

# Digital Transformation in the Judiciary

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**Abstract**—This paper focuses on presenting the current state and future plans of digital transformation in the Serbian judiciary. The digitalization of judicial processes holds great potential for improving efficiency, accessibility, and transparency. By analyzing available literature, official reports, and relevant data, this research provides an overview of the existing digital initiatives in Serbian courts. It examines the implementation of electronic case management systems, on-line filing procedures, and digital communication channels. Additionally, the study explores the challenges faced in the process, including infrastructure limitations, legal frameworks, and stakeholder acceptance. Furthermore, it outlines the strategic plans and initiatives devised by Serbian judicial authorities to further advance digitalization efforts. The findings of this research contribute to a better understanding of the current state of digital transformation in the Serbian judiciary and provide insights into the future trajectory of digital initiatives in the sector.

**Keywords** - eJustice, digital transformation, eGovernment, Legal Tech

## I. INTRODUCTION

The traditional model of workflow in the judiciary primarily involves paper as a data carrier that is exchanged between authorized persons. Mostly, the procedure is initiated by the interested subject who initiates the procedure by submitting the initial act (lawsuit, proposal, application, etc.) by direct delivery or by sending it by mail to the reception offices (offices) that files the acts in book of files, classify them, form cases for paper register, apply the rules on awarding specific subject to work on case, the processor, who prepares the draft of the act, and through the person authorized to pass the act, who signs it and authenticates it with the stamp of the authority (state body) and the delivery of that act to the person to whom the act refers (addressee).

In this area, which due to the impact of the work of judicial authorities and judicial professions on basic human rights, the advantages of digital transformation are being used, but with great caution due to possible negative effects on the protection of the aforementioned goods. The leaders in this field in Europe are certainly Estonia[1] as champion, followed by The Netherlands[2] and Norway[3], and the judicial system of Singapore[4] stood out

on the global level. South Korea[5] is considered a world leader in the digital transformation of the entire public sector, not only the judiciary, and the lessons from their projects are very useful for the judiciary as well. What is common for all their achievements is that the work of courts and other judicial authorities is based on the use of advanced information systems for managing cases that are used by all participants in the procedure both for initiating the procedure (e-filing) and for performing a large number of actions in the online procedure to the extent that visiting court has become reserved only for stages of the procedure where, due to the nature of the matter, it is necessary (debates, testimonies and other personal participation) and the paper itself as a form is unnecessary or even prohibited. Qualified electronic signatures were implemented early in the electronic exchange of data and documents. The mentioned systems also have successful projects related to the implementation of blockchain in data exchange, machine learning based on large databases that were designed in such a way that appropriate data sets are recorded in them in the process and that serve as an auxiliary tool for bringing certain types decision.

Positive examples of these systems and the advantages of implemented technologies, through study visits and trainings of representatives of the ICT unit of the Ministry of Justice, directed the development of information systems in the judiciary and judicial professions towards the establishment of a single information system that will establish a uniform practice in the work of these authorities. In this paper, the degree of achievement so far will be presented.

## II. THEORETICAL BACKGROUND

The concept of digital transformation itself is defined differently and is a vague term in its meaning. It is based on the application of modern technologies and innovations and usually implies a completely new way of doing business. In the case of digital transformation, although it represents the use of new technologies, the use of these technologies is not the key, but rather it is about introducing new digital models into business and adapting to new digital trends. In addition to the process, the basic factor of digital transformation is information itself as the key re-

source of modern business. [6]. Therefore, we cannot talk about the digital transformation of the judiciary without the existence of information in the form of electronic data and their exchange.

Also, we cannot talk about the digital transformation of the judiciary without the existence of IT technologies. Legal technologies, or as they are also called in the literature, "Legal Tech", are defined as technologies used in the field of law, and also as software that could be used in this field. The most widespread definition of legal technology is that it represents the application of modern digital technologies using computers to automate, simplify and improve the extraction, application, access and administration of law through innovation. In short, this is software technology that supports and replaces the work of lawyers[7] as well as administrative and technical staff in courts, as well as communication between parties and the judiciary.

