field.

2. Prison and Criminal Matters (biometrics) in general

A. Brazil

The most recent data on the size of the prison population in Brazil point to approximately six hundred and seventy thousand people incarcerated and about one hundred and forty thousand under house arrest, reaching a total of more than eight hundred thousand individuals.[404] Weighing on that, there is a significant deficit of vacancies combined with the often-precarious conditions of prisons. This reality not rarely produces a dramatic situation, which tends to impact the principles of criminal procedure directly and indirectly, not to mention human rights. The challenge, however, is not new and over the decades several initiatives have been tested with varying results. The use of advanced technology in several of these stages is, however, more recent and presents a fresh perspective for the Brazilian criminal justice system.

404 https://www.gov.br/depen/pt-br/assuntos/noticias/segundo-levantamento-do-depen-as-vagas-no-sistema-penitenciario-aumentaram-7-4-enquanto-a-populacao-prisional-permaneceu-estavel-sem-aumento-significativo#:~:text=Bras%C3%ADlia%2C%2020%2F12%2F2021,em%20dezembro%202020%2C%20para%20820.689 [01/08/2022].

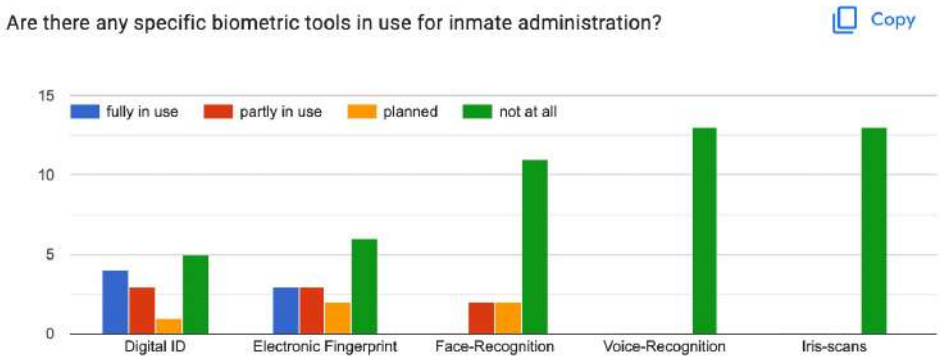
In Brazil, criminal and penitentiary issues tend to face structural challenges thus, the use of technology to have a social impact as well as instrumental should be throughout the entire cycle, from investigation to procedural, culminating in the execution of the sentence.

In terms of penitentiary matters, until recently, data on the prison system and the incidence of crime was not widely available and tended to have poor quality and/or was not structured rendering it difficult to use in large scale analysis.

This reality is changing as a result of e-Justice tools being more widely used and available. Several projects aim at supporting such change. One important thing is the partnership between CNJ, UNDP and the Ministry of Justice and Public Security (MJPS), "Doing Justice" ("*Fazendo Justiça*").[405] The Programme intends to use innovative approaches and solutions in order to facilitate Brazilian courts' compliance with the principle of protecting the rights of prisoners and promoting an efficient justice system, and support fair law enforcement reducing delays and providing a more efficient management of the criminal justice system. Hence, several initiatives and projects focus on e-Justice as a significant effort of access to justice, human rights' protection, and overall efficiency of the judiciary, particularly of the criminal and penitentiary systems.

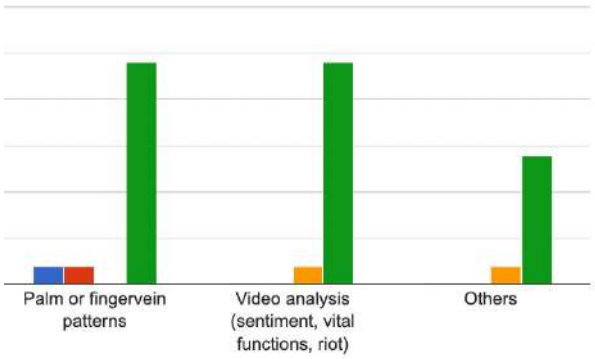
B. EU and its member states

Lacking the competence of the EU in penitentiary matters, aside from general voluntary initiatives,[406] the field it mainly up to the member states. As the survey disclosed, biometrics in the penitentiary systems, apart from general digital tools like digital ID and electronic fingerprints, are quite rarely used. This may be ascribed to their intense character.



405 *CNJ*, Fazendo Justiça; https://www.cnj.jus.br/sistema-carcerario/fazendo-justica/ [01/08/2022].

406 Europris, https://www.europris.org/ [01/08/2022].



With regard to the relatively low data availability in the EU member states, the comparison will mainly reflect to the situation in Austria's penitentiary system. Estonia's (general) automated biometric identification system database (ABIS) may also be pointed out and could be of interest of future research[407]

3. Tools

A. Brazil

There are many different initiatives in terms of e-Justice for penitentiary and criminal matters. To better understand them, they are presented following the aforementioned four main aspects of analysis: investigation, proceedings, execution of sentences and monitoring.

I. Investigations

In Brazil, the investigation phase of crimes is the responsibility of the civil police, and the prosecution is carried out by the Prosecution Services, neither institution being part of the Judiciary *per se,* yet supporting the Justice System as a whole. At this stage evidence of an alleged crime may be gathered, in part with the oversight and through judicial orders issued by judges. One significant aspect of discussion deals with biometric data collected at this stage, an important discussion deals with storing and processing genetic information.

407 Estonian Ministry of Interior, Automated biometric identification system database – ABIS; https://www.siseministeerium.ee/en/activities/tohus-rahvastikuhaldus/abis [01/08/2022].

01. National Bank of Genetic Profiles

The processing of genetic data, especially DNA, for criminal matters is relatively recent and not widely used in Brazil. There is both an opportunity and a risk in using DNA evidence particularly in creating DNA databases. On the one hand, considering the low rates of solving crimes, the use of DNA may have a purpose. The National Bank of Genetic Profiles[408] holds the records of thousands of genetic profiles of convicts and may allow the cross-referencing of information for a more precise resolution of crimes. On the other hand, it may also create a risk in manipulating such data in view of the sensitive nature of the actual data. One important note is that the data in the bank may also be made available for law enforcement and public security agencies.

II. Proceedings

Criminal proceedings begin legally at the moment a judge accepts the accusation presented by the Prosecution Services. During this phase, according to the rules of criminal law and criminal procedure, the individual will be able to defend herself against the accusations and, in the end, will be either convicted or acquitted. The guarantees and safeguards present in the Constitution, the international treaties ratified by the country and the law may be supported by sound and responsible use of technology.

01. Virtual hearings

Virtual criminal hearings, whether at the trial or execution stage, became a recurring practice during the pandemic. The complexity here refers to the guarantee of appearing before a judge. The STJ has, however, ruled that this practice does not impair the defence of one accused[409]. This type of hearing allowed the provision of criminal jurisdiction to be guaranteed during the pandemic and, even with difficulties, especially with regard to the instruction of witnesses, it proved effective[410]. In the case of defendants who are in prison or serving their

408 *Portal do Governo Brasileiro*, Banco Nacional de Perfis Genéticos: uma ferramenta eficiente para elucidação de crimes https://www.justica.gov.br/news/collective-nitf-content-1556212211.45 [01/08/2022].

409 *STJ,* Realização de audiência por vídeo durante a pandemia não configura cerceamento de defesa; https://www.stj.jus.br/sites/portalp/Paginas/Comunicacao/Noticias/05102020-Realizacao-de-audiencia-por-video-durante-a-pandemia-nao-configura-cerceamento-de-defesa.aspx [01/08/2022].

410 *FREITAS*, Isa Omena Machado de; *BRASIL*, Tatila Carvalho. As audiências criminais por videoconferência, nas fases de instrução e julgamento e pronuncia do acusado considerando o princípio da celeridade processual e as vantagens para o advogado, promotor de justiça e estado durante o processo penal. 2021. Available at: https://jus.com.br/artigos/94512/as-audiencias-criminais-por-videoconferencia-nas-fases-de-instrucao-e-julgamento-e-pronuncia-do-acusado-considerando-o-principio-da-celeridade-processual-e-as-vantagens-para-o-advogado-promotor-de-justica-e-estado-durante-o-proces-

sentences, the measure allows for a reduction in expenses with escorts and risks with the displacement of convicts.

02. Statute of Limitation Calculator

It is an online calculator made available by the CNJ[411] that allows anyone to calculate whether a certain criminal claim would run into the statute of limitation or not. As the length of period of the statute of limitation in Brazil is calculated taking into consideration the offence being secured and the sentence that may be imposed, the period may vary and can be difficult to calculate. As there is a vast workload and the average of a lawsuit (including criminal lawsuits may be high), several cases may be in the system being processed that would have as a result a declaration the statute of limitation bars criminal punishment. This tool (calculator) allows anyone to check whether the right to punish an individual is still there, taking into account this fact the statute of limitations related to the offence committed may be in place. The goal is not only the protection of one's rights and guarantees in terms of fair trial and due process, but also a more efficient use of public resources that do not continue a lawsuit that has no basis anymore.

03. Legal mailbox ("malote digital")

The legal mailbox ("*malote digital*"[412]) was developed by the CNJ to allow the exchange of official documents between different organs of the judiciary.[413] This solution, although apparently simple, has as one of its main virtues the increase of speed in the exchange of official information, something especially important in the case of release warrants, for example. The Court of Justice of Paraíba, for instance, is implementing the use of this tool ("digital mailbox") for communication between the judiciary and the prisons within the state.[414]

III. Execution

Sentencing in criminal cases tends not necessarily to include time in prison, or may not be restricted to it. Certain technologies permit to diminish the necessity and the length

so-penal [01/08/2022].

411 *Artigos*, Prescrição; https://www.direitonet.com.br/artigos/exibir/1585/Prescricao#:~:text=Na%20%C3%A1rea%20penal%20a%20prescri%C3%A7%C3%A3o,com%20o%20decurso%20do%20tempo [01/08/2022].

412 "*Malote*" is a reference to the way in the past physical documents and files were exchanged in bags or pouches.