For the last 20 years, European judicial systems have been making efforts to implement projects based on electronic judicial platforms that would have the greatest possible effects on practice, as evidenced by the European Commission for Monitoring the Quality of Justice (CEPEJ), which as a huge segment of its work includes monitoring the implementation of IT solutions in the judiciary. According to CEPEJ, the basic characteristics that e-Justice platforms for the digitization of the judiciary should fulfill in order to achieve the greatest possible effects are the comprehensiveness of functionality necessary for the establishment of a complete digital process in the courts, facilitating communication to all interested parties (parties, citizens, lawyers, etc.) , as well as and enabling the transition of judicial procedures from the traditional way (paper and memo) to the digital way [8]. With the implementation of every judicial digitization project, it is clear that changing the traditional way of communication through correspondence to an electronic way of communication does not mean simple copying and imitation of the existing direction of communication, but requires changes and optimization of the processes themselves, which often imply changes in national regulations. Digital transformation also implies normative transformation and not only the use of technologies and process changes.

Bearing this in mind, it can be said that the digital transformation of the judiciary is a process of transition and replacement of traditional processes with digital ones through the use of electronic platforms, and which must be governed by valid regulations in force. Therefore, in order to talk about digital transformation, there must be one rounded segment of the process or an entire procedure that is digitized (issuing certificates, delivering solutions, publishing letters on the notice board, conducting the sale procedure at a public sale, etc.) comprehensive enough to leave noticeable effects on practice, which is performed entirely or mostly electronically using electronic platforms, and which is governed by positive regulations. If the process that we digitize is not recognized and regulated by law or by-laws, we cannot say that a transformation has

occurred, but we can say that the process is supported by electronic tools

The application and use of electronic platforms in judicial proceedings represents the conversion of legal prose into program code, which is a complex process that requires the conversion of the natural language of the law, which is expressive but also indefinite, into a program language that requires certainty. This fact certainly ranks the digital transformation of the judiciary in the highest rankings in terms of project complexity [9] .

The enormous financial effects that digitization has through savings do not bypass the judiciary either. Although the judiciary as a branch is not of a commercial character because the services it provides are not directed or guided by the realization of profit but the realization of rights, the savings that are realized in the budgets of judicial bodies by shortening the procedures and time required to carry out certain activities using electronic systems are enormous and their value is counted in billions of dinars. Also, speeding up court and judicial procedures affects the realization of higher profits in the private sector due to shorter and simpler procedures and a more favorable investment environment.

Digitization of the judiciary is a necessary and unavoidable tool and process that, first of all, should enable the shortening of the duration of the proceedings, greater accessibility of the judiciary, greater transparency of the proceedings, which further unifies the proceedings and increases the responsibility of the competent institutions. Overall, digitization helps to strengthen legal certainty, which is the ultimate goal of all judicial measures and activities.

The choice of tools that will be emphasized during the digital transformation must be adapted to each individual judicial (eco)system, bearing in mind that there are different characteristics of the problems that need to be solved in different countries in order to achieve the greatest effects on strengthening legal security. Looking at the global level, the segment that needs to be worked on the most is free and equal access to justice, bearing in mind that according to the Open Society Foundations research from 2016, 4 billion people live outside the protection of the law and the rule of law for various reasons, most often because they are marginalized from foreign society due to material condition, gender, etc(Access to Justice Stocktake of Initiatives Research Report, 2020).

As a good practice of shortening the duration of proceedings by using electronic tools for acceleration, the Judicial Information System (JIS) is used to shorten the process of obtaining data and documents necessary for the conduct of judicial and court proceedings by as much as 3 to 6 months. This shortening of procedures is the result of the fact that authorized persons in judicial bodies (courts, public prosecutor's offices, public notaries and public bailiffs) have access to data from official state registers in a few seconds via an electronic service. Since the introduc-

tion of this System in 2017, more than 25,000,000 inquiries have been made, replacing over 50,000,000 paper correspondence.

However, in addition to the benefits that the digital transformation of data exchange brings, in a system where personal data is available at the push of a button, it becomes crucial to prevent abuse of data access authority, i.e. unauthorized use of the system by persons to whom this system is officially accessible. The key to successful management of this challenge may be, in addition to the application of other procedures, in the application of blockchain technology during the process of ensuring the integrity, authenticity, transparency, traceability and auditability of databases of access and data use by system users, which will be discussed in the fourth chapter.

### III. ANALYSIS OF CURRENT STATE OF DIGITAL TRANSFORMATION OF SERBIAN LEGAL SYSTEM

If we exclude the use of computers for word processing and statistical calculations, ICT in the sense of replacing registers and records in paper was introduced systematically for the first time in 2006 with the creation of a case management system (AVP) in commercial courts, which will be rolled out by 2011. to basic and higher courts. This system is decentralized and functions on the servers of 66 basic courts, 25 higher courts and 17 commercial courts, as well as in a special department for organized crime, that is, there are actually 109 application solutions (decentralized system of "data lakes") that have a common central place for data replication, which is done once a day. The first public service has just been created from the replicated data of all courts, which is the Flow of court cases on the Serbian Judicial Portal. After the electronicization of case records in the courts and the provision of public access to this data, the next big steps in digitization followed after 2015 with the introduction of a series of web applications using more modern programming languages and technologies, and especially with the introduction of the ESB Microsoft BizTalk solution - a judicial bus for data exchange which made judicial applications interoperable.

From 2015 to 2023, a bundle of electronic systems and services were introduced, which can be divided into those that exist alongside the traditional process and make it faster and more legally secure, such as the establishment of a register of real estate transactions or electronic payment of court fees, and those that have completely replaced the traditional process electronically (such as eAuctions and submission of official documents for registration in the real estate cadastre and tax returns), those who created new procedures as an added value through digitization (issuance of extracts from the real estate list at the notary public), but also those who enabled electronic services such as service for citizens. The following will describe the systems, divided according to the described criteria, that have the greatest impact on the digital transformation of

the judiciary.

eAuction is a system that was introduced into the execution and security procedure on September 1, 2020. when the amendments to the Law on Enforcement and Security entered into force, which, among other things, provided for an electronic public sale in this procedure. Bearing in mind that this law defines the procedure for the electronic public sale of the debtor's property by the public executor as an exclusive method, this system classifies the complete digital transformation of a traditional and electronic procedure in the judiciary. The developed platform "e-Auction" enabled the electronic sale of movable and immovable things by public bidding in the enforcement procedure, a fully electronic process of announcing the public sale, making an offer (bidding), closing the sale and automatically determining the most favorable offer. Since the introduction of this platform, over 50,000 public sales of movable and immovable property have been scheduled. The main benefit of this platform is the eradication of blackmailing potential bidders for abandoning the purchase and making bids through the built-in functionality of hiding the bidder's identity, which allows the bidder to remain anonymous until the end. This created the conditions for achieving the highest possible sale price, which strengthened the position of enforcement debtors.

The information system "+ePayment of court fees", which is available at the address <https://etakse.sud.rs/>, is a system that has overcome the challenges of the decentralized system for managing court cases. The decentralization of the System for handling cases in courts has for years conditioned the development of electronic services for court services, among other things, enabling the electronic payment of court fees. This challenge was overcome by the development of a completely new centralized application for matching payments from the Treasury Administration system and a central database to which court fee balances are replicated once a day. Furthermore, from this same system, it is possible to automatically enter the paid court fee into the case management system of each court. The last step that had to be implemented was the integration with the system of the Office for IT and eGovernment +ePlaćanje (+ePayment), after which a portal was developed for online payment of court fees, which gave all parties, individuals and legal entities, the opportunity to review in one place in the cut court fees in their case and to pay them at the same time by electronic payment, i.e. via the Internet. The system enables electronic review and payment of 249 different court fees completely electronically. However, this system, although it enables fully electronic filing and payment of court fees, is not regulated by regulation as the only way to pay court fees, which makes it a fully digitalized procedure that coexists with the traditional one.