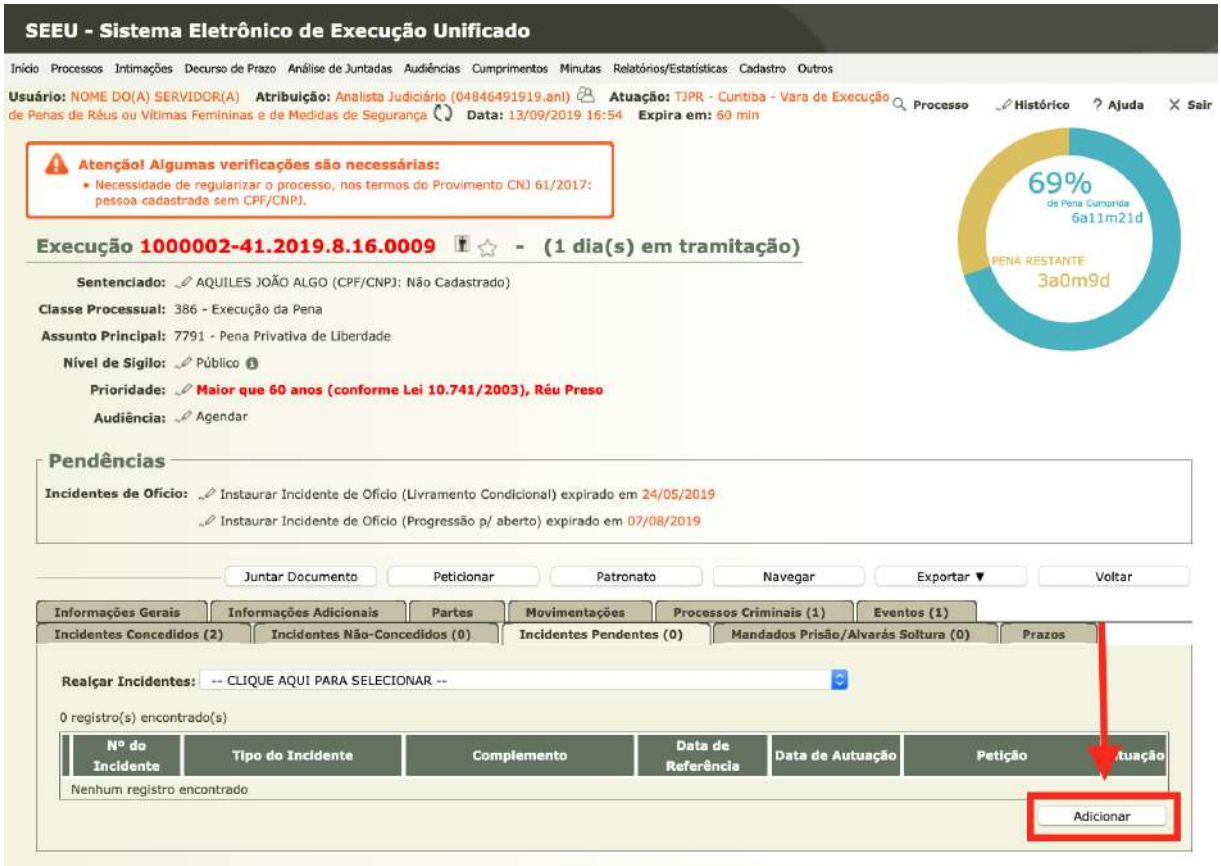
413 *CNJ*; https://atos.cnj.jus.br/atos/detalhar/158 [01/08/2022].

414 *TJPB*, Implantação do Malote Digital para comunicação entre o Judiciário e os presídios é debatida no TJPB; https://www.tjpb.jus.br/noticia/implantacao-do-malote-digital-para-comunicacao-entre-o-judiciario-e-os-presidios-e-debatida [01/08/2022].

of incarceration, one of those is ankle bracelets and other forms of remote monitoring. Yet, probably the most important changes tend to come from better managing penitentiary and inmate data, they have led to less time in prison – as individuals can be better aware of the time served – and better conditions.

01. Unified Electronic Execution System - "SEEU"

In 2016, CNJ put in place the Unified Electronic Execution System (SEEU), a tool for standardising and managing criminal execution processes in the country. The high workload at criminal execution courts and the changes in systems and record keeping mechanisms in the different institutions responsible meant that accounting for the completion of sentences was complex and not uniform. The SEEU solves many of the problems as it automatically calculates the length of the sentence together with the different benefits that may help reduce it and has an inbuilt automatic alert that indicates when an individual is up for progression or his or her sentence has come to an end. The tool not only serves judges but other participants in the criminal procedure (prosecutors, lawyers, public defenders, prison managers, among others) making available in real time the necessary data presented in different formats for easy user experience. Access may happen through a computer or a cell phone[415].



415 *CNJ*, Sistema Eletrônico de Execução Unificado (SEEU); https://www.cnj.jus.br/sistema-carcerario/sistema-eletronico-de-execucao-unificado-seeu/ [01/08/2022].

02. Biometrics

The CNJ estimates that 80% of the prison population in Brazil does not have official identification documents in their records.[416] Biometric technology is being used in prisons to ensure identification. This is not only a matter of record keeping, but it does also have an effect in terms of access to public services inmates are entitled to. In addition, biometrics can work as a way to limit judicial errors, as the identification of the convict allows a verification on whether he or she actually corresponds to the author of the crime.

03. Facial Recognition

Facial recognition technologies are being tested for different purposes in the country and face significant opposition particularly from civil society that questions its accuracy and whether it does not adversely impact certain groups, chiefly the black population.[417] Despite that, the technologies have become increasingly integrated in many tools and services in the country, from proof of life for access to social security benefits, to accessing buildings and registering presence in schools.

In the Criminal Justice System, one example is the Court of Justice of the state of Amazonas has implemented the use of facial recognition for entering the courts. This is part of a new Prison Management System ("*Sistema de Gestão Prisional*", "Sigesp") that aims to monitor the entire cycle of a citizen in the prison system. The idea is that this mechanism will help keep track of attendance of convicts who are serving their sentences in different penitentiary regimes and allow the automatic issue of the inmate's prison certificate[418] – a procedure that currently takes weeks. Besides these features, the idea is that Sigesp will work as a database and can be integrated into the prison security system with the use of facial biometrics to identify the incarcerated population[419].

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416 *TSE*, TSE e CNJ realizam primeira ação para identificar pessoas sem documento nas prisões https://www.tse.jus.br/imprensa/noticias-tse/2021/Outubro/tse-e-cnj-realizam-primeira-acao-para-identificar-pessoas-sem-documento-nas-prisoes [01/08/2022].

417 As an illustration the recent study from the project O Panoptico serves as an illustration. O Panóptico, A RIO OF CAMERAS WITH SELECTIVE EYES: THE USE OF FACIAL RECOGNITION BY THE RIO DE JANEIRO STATE POLICE; https://opanoptico.com.br/wp-content/uploads/2022/05/PANOPT_riodecameras_mar22_0404b_english.pdf [01/08/2022]..

418 It is a declaration that contains information about the imprisoned person and the completion of their sentence. Signed by the responsible authority for enforcing the sentence, it is used, for example, to obtain reclusion aid. Governo do estado Mato Grosso do Sul, ATESTADO DE PERMANÊNCIA CARCERÁRIA OU DECLARAÇÃO DE CÁRCERE; https://www.agepen.ms.gov.br/informacoes-a-familiares-e-visitantes-4/atestado-de-permanencia-carceraria/#:~:text=ATESTADO%20DE%20PERMAN%C3%8ANCIA%20CARCER%C3%81RIA%20OU%20DECLARA%C3%87%C3%83O%20DE%20C%C3%81RCERE,-O%20QUE%20%C3%89&text=A%20declara%C3%A7%C3%A3o%20de%20c%C3%A1rcere%2C%20ou,preso%2C%20naquele%20local%20e%20data [01/08/2022].

419 *Revista Cenarium*, TJAM inaugura segurança por reconhecimento facial; tecnologia será usada

IV. Monitoring

As most of the prison system and crimes are under the competence of the state courts, it has been challenging to integrate data from so many different sources. Thus, development of public policy for the criminal justice system and particularly the penitentiary system has been complex and lacking in precise quality data. However, as of late, CNJ has been investing in different fronts in order to establish a precise and holistic monitoring system.

01. National Prison Monitoring Bank 2.0 - "BNMP 2.0"

BNMP 2.0 is a second version of an electronic national system for managing documents related to arrest and release orders. The data managed by this system form the National Registry of Prisoners. The monitors the registration of individuals in conjunction with the necessary documents (arrest warrants, release warrants, internment warrants, collection, and internment guides, among others). This allows for identification of all persons wanted or in custody, in the various categories of arrest – civil or criminal – and whether they are in provisional detention, complying with security measures, or definite incarceration[420].

02. "Geopresídios"

Geopresídios is a platform that gathers data from monthly inspections conducted in all prisons in the country and aggregates them at the National Registry of Inspection in Penal Establishments ("CNIEP"). The tool presents an "x-ray" of Brazilian prisons in the form of statistical graphs and maps with data on vacancies, physical structure, inmates' sentence regime, among others[421].

em presídios; https://revistacenarium.com.br/tjam-inaugura-seguranca-por-reconhecimento-facial-tecnologia-sera-usada-em-presidios/ [01/08/2022].

420 *CNJ*, BNMP 2.0; https://www.cnj.jus.br/sistema-carcerario/bnmp-2-0/ [01/08/2022].

421 See also *CNJ,* DADOS DAS INPEÇÕES NOS ESTABELECIMENTOS PENAIS; https://www.cnj.jus.br/inspecao_penal/mapa.php [01/08/2022].

B. Austria

1. General remarks

Pursuant to Art. 10 § 1 (6), the prison regime in Austria falls into the competence of the federation,[422] in fact, the Ministry of Justice is responsible for its administration.[423] Since its administration is quite complex and there are at stake strong security reasons, more intense interventions, also in terms of digital technologies, may be justified than in other legal areas. However, digital solutions can also contribute to a less intense surveillance compared to conventional measures, since they may react, in many cases, only event related. Furthermore, digital tools can contribute to the protection of the inmates in case of treats of other inmates or self-endangerment, like suicides. Effective protection may also be discussed under "positive obligation doctrine" of the European Court of Human Rights.

Basically, the applications developed for the Austrian penitentiary system, can be subsumed under the following categories:[424]

422 "Institutions for the protection of society against criminal or dangerous persons" Original term: "Einrichtungen zum Schutz der Gesellschaft gegen verbrecherische oder sonstige gefährliche Personen".

423 Federal Ministries Act 1986; Original term: "Bundesministeriengesetz 1986 – BMG"; https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=10000873 [01/08/2022].

424 *Ungersböck*, "COCKPIT" Visualization of KPI's of the Austrian penal system (2021).

I. Integrated Prison Administration (IVV) and Electronic Enforcement Management

The IVV system concerns the whole prison administration and comprises enforcement, the inmates' records as well as calculation of detention time left.[425] In the course of the Justice 3.0 project, the administration became more and more digitised by means of the follow-up application Electronic Enforce Management.[426] Several modules have already been realised: the electronic surveillance of inmates, the complaint register, social services or classification (of roles and detention).[427] The system is also connected to ELC for communication with courts. The fully electronic file for inmates is currently under development. It will include large sets of data since it unites all personal and procedural data of the inmate as well as medical data, complaints, etc.[428]

425 *Federal Ministry of Constitution, Reforms, Deregulation and Justice and Federal Ministry of Digital and Economic Affairs*, IT-Anwendungen in der österreichischen Justiz (2020) p. 8; https://www.justiz.gv.at/file/2c94848b6ff7074f017493349cf54406.de.0/it-anwendungen%20in%20der%20%C3%B6sterreichischen%20justiz%20stand%20august%202020.pdf?forcedownload=true; [01/08/2022].

426 *Federal Ministry of Constitution, Reforms, Deregulation and Justice and Federal Ministry of Digital and Economic Affairs*, IT-Anwendungen in der österreichischen Justiz (2020) p. 8; [01/08/2022].

427 *Federal Ministry of Constitution, Reforms, Deregulation and Justice and Federal Ministry of Digital and Economic Affairs*, IT-Anwendungen in der österreichischen Justiz (2020) p. 8; [01/08/2022].

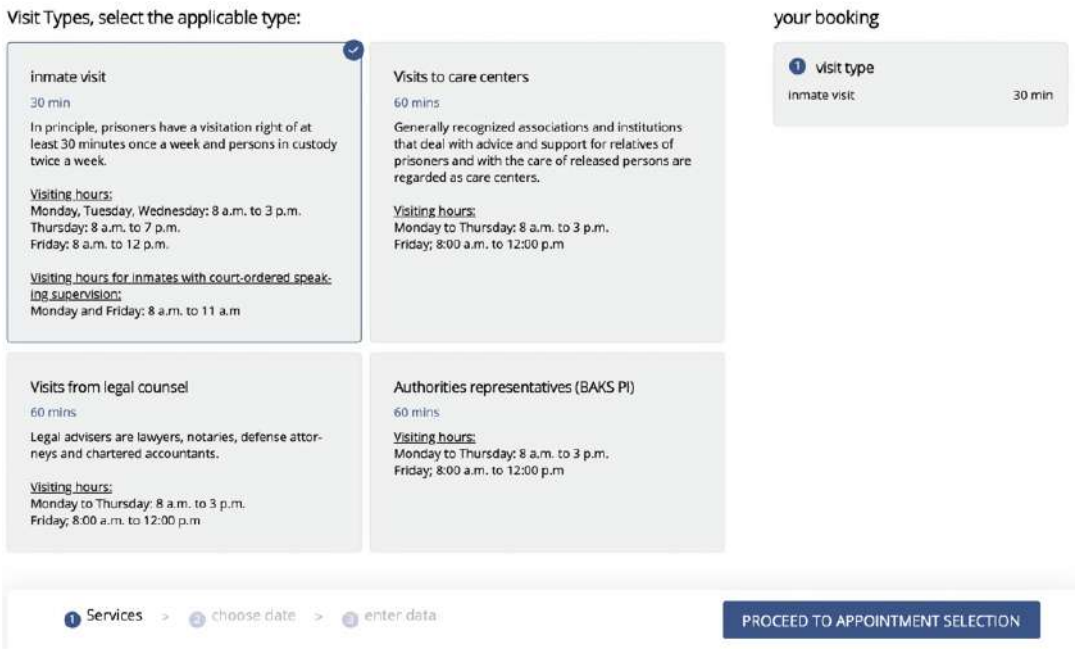
428 Information of the Federal Ministry of Justice of 09/04/2022.

II. Integrated business management

This module was developed for the support of the prison enterprises. It not only includes accounting and warehouse management but also healthcare as well as security issues like administration of arms, keys, and locks.[429]

III. e-Appointment

The e-Appointment online platform makes available different services and facilitates inmate visits or appointments with legal counsels, authorities, or probation service.[430]



429 *Information of the Federal Ministry of Justice of 09/04/2022.*

430 *Federal Ministry of Justice*, https://etermin.justiz.gv.at/jalinzbesuch [01/08/2022].

IV. Biometrics and AI

01. KIIS

The Federal Ministry of Justice also initiated a project on the analysis of video recording and movement data for the improvement of security in prisons[431] with different partners including Artificial Intelligence solutions.[432] It focuses on automated recognition of abnormal behaviour, also known as riot-control solutions.[433] Its objective is to support and protect the enforcement staff as well as the inmates by means of Artificial Intelligence[434] The project is based on a multifaceted approach and experiences of Privacy Preserving Machine Learning, which results in the use of anonymised or pseudonymised[435] sensor technologies (Wearables, 3D and thermal sensors) and the fusion of several data sources.[436] The system is open to other technologies and allows for extensions (audio capture, IoT-devices, RGB cameras and facial recognition algorithms in case of emergencies).[437] The system will not only be able to detect emergencies, but also relies on the analysis of (more subtle) nonverbal and physical interactions.[438] It will also assess long-term patterns in order to spot aggressive behaviour.[439] The study will entail risk and legal assessment in order to exclude human rights violations.[440] The study highlights the importance of human rights protection and a careful approach taking into account the protection of the inmates' privacy.

02. DIGDOK

Started in September 2021, the DIGDOK project targets on the analysis and documentation of safety-relevant routine activities in prisons and the possible technical solutions.[441] Existing solutions will be included in a digitalisation roadmap focusing on the illustration of possible

431 Information of the Federal Ministry of Justice of 09/04/2022.

432 Information of the Federal Ministry of Justice of 09/04/2022.

433 Information of the Federal Ministry of Justice of 09/04/2022.

434 KIRAS Sicherheitsforschung, Künstliche Intelligenz im Strafvollzug; https://www.kiras.at/gefoerderte-projekte/detail/kiis-kuenstliche-intelligenz-im-strafvollzug [01/08/2022].

435 According to the privacy by design approach..

436 *KIRAS Sicherheitsforschung*, Künstliche Intelligenz im Strafvollzug; https://www.kiras.at/gefoerderte-projekte/detail/kiis-kuenstliche-intelligenz-im-strafvollzug [01/08/2022].

437 *KIRAS Sicherheitsforschung*, Künstliche Intelligenz im Strafvollzug; https://www.kiras.at/gefoerderte-projekte/detail/kiis-kuenstliche-intelligenz-im-strafvollzug [01/08/2022]. Information of the Federal Ministry of Justice of 09/04/2022.

438 *KIRAS Sicherheitsforschung*, Künstliche Intelligenz im Strafvollzug; https://www.kiras.at/gefoerderte-projekte/detail/kiis-kuenstliche-intelligenz-im-strafvollzug [01/08/2022].

439 *KIRAS Sicherheitsforschung*, Künstliche Intelligenz im Strafvollzug; https://www.kiras.at/gefoerderte-projekte/detail/kiis-kuenstliche-intelligenz-im-strafvollzug [01/08/2022].

440 *KIRAS Sicherheitsforschung*, Künstliche Intelligenz im Strafvollzug; https://www.kiras.at/gefoerderte-projekte/detail/kiis kuenstliche-intelligenz-im-strafvollzug [01/08/2022].

441 *Vicesse*, DIGDOK; https://www.vicesse.eu/digdok [01/08/2022].

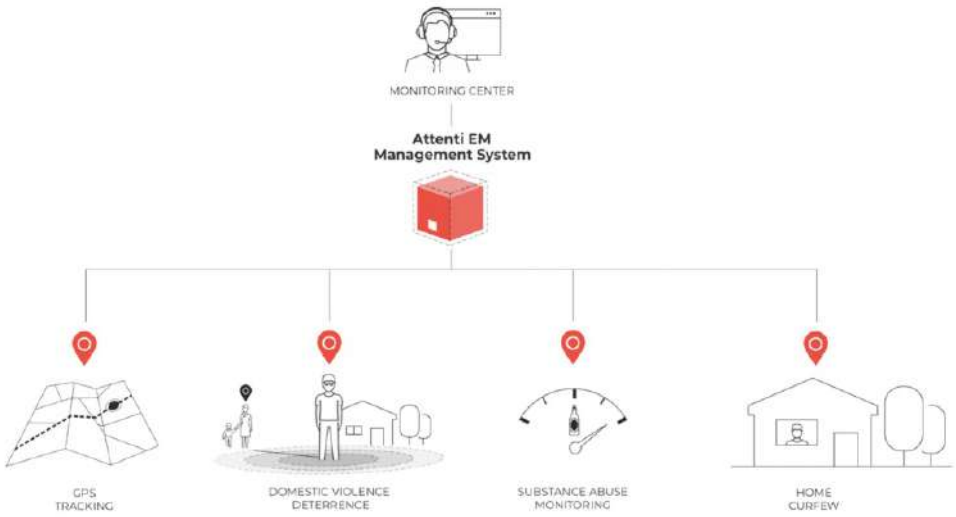
technologies (AI, virtual and augmented realities) and mobile devices (wearables, smartphones, tablets, IoT devices).[442]

03. SAVD Video Interpretation and Telehealth Solution

The system[443] provides a platform to connect medical doctors, psychologists, or medical staff with inmates for remote health control and communication.[444] The implemented video interpretation solution helps to overcome language barriers. It can also be connected with telemedical devices, like special telemonitors for vital parameter recording or defibrillators as well as remote ultrasound scanners.[445]

04. Electronic Tags and related solutions

These devices are used for imprisonment by means of house arrest. As shown in the table below, the system is used for GPS tracking, domestic violence deterrence, substance abuse monitoring and home curfew.[446] Data is exchanged between prisons, probation service and electronic surveillance centres, for example the movement profiles related to allowed appointments of the surveilled person. [447]



442 *Vicesse*, DIGDOK; https://www.vicesse.eu/digdok [01/08/2022].

443 *SAVD*, Videodolmetschen; https://www.savd.at/ [01/08/2022].

444 Cisco Jabber and Cisco Finesse.

445 Devices like Tempus LS Defibrillator, Tempus Pro Monitor or Philips IntelliVue MX100 Patient monitor or Lumify Mobile Ultrasound.

446 *Attenti*, Electronic monitoring innovation, for a safer society https://www.attentigroup.com/intl/ [01/08/2022].

447 Information of the Federal Ministry of Justice of 18/04/2022.

05. Further solutions

There is at least one prison in Austria that uses palm vein scans for furlough.[448] The scan automatically opens the inmate file for human administered identification at the security gate.[449] Cameras with on-board AI which are able to check incoming cars or suspicious people in the vicinity of prisons.

4. Comparison and results

The research disclosed that, apart from the relatively widespread use of electronic ID and fingerprint systems, the implementation of biometrics in the penitentiary system is still in its infancy.