Issuing certificates on rights regarding immovable property from real estates register (cadaster) at the public notary is an example of a project in which digital transformation creates new procedures and enables authorities that are not the source of data to issue certificates from re-

records maintained by other authorities. In the digital transformation of the real estate registered (cadaster), which also is faced with the same challenge of decentralized systems of different services of the real estate cadastre, which in the transit period caused a difference between the real estate sheets obtained by the electronic service from the centrally replicated copy of the database of all cadastres (delay of replications could cause date time difference of date of issuance can be up to 3 days after date of the latest update) and certificates on rights regarding immovable property from real estates register (cadaster) that could be obtained from the specific concrete cadastre service database, which reflected the current state of records (real-time). In joint cooperation, in the Decree on the conditions for issuing certificates from real estate and pipes register from the Geodetic Cadastre Information System, by public notaries and geodetic organizations ("Official Gazette of the RS", number 91 of June 26, 2020), priority is given to the digital certificate from the immovable property list, which further meant that all state authorities and public notaries and the cadastre services themselves see the same situation for a given immovable property. Also, with this regulation and the technical integration of the system of public notaries and the system of the Republic Geodetic Institute, it is possible for notaries to issue certificate from the real estate register to parties, that is, a completely new service that did not exist before.

The ePromet Nepokretnosti (eProperty Transaction) Application is a project that has completely replaced the traditional way of registering facts important for registration in the real estate cadastre. Although the nominally subject of this Reform, which was declared to be the reform of year for 2019, is the Republic Geodetic Authority, the biggest burden in terms of integrating the systems and taking on the obligation of data digitization was borne by the judiciary, namely public notaries, courts and public bailiffs. From July 1, 2018, citizens can register their real estate with a public notary when selling real estate and enter it into the tax records on the spot, without going to the competent offices of the Cadastre and the Tax Administration. This involved the development of an application for input and delivery of data and documents used by notaries public and courts. For the sake of insurance against the fraud of double sale of the same real estate to different buyers, which was a frequent case until 2014, when this system was introduced (the Register of Real Estate Transactions is one example of an electronic tool that still exists alongside the traditional way of keeping records, but strengthens legal security because parties are protected against double sales from the same seller). This system has been expanded and harmonized for sending data to the real estate cadastre in such a way that the public notary only enters the data once, which are further distributed to 4 different authorities and the register (court to the register of real estate transactions, Geodetic authority to the records of the real estate cadastre, to the Tax Administration for classification of tax on the transfer of absolute rights and to the Local Tax Administration for the purpose of calculating property tax). This eliminates the four times entry of the same data in the

state administration, but it also enables parties to avoid visits to the counters of as many as four different state bodies by making transactions with the public notary. The effects of this system are great, so since July 1, 2018, public notaries submitted documents electronically for registration in the cadastre, submitted over 1,400,000 documents, which directly reduced the number of visits to the counters of various institutions by over 7,000,000.

The Electronic bulletin board (eTabla) is an example of a fully digitized procedure, but only for enforcement and security procedures. In order for all types of submissions to the judiciary to be covered by this way of delivery of decisions, it is necessary to continuously amend each procedural law, such as the Law on Civil Procedure, the Law on Criminal Procedure, the Law on Non-Litigation Procedure, etc. eTabla enabled citizens to have a quick and easy insight into the contents of court bulletin boards in one place. So far, the requirement for fiction has been fulfilled through the electronic bulletin board on the delivery of 1,282,962 letters (FIGURE ONE represent dynamics of usage). The prerequisites for the introduction of this System, in addition to the creation of a software solution, also included the provision of sufficient storage space, taking into account the size of the pdf format of decisions and the number of documents stored annually in this solution.

eEnforcement is a project that will completely digitize the initiation (submission of a proposal for enforcement) and the management of the enforcement and security procedures, but also the communication of the authorities of the procedure. Once again, the amendments to the Law on Enforcements and Security enabled the transformation of a traditional procedure into a digital one. Unfortunately, the initiative to amend the law to make this procedure mandatory electronic for legal entities and advocate did not result in a legal amendment, so this project is an example of digitization that will exist alongside the traditional method. This application will enable the legal entities themselves to have full insight into the cases handled by their lawyers, scheduled hearings and all other information from all participants in the procedure in a timely manner. The business logic of this software fully supports all procedural provisions, communication between authorities and delivery of letters. However, bearing in mind that the software must also support the possibility of traditional communication with the procedural authority (the enforcement debtor is not registered as a user of the eEnforcement application and documents and written documents are received by mail) greatly complicates the very logic of the software, but the actions of the procedural authority, which will have to digitize all documents which is submitted on paper by a party that does not submit electronically and vice versa. This is an example of how digitalization, which is not complete, transfers the burden of data administration to procedural authorities.