More complex digital tools (also in the combination with AI) are tested in several pilots or research projects. The reticence may have its origin in the invasive character which not only requires broad expertise regarding the implementation of technical but also legal safeguards, which is extremely important to prevent inmates being used for testing purposes. Voluntary inclusion of inmates or legal remedies respectively shall be the basis in any case. Anyway, the implementation of digital tools can also improve the situation of the inmates (security, prison conditions, education and reintegration, prevention of arbitrary behaviour of prison staff).

Overall, the administration of prisons is about to rely more and more on digital tools, which can compensate for the disadvantages resulting from the restricted freedom of movement of inmates (like telehealth solutions or remote interrogations).

G. ENVIRONMENTAL MATTERS

1. General remarks

Concerns with the environment have been growing worldwide and, in the EU, its member states and Brazil have been working towards facing challenges in terms of sustainability and preserving the environment. Despite political complexities, there are several important initiatives being brought to the light. Information and communication technologies may not yet alone directly respond to the environmental challenges the globe faces. Yet, three main areas appear to benefit exponentially from the support of ICTs and digital technologies in general: (i) statistical analysis; (ii) monitoring; and (iii) evidence-based decision making.

448 Information of the Federal Ministry of Justice of 18/04/2022. Due to security reasons, the information cannot be specified.

449 Information of the Federal Ministry of Justice of 18/04/2022. Due to security reasons, the information cannot be specified.

One the one hand, the digitisation of documents and processes play a part in mitigating the impact the judicial and bureaucratic activity itself has on the environment. On the other hand, collecting and processing environmental data, cross-referencing and/or enriching with other databases (judicial included) can provide important insights on the status of environmental policies and may suggest avenues of action.

The Judiciary, thus, can play a role in safeguarding the environment and promoting sustainability. This may happen in partnership with other public institutions, civil society or even the private sector. In this section, the study explores such initiatives and aims to showcase their potential.

2. Environmental matters

A. Brazil

The protection of the environment in Brazil is shared by several bodies. The environmental police, public entities, and NGOs, in addition to the Prosecution Services, which has a significant role in safeguarding that the environmental rules are upheld and do not impact individual and collective rights. The judiciary has to deal with several challenges that steem not only from the size of the country, but also from the complexity of regulatory space as coordination with several actors and on several levels (municipal, state and federal) is not always straightforward. Additionally, there is a lack of necessary resources and a great variety and diversity of concerns involved. Deforestation, mining, animal trafficking, damage to fauna and flora, pollution, and land issues are just a few examples of the problems faced. The Justice in Numbers 2021 report pointed out a significant increase in litigation environmental issues, which also indicates a clear increase in environmental crimes, something that is in line with the data gathered by other bodies acting to protect the environment. Thus, although the Environmental Code is considered adequate to the Brazilian reality, there is a great demand for a more efficient judiciary action, which is being done with a large use of technology, as we will see below.

The very involvement in environmental issues has been a long-standing concern of the judiciary, which can be observed in at least two ways.[450] The first, from an institutional perspective, is linked to the way the judiciary deals internally with socio-environmental and

450 A previous initiative from the CNJ and the EU maps out much of the efforts regulatory and policy related that involve this area. Retrieved from: CONSELHO NACIONAL DE JUSTIÇA; UNIÃO EUROPEIA. Justice and socio-environmental protection in the Brazilian Amazon. Brasília: CNJ, 2020; https://www.cnj.jus.br/wp-content/uploads/2020/11/JUSTICE-AND-SOCIO-ENVIRONMENTAL-PROTECTION-IN-THE-BRASILIAN-AMAZONIA_V-6_2020-12-16.pdf [01/08/2022].

sustainability issues. In this sense, there are several actions of note. The implementation of the electronic process, for example, has reduced annual paper consumption by millions of sheets. Another illustration is the way buildings are designed, tending to focus on energy efficiency, as is the case of the Superior Electoral Court, which since 2017 has had a mini solar power plant[451], promoting the reduction of financial expenses and environmental impact. To organise institutional monitoring on the topic, the CNJ has the socio-environmental dashboard, where updated data on energy consumption, paper, waste management, and quality of work are made available. Importantly, the use of technology, with investments in cloud services[452] and streamlining of workflows, has the potential to reduce the knock-on impact caused by the judiciary and its users.

The second way in which the judiciary acts on environmental issues is directly related to the integration with other agencies for the prevention and combat of environmental crimes. In Brazil, monitoring the vast green areas of the country and the diversity of biomes is not an easy affair. Investment in remote mapping since the 1980s has been one chief way to face the complexities of on the ground monitoring. In this sense, just as the PDPJ-Br represents a paradigm shift in the integration of the electronic process systems, recently the CNJ, in partnership with UNDP, started the implementation of a monitoring tool ("SireneJud"), capable of cross-referencing various information from agencies that make up the Brazilian environmental protection system. Thus, in addition to the institutional stance, the judiciary acts in the digital monitoring of environmental claims, being possible in instances to provide information on environmental crimes or even to ascertain some reported facts, which also collaborates with the recent understanding of the instance of the Superior Court of Justice (STJ) on the guarantee of access to environmental information.[453]

B. European Union

Based on the UN The United Nations Economic Commission for Europe (UNECE) Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (Aarhus Convention),[454] the Union has adopted some legal

451 *Conteúdo Jurídico*, TI Verde: a contribuição para um Judiciário socioambientalmente responsável; https://conteudojuridico.com.br/consulta/Artigos/56035/ti-verde-a-contribuio-para-um-judicirio-socioambientalmente-responsvel [01/08/2022].

452 *Conteúdo Jurídico*, TI Verde: a contribuição para um Judiciário socioambientalmente responsável; https://conteudojuridico.com.br/consulta/Artigos/56035/ti-verde-a-contribuio-para-um-judicirio-socioambientalmente-responsvel [01/08/2022].

453 *STJ*, Teses da Primeira Seção consagram direito à informação ambiental e obrigação do Estado com a transparência, https://www.stj.jus.br/sites/portalp/Paginas/Comunicacao/Noticias/27052022-Teses-da-Primeira-Secao-consagram-direito-a-informacao-ambiental-e-obrigacao-do-Estado-com-a-transparencia-.aspx [01/08/2022].

454 UNECE, CONVENTION ON ACCESS TO INFORMATION, PUBLIC PARTICIPATION IN DECI-

acts in order to promote access to justice in environmental matters.[455] These acts implement the international obligations into EU law and, by this way, into national laws. In the framework of the European Green Deal,[456] which comprises several environmental related initiatives and measures[457] to protect natural resources, the European Commission announced the adaption of the Aarhus Regulation to facilitate the citizens and NGOs access to administrative and judicial review.

Accordingly, everyone is entitled to receive environmental information from authorities within one month without giving reasons, and authorities must actively distribute information. Moreover, citizens and environmental non-governmental organisations have the right in decision-making processes by means of commenting on projects or legislative proposals. Finally, they do have the right to challenge decisions before courts in case of infringement of the above-mentioned rights or any other environmental law cases.

Also, the Parliamentary Assembly of the Council of Europe adopted a resolution "Combating inequalities in the right to a safe, healthy and clean environment"[458] which also highlighted the procedural law related to the environment and, therefore, it also implies legal consequences to the Council of Europe member states.

SION-MAKING AND ACCESS TO JUSTICE IN ENVIRONMENTAL MATTERS, https://unece.org/fileadmin/DAM/env/pp/documents/cep43e.pdf [01/08/2022].

455 REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on amending Regulation (EC) No 1367/2006 of the European Parliament and of the Council of 6 September 2006 on the application of the provisions of the Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters to Community institutions and bodies; Directive 2003/35/EC of the European Parliament and of the Council providing for public participation in respect of the drawing up of certain plans and programmes relating to the environment and amending with regard to public participation and access to justice Council Directives 85/337/EEC and 96/61/EC; Regulation (EC) No 1367/2006 of the European Parliament and of the Council of 6 September 2006 on the application of the provisions of the Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters to Community institutions and bodies; Directive 2003/4/EC of the European Parliament and of the Council on public access to environmental information and repealing Council Directive 90/313/EEC;

456 European Commission, A European Green Deal, https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en [01/08/2022].

457 *European Commission*, 2030 Climate Target Plan, https://ec.europa.eu/clima/eu-action/european-green-deal/2030-climate-target-plan_en#:~:text=With%20the%202030%20Climate%20Target,below%201990%20levels%20by%202030; European Climate Law, https://ec.europa.eu/clima/eu-action/european-green-deal/european-climate-law_en; REPowerEU; https://ec.europa.eu/commission/presscorner/detail/en/IP_22_3131 [01/08/2022].

458 Parliamentary Assembly of the Council of Europe, Resolution 2400 (2021); https://pace.coe.int/en/files/29523/html [01/08/2022].

A. Brazil

I. Sirenejud

Sirenejud is a platform developed jointly between the CNJ and UNDP and was conceived within the National Strategy of the Judiciary 2016-2021.[459] Its main task is to ensure the proper monitoring of environmental issues throughout the country, bringing to light a number of issues that were not monitored in an integrated manner by the judiciary.

The platform is fed judicial data through the Datajud system (explored in depth above). It relies as well on other public and private databases, such as those of the Brazilian Institute of the Environment and Renewable Natural Resources (Ibama), the Ministry of the Environment, the National Department of Infrastructure and Transportation (DNIT), the National Water and Basic Sanitation Agencies (ANA), the National Electric Energy Agency (Aneel), the National Institute for Colonisation and Agrarian Reform (Incra), the National Institute for Space Research (Inpe), the National Indian Foundation (Funai) and the Brazilian Institute of Geography and Statistics (IBGE) and third-sector organisations.[460]

The tool is not just a simple monitoring dashboard as others of CNJ. It is able to cross-reference, based on georeferencing and remote sensing, the regions of the country and the respective environmental processes filed or in progress in their jurisdictions. Thus, for example, it is possible to identify the occurrence of forest fires in a municipality in the extreme North or extreme South of the country and link them to ongoing lawsuits. Another example is the cross-referencing of data on deforestation in the Amazon and also the ongoing lawsuits. With this, it is possible to determine which are the most problematic focus points in a region, the incidence of a certain type of lawsuit, and the duration of lawsuits.

Sirenejud should also play a central role in two historically complex issues regarding landholding regularisation: the definition and integrity of indigenous and quilombolas

459 *Justiça Federal,* CNJ: SireneJud – Painel permite visualizar dados sobre violações ambientais; https://www10.trf2.jus.br/portal/cnj-sirenejud-painel-permite-visualizar-dados-sobre-violacoes-ambientais/ [01/08/2022].

460 *Justiça Federal,* CNJ: SireneJud – Painel permite visualizar dados sobre violações ambientais https://www10.trf2.jus.br/portal/cnj-sirenejud-painel-permite-visualizar-dados-sobre-violacoes-ambientais/ [01/08/2022].

communities[461]. Based on land registries and cross-referencing data, the platform can provide information for the identification of titles of ownership, potentially speeding up judicial processes. In addition, it facilitates the monitoring of deforestation and illegal exploitation in indigenous lands and quilombolas.

Finally, it can be said that Sirenejud can be a main technological solution of the judiciary to support environmental issues, just as PDPJ-Br will serve for the electronic process and Synapses for AI mechanisms. In common, all these tools, each in its own area, have the role of ensuring the integration of the judiciary with the intensive use of technological mechanisms. Sirenejud is in the implementation phase.

II. Other environmental and sustainability initiatives:

A. Environment Observatory of the Judiciary - OMA

The Environment and Climate Change Observatory of the Judiciary (OMA) was established in 2020 and aims to develop studies, research, projects, actions, and policies based on good practices for the protection of the natural environment and climate change through the actions of the judiciary.[462]

B. National Observatory on Environmental, Economic and Social Issues of High Complexity and Great Impact and Repercussion

461 Quilombolas are descendants of African slaves that have settle in specific areas and developed a community there. The Brazilian Constitution provides a protection akin to indigenous communities.

462 Established through Ordinance N° 241/2020; CNJ; https://atos.cnj.jus.br/atos/detalhar/3565 [01/08/2022].

On January 31, 2019, the National Council of Justice (CNJ) and the National Council of the Public Ministry (CNMP) established the National Observatory on Environmental, Economic and Social Issues of High Complexity and Great Impact and Repercussion. It aims at promoting institutional integration within the Justice System to face specific situations of "high complexity, great impact and high social, economic and environmental repercussions".[463] It intends to foster both legal and technical cooperation so that responses can be timely and feasible.

C. National Goal 12

For the year 2021, the Superior Court of Justice (STJ), the State Courts, and the Federal Courts signed Target 12, which was approved at the 14th National Meeting of the Judiciary (2020) and supported by Resolution CNJ n. 325/2020, which established the National Strategy of the Judiciary 2021-2026.[464] This goal was defined in order to boost the environmental lawsuits. Goal 12 was renewed for the year 2022 and, for this year, percentages were set for judging cases involving environmental issues distributed until 12/31/2021 in the Superior Court of Justice, State courts and Federal courts.

D. Green Judgement Award

The Green Judgement Award, established by Resolution 416/2021, aims at recognising innovative actions, projects, or programs within the judiciary, disseminating successful practices, as well as rewarding and stimulating the courts' productivity in environmental judicial provision.[465] The first edition of the award will take place in 2022.

E. National Judicial Orders and Sentences Contest

CNJ Ordinance no. 115/2022 created the National Contest on Interlocutory Orders, Sentences, and Judgments on the Environment.[466] It establishes categories for awarding prizes to judges who render decisions on the protection and promotion of the right to an ecologically balanced environment.

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463 *CNJ*, Observatório Nacional sobre Questões Ambientais, Econômicas e Sociais de Alta Complexidade e Grande Impacto e Repercussão; https://observatorionacional.cnj.jus.br/observatorionacional/ [01/08/2022].

464 *CNJ*; https://atos.cnj.jus.br/files/original182343202006305efb832f79875.pdf [01/08/2022].

465 *CNJ*; https://atos.cnj.jus.br/atos/detalhar/4109 [01/08/2022].

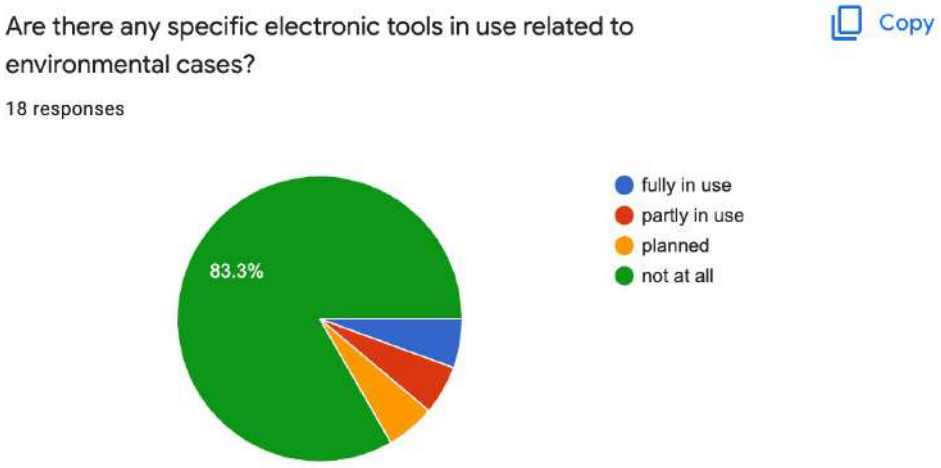
466 *CNJ*; https://atos.cnj.jus.br/atos/detalhar/4474 [01/08/2022].

F. Research and events

The CNJ has conducted and participated in several studies and events on the environmental theme since 2020. Some examples are the report "Justice and Socio-environmental Protection in the Brazilian Amazon (2021)", in partnership with the Delegation of the European Union in Brazil and "Empirical studies on the effectiveness of environmental jurisdiction in the Legal Amazon", coordinated by the Department of Judicial Research (DPJ) of CNJ. There was a second call for proposals (n. 2/2021) for the 5th edition of the series "Justice Research" that is about environmental protection. Among the events, we highlight the Brazil-European Union International Webinar: Justice and Socio-Environmental Protection Policies (2020), the exhibition "Amazônia" (2021), by photographer Sebastião Salgado, for the first time in Brazil, and other national and international events, such as the Brazil-European Union International Seminar – Exchange of experiences on e-Justice, in 2022, that held a panel about environment and Sirenejud.

B. European Union

The survey on the digitalisation of justice and the use of Artificial Intelligence in the judiciary in the EU member states disclosed that there are very few digital tools implemented concerning environmental matters. The target countries Austria and Germany stated that they do not use electronic tools specifically related to environmental cases. Of the 19 EU member states having participated, only two states answered to fully use electronic tools for environmental matters (Estonia[467] and Sweden), one state partly (Luxembourg, but only in the sense that the case management system, also in environmental crime matters, provides with ready-made formulas to assist the public prosecutor in writing the application to the court) and one state planned the implementation of such tools (Netherlands).



467 *Its answer requires further research.*

4. Comparison and results

Notwithstanding that the importance of environmental protection has been recognised in recent years, not only reflected by several legal acts and initiatives in the EU and Brazil, there still seems to be room for improvement in the development and implementation of specifically judiciary-related digital tools.

Although, due to different natural and socio-cultural conditions, the starting point in both legal areas appears to be different and there may be an incomparably greater need in Brazil to make visible and to resolutely fight environmental crimes. Anyway, the European Union and its member states should follow the path Brazil's judiciary took, in particular, with tools like SireneJud.

While these kinds of tools help to highlight the contribution of the judiciary to the quite complex and broad field of environmental matters, the data processed, moreover, they can serve as a solid basis to detect weak points and to react by means of political initiatives and legal measures, also in terms of targeted judiciary related-resource allocation.

H. HUMAN RIGHTS INTERACTIONS

1. General remarks

Discussions about e-Justice are inevitably associated with concerns about violations of fundamental principles like the rule of law as well as human rights. It stands to reason since there are at stake sensitive areas which largely affect different fundamental guarantees. While these aspects are related to a defensive rights approach, digital tools, on the other hand, can improve fundamental rights, at least indirectly, since they can accelerate or facilitate processes in favour of the implementation and enforcement of human rights.

There are several fundamental rights at stake, in particular, data protection, the right to protection of private life, fair trial guarantees, the right to information and access to justice. Not to mention the protection of specific groups and communities that tend to be more at risk or vulnerable. They are the ones that need the utmost protection by the judiciary. Certain electronic and digital tools and systems may strengthen the safeguards and guarantees of their rights be them individually or collectively (as a group or in the aggregate).

In this section, the study aims to explore how e-Justice and the tools developed can foster this protection of rights.

A. Brazil

In Brazil, judicial protections of human rights tend to be of great importance. It is reasonable to say that investments made for the digital advancement of the Brazilian justice system directly or indirectly facilitate access to justice as they enhance the capabilities of the system to not only speed up the processes but actually achieve human rights protection. The simplified service via Virtual Counter, the possibility of virtual hearings, the electronic process, the use of AI, cloud and statistics can be considered instruments that allow for more access to fundamental and human rights. Beyond this, however, there are several other specific initiatives that come from the judiciary that use electronic means to safeguard human rights.

The creation of the Observatory of Human Rights of the Judiciary,[468] a forum for debate and monitoring of demands in this area, is already an important initiative. Together with similar initiatives by courts of justice within the country and other public institutions such as the Public Defender's Offices and the Prosecution Services offer the web of services that protect the several vulnerable groups.

2. Tools

The Federal Constitution of 1988 innovated by enshrining human rights in the form of fundamental rights that are eternity clauses. In recent decades, however, several specific laws and codes have been created for the protection of different social groups. As we shall see below, many implemented technological solutions are directly related to the population protected by these laws. That is, they were created with the purpose of accompanying legal development with technological development. A practical example of this relationship is Dial 100, a kind of human rights emergency call, which consists of a telephone contact available twenty-four hours a day for complaints about human rights violations.

01. Women's rights and protection

The Maria da Penha Law, 11.340/2006, is the most important legal milestone for women's rights and protection. The law is named after Maria da Penha, a woman victim of domestic violence. It was based on this norm that the aggressions committed against women started to be more effectively restrained, as it provides for a series of measures that can be taken to remove and punish the aggressor. Since 2006, the law has inspired several other norms and court understandings in order to protect this minority.

01.1 Maria da Penha Virtual App

468 *CNJ*, https://www.trt4.jus.br/portais/trt4/modulos/noticias/332474 [01/08/2022].

It is a web app used by the Court of Justice of Rio de Janeiro that was developed by the Centre for Studies in Law and Technology of the Federal University of Rio de Janeiro (CEDITEC)[469]. It allows the woman victim of aggression to fill out a form with her data, the data of the aggressor, and the violence suffered. It is possible to attach images and audio. According to the type of aggression suffered, the victim selects the protective measures that are appropriate, in accordance with the law. At the end, a pdf is generated in which the request for the urgent protective measure is already included. This petition is automatically sent to the competent court, which takes the legally prescribed measures without the need for the woman to even leave the house. The application won awards and represented a major advance in complaints, especially during the pandemic.