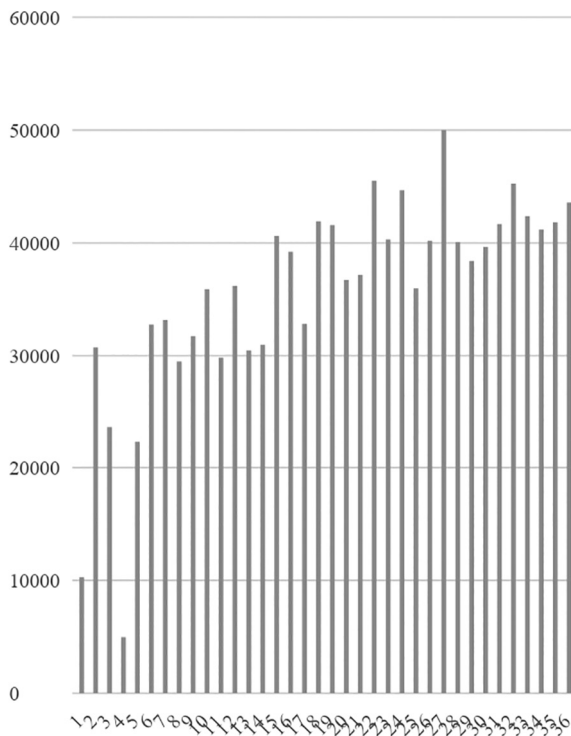


Fig. 1. Number of decisions on etabla per month

The Register of Powers of Attorney (<https://epunomocja.sud.rs>) is a register that is an additional tool in the work of public notaries as mean of legal security, i.e. a record in which they can check whether the person who presents himself as authorized to perform a certain legal transaction in the name and on behalf of another is really authorized (a document can be forged, a power of attorney can be revoked, the ruler can be deceased, etc.). The register contains an online database of issued and revoked powers of attorney, but also data regarding the fact that the power of attorney ceases to be valid in the case of death of natural person or the liquidation of a legal entity as the owner, i.e. the fact of termination or revocation of the power of attorney. This register is not just a simple record of the status of the power of attorney, but has given a new value, which is the possibility of granting authorization remotely, because citizen from a remote location within or outside the territory of our country can authorize another citizen to undertake legal transactions which does not require form of signature verification, in more modern terms, this registry introduced a new C2C service. However, even though the interpretation of the legal framework, and especially the Law on electronic documents, this service is possible according to the current regulations. It remains to be widely accepted by all business entities of legal transactions (banks, state bodies, etc.) through which citizens present themselves with an electronical power of attorney as authorized to undertake transactions in someone else's name and for someone else's account.

The service of online issuance of criminal certificates is a project that in 2021 was rated by the Office for Infor-

mation Technology and Electronic Administration as the most perfect electronic service on the eGovernment Portal, because it enables all steps to be taken electronically: submitting a request for the issuance of a certificate, paying the fee for the certificate, receiving an electronic certificates in the digital eMailbox on the eGovernment Portal. Looking back at the types of digital transformation that were described at the beginning, this service, although it completely rounds out the process of issuing a certificate, exists alongside the traditional way. From the beginning of the application of this service in July 2021 to May 2023, over 19,000 electronic certificates were issued, compared to the number of certificates that all courts issue annually (about 250,000), it cannot be said that the application, regardless of the efficiency of this service, is at its highest possible level. Closer look for the reasons for something like this is certainly the non-acceptance of these certificates in the transactions by other state bodies and that some of procedures do not recognize them in electronic form. For massive use of this service, digital transformation of other sectors in the RS will be necessary (state administration, educational administration, legal entities, etc.).

#### IV. DIRECTION OF THE FUTURE DEVELOPMENT OF EJUSTICE

The direction of further digitization of the judiciary is possible in two directions. The first would be the comprehensive digitization of existing procedures by implementing systems in a trend that already exists, through interoperable, more or less service-oriented private cloud applications with appropriate changes to legal and by-laws provisions that would exclusively or predominantly give preference to the digital way. Another direction would be the introduction and application of new technologies in the already digitized or not yet digitized judicial process, such as BlokChain and Artificial Intelligence.