01.2 National Women's Ombudsman

It is a platform created by CNJ where complaints, compliments and criticisms can be made about the monitoring of judicial processes related to women's rights. Orientation about the women's protection network is also available. A virtual form and a telephone number are available for those who have complaints about this issue and that involve the judiciary.[470]

01.3 CNJ Domestic Violence Panel

Panel that uses data and statistics from the judiciary to monitor legal proceedings related to domestic violence. As with the socio-environmental panel, here it is possible to observe the ongoing cases and judicial measures, the judicial courts that deal with this theme, among other information.

01.4 Dial 180

It is a telephone service maintained by the federal government in which it is possible to report aggression against women. The complaints are sent to the competent agencies and the processes are monitored. In addition, the service also offers explanations about the legislation that protects women and information about the network for welcoming and assisting women in vulnerable situations.[471]

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469 *PJERJ*, Aplicativo Maria da Penha Virtual, https://www.tjrj.jus.br/web/guest/observatorio-judicial-violencia-mulher/aplicativo-maria-da-penha-virtual [01/08/2022].

470 See also *CNJ*, Ouvidoria Nacional da Mulher; https://www.cnj.jus.br/ouvidoria-cnj/ouvidoria-nacional-da-mulher/ [01/08/2022].

471 https://www.gov.br/mdh/pt-br/assuntos/denuncie-violencia-contra-a-mulher/o-que-e-central-de-atendimento-a-mulher-2013-ligue-180 [01/08/2022].

02. Racial Ethnic Issues

The Statute of Racial Equality, Law 12.288/2010, is characterised by seeking to realise the rights of the black population in Brazil, historically the victim of different exploitations and aggressions. This norm brings the concepts of racial discrimination, gender and race inequality and affirmative action. Furthermore, the law intends to guarantee the State's role in protecting the black population, presenting the need for public policies in which it participates, and which are aimed at it. The combat against racism and racial insult was already included in the Federal Constitution of 1988, but the Statute presents specific legislation for this population.

02.1 Map of racism and religious intolerance

It is an application created by the Public Prosecutor's Office of the State of Bahia in which citizens can submit reports of racial or religious discrimination, racial slurs, and institutional racism (in public government agencies, private business corporations, and public or private universities) suffered or witnessed[472]. The complainant needs to fill out some information, is instructed on how to classify the crime, and must also attach as many documents (photos and videos) as possible about the fact and that help to identify the author. After the report is filed,

472 *NUNES*, Mônica. Aplicativo mapeia racismo e intolerância religiosa na Bahia. https://conexaopla-neta.com.br/blog/aplicativo-mapeia-racismo-e-intolerancia-religiosa-na-bahia/ [01/08/2022].

the information is analysed by the responsible prosecutor so that he can take the necessary measures, including sending it to a police investigation. The data from the crimes reported in the application generate a map with the incidence by category and area. This map is publicly accessible and can also be used in research and investigations. The application was recently awarded a prize.

03. Protection of children and elderly

The Statute of the Child and Adolescent, Law 8.069/1990, is the legal reference framework for issues concerning this population. This law lists the duties of the family and the State, as well as the rights of children and adolescents. This law also presents the measures that must be taken in the case of illicit acts committed by these people, as well as characterises domestic violence against children and adolescents. The Statute for the Elderly, Law 10.741/2003, presents the rights and guarantees aimed at the population over sixty years of age. Among the rights listed, the priority of care and the need to focus on the elaboration of public policies for this public stand out. Both statutes present a way to protect normally vulnerable populations and are in accordance with the constitutional principle of human dignity.

03.1 "Sabe" - Know, Learn and Protect

It is an application created by the Ministry of Women, Family, and Human Rights whose main purpose is to help children and teenagers identify and ask for help in cases of violence. Sabe was developed with a playful and didactic proposal. There is an interface for children from the age of six and another for teenagers over the age of twelve. The material available approaches themes such as exposure on the internet, sexual abuse, sexual exploitation, and the rights contained in the Child and Adolescent Statute. There is a specific field to speak directly to an operator of Dial 100. A series of recommended books for ages are available, and there are videos that help to clarify doubts about sexual abuse, not to remain silent, to recognize mistreatment, and to warn the child or adolescent not to be left unattended. This profile of children makes the denunciations by message or video call, with a click on the images[473].

04. Protection of other vulnerable groups

The previous topics have served to demonstrate the advances in legislation and the tools that have been developed for specific segments of the population. There are, however, initiatives that are not directly related to a particular statute or legal code but serve vulnerable groups and therefore deserve to be mentioned.

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473 *Ministério da Mulher*, da Família e dos Direitos Humanos, Sabe; https://www.gov.br/mdh/pt-br/apps/sabe
[01/08/2022].

04.1 Tia Lu App - Protection of LGBTI people

It is an application developed by the NGO Rede Gay Brazil, which aims to trigger a call for help over the cell phone. The initiative is being funded by the group and already works in some states. The user who asks for help will be contacted by a regional coordinator of the group who will direct him or her to file a police report, in case one has not yet been done. Another goal is to collect data that can subsidise public policies for the LGBTI community. The app is named after LGBTI rights activist Luciano Bezerra, who died of a heart attack in 2017. According to Agência Câmara de Notícias, Luciano was president of the NGO Movimento Espírito Lilás, and a public reference for gays, lesbians, and trans people throughout the state[474]. The launch of Tia Lu took place at the Participatory Legislation Commission of the Chamber of Deputies.

04.2 "Dirty List" ("Lista Suja"), Ministry of Labour and Employment

It is a registry of employers that have submitted their workers to conditions analogous to slavery. After an inspection in which such a situation is observed, an administrative process is initiated in which the accused can defend themselves. If it is determined that exploitation has occurred, the employer is placed on the dirty list. This list does not have any procedural sanctioning effect, but it does cause enormous damage to the image of the company or employer listed. The dirty list is part of the programs and actions of the human rights area of CNJ and ^has already been recognized by the UN as an example of the fight against contemporary slave labour.[475]

04.3 Citizen complaint ("Queixa Cidadã")

It is an application developed by the Court of Justice of Bahia that uses artificial intelligence so that citizens can file, for now, complaints about the supply of water and electricity. The individual downloads the app, fills in the fields according to the information requested, certifies

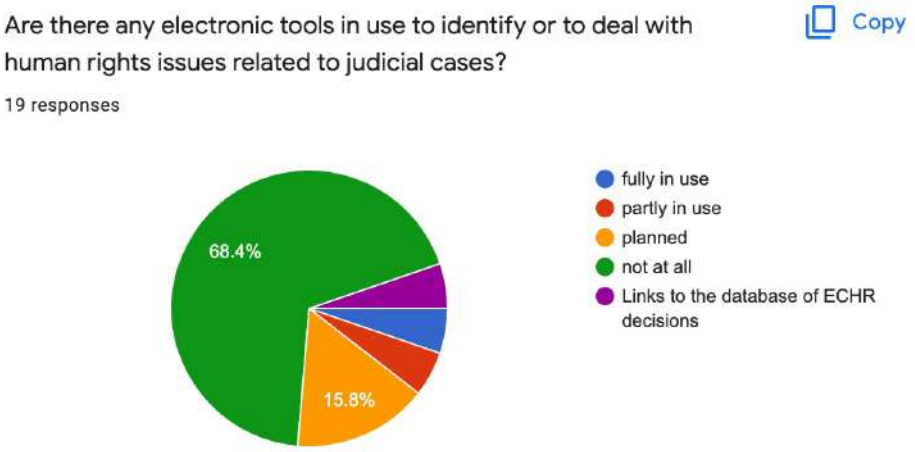
474 *ALESSANDRA*, Karla. Aplicativo para a proteção de pessoas LGBTI é lançado na Comissão de Legislação Participativa. Agência Câmara de Notícias; https://www.camara.leg.br/noticias/590615-aplicativo-para-a-protecao-de-pessoas-lgbti-e-lancado-na-comissao-de-legislacao-participativa/#:~:text=Direitos%20Humanos-,Aplicativo%20para%20a%20prote%C3%A7%C3%A3o%20de%20pessoas%20LGBTI,na%20Comiss%C3%A3o%20de%20Legisla%C3%A7%C3%A3o%20Participativa&text=A%20comunidade%20LGBTI-%20conta%20com,quarta%2Dfeira%20(25) [01/08/2022].

475 *LIMA*, Juliana. Ministério do Trabalho atualiza Lista Suja do Trabalho Escravo. Observatório do Terceiro Setor; https://observatorio3setor.org.br/noticias/ministerio-do-trabalho-atualiza-lista-suja-do-trabalho-escravo/#:~:text=A%20%E2%80%9Clista%20suja%E2%80%9D%2C%20como,atualizada%20a%20cada%20seis%20meses [01/08/2022].

the data using facial recognition and, at the end, a lawsuit is created with the first hearing. Through the application, the person can follow the process and receive notifications[476].

B. European Union and member states and Council of Europe

In Europe human rights protection has a long tradition and, subsequently, there are implemented quite a lot of fundamental rights catalogues on different levels, be it in EU law under the jurisdiction of the European Court of Justice, be it within the jurisdiction of the European Court of Human Rights (the Council of Europe member states), or on national level. Subsequently, the most important sources of human rights protection are the Charter of Fundamental Rights of the European Union, European Convention of Human Rights, and the national constitutions. Since they are closely interwoven and often refer to each other, not only directly but also in the case law of the respective courts, a high human rights' level of protection is available. Although there might be some tools related to intense interventions in the legal sphere of individuals based on ordinary laws, from the study's point of view in terms of the European side, there can only be these ones of interest, which directly refer to the protection of human rights as laid down in the above-mentioned catalogues or related to the case law of courts directly dealing with human rights. As the survey disclosed, the majority of the participating 19 member states, at the moment, do not have electronic tools related to human rights matters, 3 explicitly stated that they have an electronic tool (Estonia, Slovenia, Sweden; links to the ECHR database HUDOC), 3 of them planned the implementation (Lithuania, Netherlands, Romania), and 1 partly uses such tools (Ireland).



476 *Juizados especiais*, QUEIXA CIDADÃ - NOVO SERVIÇO; http://www5.tjba.jus.br/juizadosespeciais/index.php/noticias/286-queixa-cidada-novo-servico [01/08/2022].

01. Curia database

Curia is the database of the Court of the European Union where one can also find human rights related case law, since, on the one hand, the Court applies the Charter of Fundamental Rights of the European Union (CFR) in EU law related cases, as well as guarantees of fundamental character, and on the other hand, the CFR explicitly refers to the European Convention of Human Rights when it comes to interpretation of the same human rights.

02. EU Fundamental Rights Information System (EFRIS)

EFRIS, hosted by the European Union Agency for Fundamental Rights, gathers data from different human rights databases, and provides for analyses and assessment of fundamental rights in the European Union.[477]

03. Charterpedia

Charterpedia is a platform developed by the European Union Agency for Fundamental Rights with different stakeholders which makes available comprehensive information on the Charter of Fundamental Rights of the European Union, like article-based information, case law, legal documents as well as training materials.[478]

04. Hudoc database

The Hudoc database, which provides the whole case law of the European Court of Human Rights, is the most extensive and important database within Europe concerning explicitly human rights related cases from all Council of Europe member cases. It allows for different search approaches (full text, articles of the Convention, judicial body, state concerned, national courts involved, violation/non-violation, date related, etc.)[479] It is available in the two official languages, English and French, which makes it, in some way, more difficult to use in some member states, since only important decisions will be translated by other providers.

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477 *European Union Agency for Fundamental Rights*, EU Fundamental Rights Information System, https://fra.europa.eu/en/databases/efris/# [01/08/2022].

478 *Ludwig Boltzmann Institut*, Judging the Charter; https://charter.humanrights.at/exercise/external/18 [01/08/2022].

479 *European Court of Human Rights*, HUDOC database; https://hudoc.echr.coe.int/eng#{%22documentcollectionid2%22:[%22GRANDCHAMBER%22,%22CHAMBER%22]} [01/08/2022].

05. Further initiatives

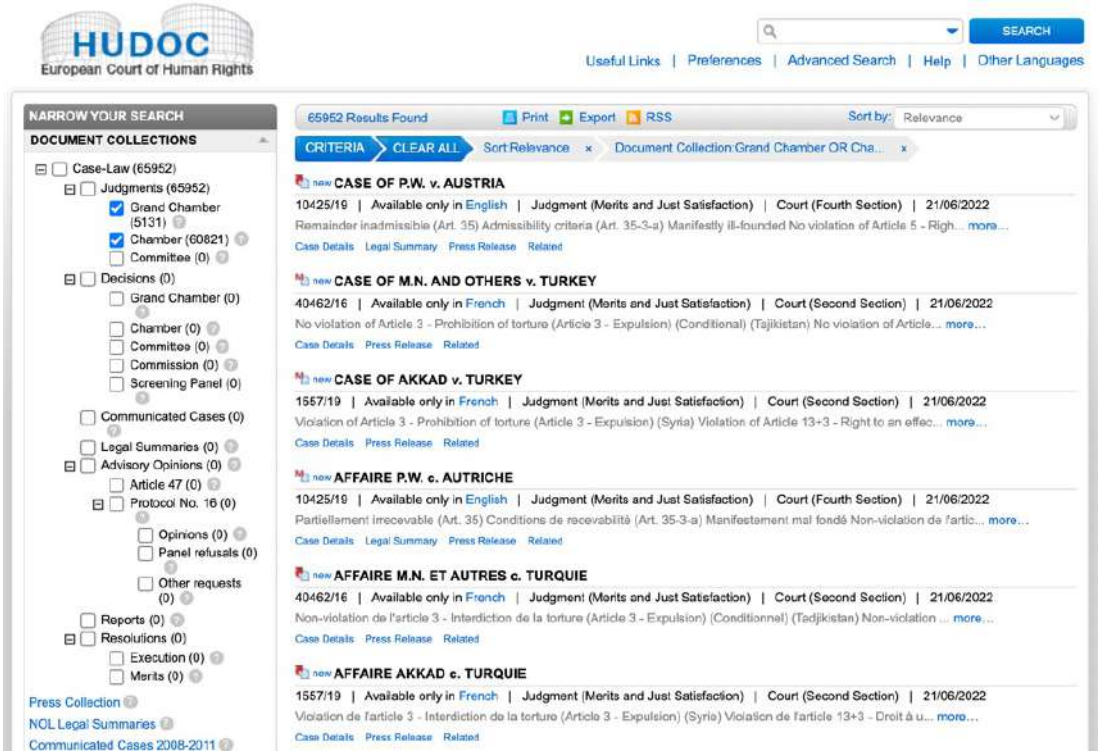
There are other digitalisation initiatives of the Council of Europe to improve human rights knowledge sharing with the national courts against the background of the principle of subsidiarity.[480] They aim at further familiarising national courts with ECHR case law in order to prevent or solve human rights disputes at a very early stage of the proceedings. In fact, it is planned to connect national courts also with the ECHR internal knowledge sharing platform and, therefore, create a digital solution. According to interviews of the authors with judges or judicial staff at different courts, judges especially at lower instance courts do not have the resources to study in detail the relevant human rights related case law.

06. Private initiatives

The Faculty of Law of the University of Zurich provides a database and a map indicating international human rights and climate change related cases.[481]

480 *Poirel*, ECHR knowledge-sharing with national courts: Legal and technical aspects International workshop Strasbourg, 15 October 2021; https://rm.coe.int/subsidiarity-workshop-cp-opening-15-oct-21/native/1680a44b93; *European Court of Human Rights*, Annual Report 2018; https://www.echr.coe.int/Documents/Annual_report_2018_ENG.pdf https://charter.humanrights.at/exercise/external/18 [01/08/2022].

481 CRRP, Climate and Human Rights Litigation Database; https://climaterightsdatabase.com [01/08/2022].



3. Comparison and results

As indicated by the results of the study, the judicial systems in the EU and its member states find themselves in the stage of awareness raising more than in the implementation phase of tailored digital tools for human rights matters. This also applies to Brazil, which concentrates on the provision of human rights-related tools for citizens while digital applications for judges seem to be rare.

Human rights, in their capacity of fundamental principles, codified in different charters or catalogues respectively, play an important role in the legal systems of the EU and its member states as well as in Brazil. Judges at specialised human right courts (like constitutional courts or international courts), as a rule, do not seem to struggle to familiarise themselves with the latest human rights adjudication. On the contrary, it is almost impossible for ordinary or administrative judges to be always up to date and to keep in mind rulings, often in another language than their native, and to apply the respective principles to their proceedings.

Subsidiarity-driven approaches or concepts including all kind of courts are considered to be applied to prevent human rights violations at an earlier stage of the proceedings and, subsequently, fight backlogs at human rights courts.

Therefore, it makes sense to make available databases or knowledge sharing bases, implement translation or indexing tools, in particular, of key cases. Also, digital tools for automated recognition of court decisions relevant for the respective pending proceedings, or direct (database-)linking of cited judgments can facilitate the judges' work and improve rapidly the quality.

I. SURVEY ON THE DIGITALISATION OF JUSTICE AND THE USE OF ARTIFICIAL INTELLIGENCE IN THE JUDICIARY IN THE EU MEMBER STATES

A. GENERAL REMARKS

The idea of the survey popped up in the very beginning of the project when it came to the identification of the target EU member states for the envisaged mission to Europe. Although there was quite a bit of published data accessible in terms of some EU member states, the general availability of reliable information of the present state of the art was quite dissatisfactory. It quickly became clear that, on the one hand, that not all member states have actual data at their disposal or at least not open to the public, on the other hand, that the present context required a precise custom-tailored questionnaire. Sure, there are quite a few EU initiatives, like the EU Justice Scoreboard, and also Council of Europe actions, like those of CEPEJ, covering this field. The problem in this highly volatile and developing field, data older than, at the most, two years is of very rare interest.

B. METHODOLOGICAL APPROACH

The questionnaire is exactly mirroring the report's structure and the areas of interest set out in the beginning: Use of digital tools, Artificial Intelligence, storage solutions, judicial statistics, digital solutions related to environmental matters, biometrics and human rights related digital tools. The questions, in general, are posed in a single choice manner and ask whether the tools mentioned in the respective areas are (1) fully in use, (2) partly in use, (3) planned or (4) not in use. The category "other" always lets space open for describing tools not mentioned in the questionnaire. This serves the purpose to identify solutions the authors were not even thinking of. Further choices concern the question which judicial authorities use the tools. Open questions are also used when it comes to the question of the most progressive digital solutions in use, the biggest obstacles related to their implementation and sources related to e-Justice in the respective EU-member state. The target group of the survey were, above all, the competent Ministries of Justice, Supreme Courts or other courts, Court Administrations or legal scholars. Thus, the authors opted for a qualitative data collection.

There were 21 answers from 19 EU member states (2 answers each from Italy and Hungary) who replied to our survey. Thus 8 of a total of 27 EU member states did not take part in the survey.

J. RECOMMENDATIONS

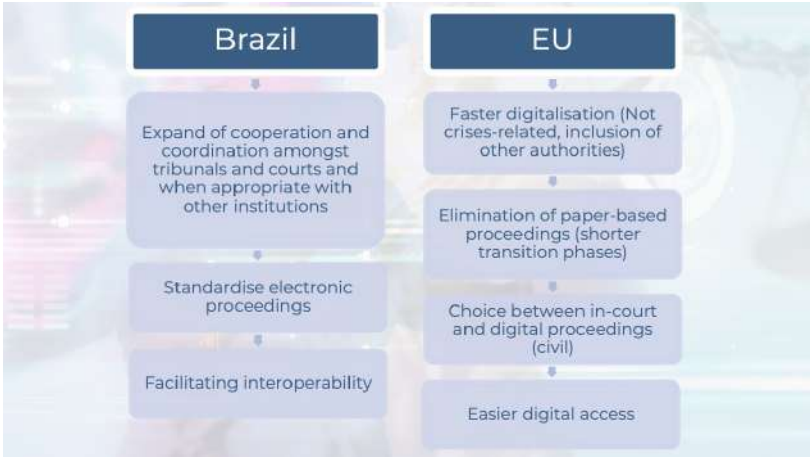
A. Introduction

Based on the information the authors of the report collected by online research, requests to the Ministries of Justice, on their missions and by the survey, the authors tried to identify possible weak points or fields needing to be improved and to formulate recommendations, on which the systems may be optimised. In general, the establishment of a constant institutional exchange, like a secondment program of legal and technical experts between the EU member states judiciaries and CNJ could strengthen the bonds between the institutions and significantly improve the level of e-Justice in the EU and in Brazil. Further joint actions could be based on the following recommendations:

A. Digitalisation

Despite the pressing importance of making justice fit for circumstances like the Covid-19 pandemic, and necessary legal and technical adaptations did take place, it was quite astonishing that, still, the European Union member states rely to a not inconsiderable part on paper-based proceedings, and the technical infrastructure is not yet updated area-wide. To a certain extent, digitalisation appeared to be understood more as a crises-related reaction and maintenance of the basic functioning of the justice system than an opportunity to make it more effective.

Set of recommendations #1:



B. Artificial Intelligence

In the field of Artificial Intelligence, the main concern of the judiciary seems to be that Artificial Intelligence solutions could reduce the discretion of judges, that algorithms could intervene intensely in the decision-making process and the AI based decisions could be biased, discriminatory and not comprehensible. Definitely, there is the risk of a knowledge gap between the developers of these solutions and the judicial user possibly relying on them in future. On the one hand, the European Union has recognised the risks and reacted with legislative initiatives or proposals. On the other hand, the high-risk approach in terms of judicial data could hinder the further development and implementation of these useful tools. It is clear that AI, at the moment, cannot reflect the complexity of judicial decision-making processes and it is not recommended to let AI decide autonomously. However, a mixed approach of AI supporting judges and letting them concentrate on the very core of judicial decision-making should not be neglected.

Set of recommendations # 2:

C. Storage solutions and statistics

All the channels included in the research confirmed the view that the major challenge of the near future will be the transition to cloud-based storage models. The existing mainly server-based infrastructure will not be able to deal with the immense amount of data involved by further digitalisation of the judiciary. Data protection raised to a major issue in the past years, in particular within the European Union. While it must be clear that the security of and the control over this data must be ensured, the exchange with Brazil, which relies to private services under predefined conditions, brought forth the idea of mixed storage models, allowing private suppliers provide service and maintenance, while the full control over the data remains within the hands of the judiciary.

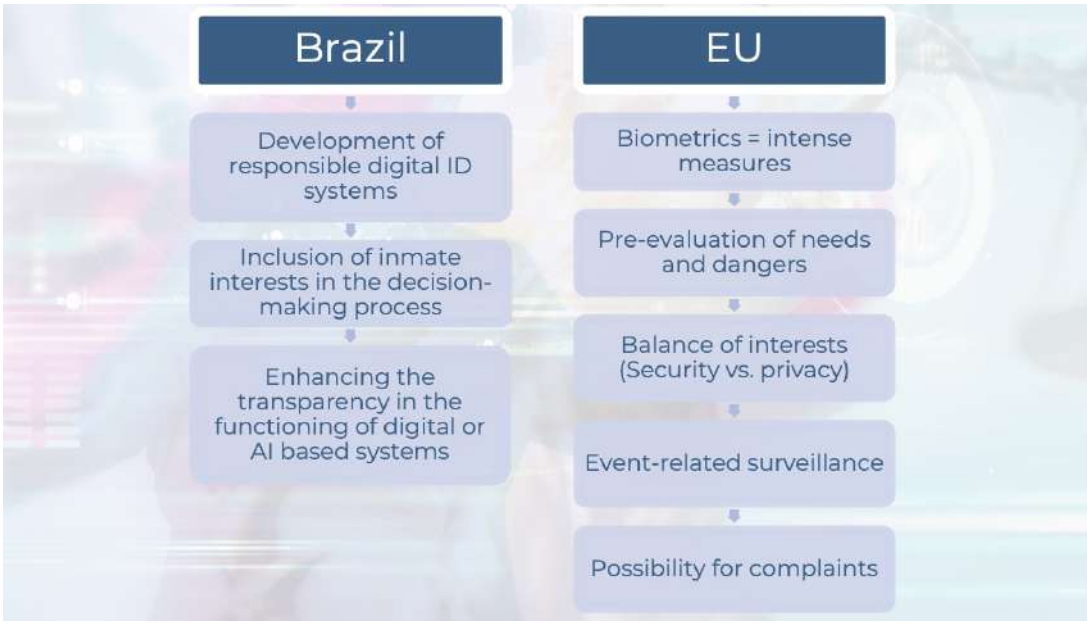
Notwithstanding that there are dashboard solutions in several EU member states available for judicial-internal use, there was no evident reason why data on the functioning of the judiciary (key performance indicators) were not open to the public. However, the importance of data-based policy making seems to become more relevant.

Set of recommendations #3:

D. Biometrics

The reliance on biometric systems within the judicial context, throughout, raises major concerns resulting in limited fields of application. One of these is the penitentiary system, where security risks not only concerning the staff's integrity, but moreover, the inmates themselves may justify more intense intervention as long as the inmates' interests are duly balanced. Besides security, in combination with AI solutions, there are several solutions (health, communication) available that may improve the inmates' conditions. Anyway, there need to be several procedural precautions to be taken.

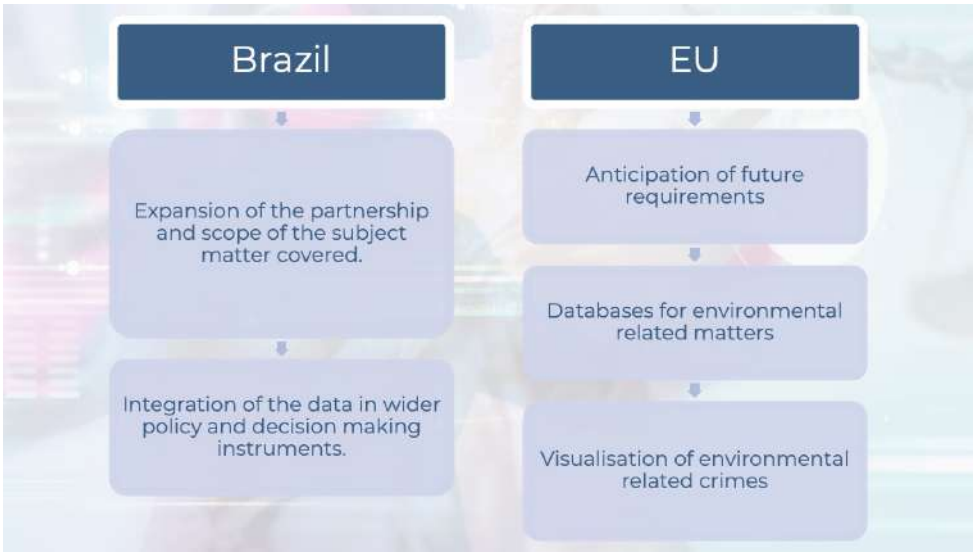
Set of recommendations # 4:



E. Environmental matters

The lack of environmental-related digital tools in the judiciary stands for itself and clearly indicates that there are measures needed to be taken reflecting the growing importance of environmental issues, not only in policymaking and amendments of the legal framework, but also in the judiciary.

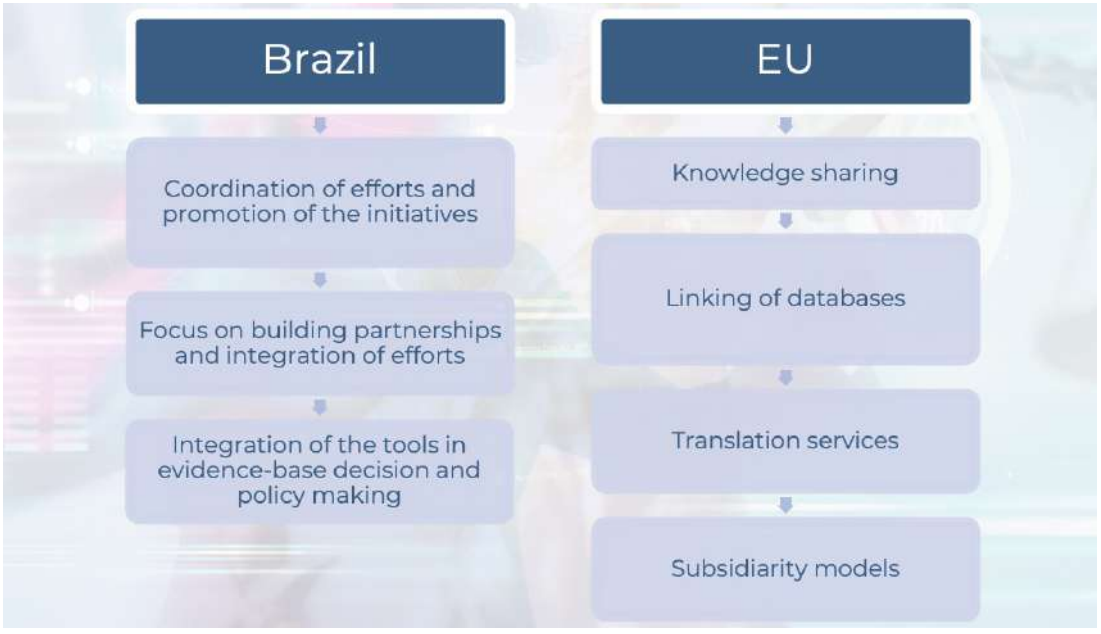
Set of recommendations # 5:



F. Human rights matters

One of the goals of digitalisation is claimed to promote efficiency and to shorten the length of proceedings. Increasing number of cases and backlogs and at specialised courts risk to thwarting these ambitions why also lower instance courts should constantly be aware of actual human rights adjudication in their own jurisdiction. To facilitate this approach for judges in their daily business, the following measures are proposed to be taken.

Set of recommendations # 6:



VI. CONCLUSIONS

In general, the action showed that the players were kind of surprised that not only the challenges but also the solutions in the respective judicial systems in terms of digitalisation seemed to be very similar. It soon became clear, that actions like the present of the EU and CNJ facilitate creating unique platforms for e-Justice experts in the judiciary beyond their own systems and mindsets. The exchange not only makes aware of the state of the own systems, their strengths, and weak points, but also motivates to break new grounds. There is no way around intensifying cooperation and realising joint projects since the different inputs and approaches accelerate further developments, in a field independent from the legal background or judicial culture.

The principles of efficiency, efficacy and economy call for sustainable technical solutions in the interests of a modern, transparent, and citizen-friendly judiciary guaranteeing timely proceedings according to the rule of law. Against the background of human rights and fundamental guarantees, in particular the right to access to justice and to a fair trial, the judiciary is obliged to optimise organisational and functional structures to be prepared for actual and future challenges. The Covid-19 pandemic made us aware of the fact that the judiciary cannot afford standing still, not only regarding case backlogs but also in terms of its important function for the state and for the society.

The authors hope to have contributed to the establishment of long-term contacts and exchange between the European Union and its member states and Brazil and provided with the present analysis a solid basis for further projects and ideas how to successfully improve the level of e-Justice in the respective judicial systems.

At this point, the authors of the report would also like to thank all EU, CNJ, and national officials for their support of the project. Our thanks, in particular, go to Zahra Pineiro Lozano and Germán da Rosa (EU-Brazil Dialogues Support Facility), Wilfredo Pacheco (CNJ), Martin Schneider and Dolores Lekaj (EJFRI), Celina Beatriz, Fabio Steibel, Guilherme Stefan, Isadora Fromenton Vargas and Nina Desgranges (ITS Rio) for their great contribution to the success of the action or this report respectively.

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Gernot POSCH

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