New technologies should be applied where they can have the greatest value for judicial processes in terms of reducing administration for court and judicial staff, strengthening legal security or establishing new services for citizens and parties. Also, the investment in digitalization, since it is a matter of budget funds, is justified by the fact that the employees of the courts are freed from manual work and the courts are given time to devote more time to the work in which their knowledge gives the greatest value, which is, above all, the trial.

The methodology that should be used to identify the processes and technologies that should give these processes additional value is the creation of an Empathy map model that, through a series of questions that need to be asked, should answer the following elements: what are the user roles, what are their goals and needs, what are the most painful and frustrating points of the process and the system itself if it already exists, values that are important to specific users, what are the daily routines of the users of the system or process that is being digitized, what func-

tionalties would overcome the set challenges and achieve additional values.

An example of the use of the Empathy map model can be shown in the analysis of the case management system in the courts, where, after recognizing the basic user roles within the court CMS, namely: Judges, Court clerks, Lawyers, Litigants, their representatives were set up in a thought-experimental process where above mentioned questions and their answers are recorded using the methodology of Empathy and putting yourself in their shoes (familiarization). Analyzing the possible answers further, using the design thinking method, recognized business requirements that would need to be implemented in the CMS, the type of users to whom they should be available, as well as the way (methodology, concept, technology) in which they can be realized.

Table 1 contains the result of this thought experiment, which identified the key needs in the work, which were then connected to the corresponding services and concepts.

Table 1. Empathy map model

ID	EMPHATY MAP MODEL		
	Business requirement name	User role	Software solutions
1	Online submission of documents	Lawyers + Litigants	web service, eID
2	Online access to case documents	Lawyers + Litigants	web service, eID
3	Collaborative tool for documents	Judges + Court Clerks	share point, private cloud
4	Video-conferencing	Judges + Lawyers + Litigants	cloud
5	SaaS - Courts as end users	Court staff	cloud
6	Electronic data exchange	Judge + Court clerk	blockchain
7	Personal data protection	Judge + Court clerk + staff	blockchain, private cloud
8	Qualified electronic delivery	All users	web service, blockchain
9	Case weight	All users	machine learning
10	Issuing certificates	Court clerk + Litigants	web servis, eID, blockchain

After clearly identifying the processes in which the application of new technologies would give the greatest value, it is necessary to analyze the rationality and financial profitability of the introduction of this technology in relation to the benefits and added value they bring.

Without exception, Personal data protection in Electronic data exchange is the area in which the application of blockchain technology would have the most justification, regardless of the financial cost that the implementation would require. Bearing this in mind, we will look at the model that should be applied in the framework of electronic inspection and obtaining data from public registers of state bodies through JIS, which is described in chapter

3. Namely, bearing in mind that through this system, more than 25,000,000 electronic certificates from official registers for the purposes of conducting judicial processes, in addition to all the procedures that have been established, it is clear that the supervision and control of the acquisition of personal data is made more difficult by the transition to an electronic method. While we all enjoy the benefits of a data-driven society, there is growing public concern about user privacy.

Centralized organizations - both public and private - accumulate large amounts of personal and sensitive information. Individuals have little or no control over the data held about them and how it is used [11]. In this environment and scale, to ensure data protection, query execution monitoring must be frequent. Supervision must be carried out by controlling and comparing the database of the inquiry log and the subject in connection with which the inquiry was made with the data from the case, i.e. whether the subject of the inquiry is a party to the specified procedure. Also, even more effective monitoring of the use of data could be achieved by enabling a platform through which every citizen with an electronic signature could check which authorities and for what purposes checked personal data, which would represent irrefutable proof of the use and purpose of use of personal data.

This irrefutability of evidence can be achieved by using blockchain technology, i.e. multiple decentralized confirmations of data on executed queries and storage in multiple books, but so that the competent authority (in this case the Ministry of Justice) keeps the "Golden Record" - a log database of confirmed blocks in one central place. Each log should be validated by several nodes and aggregated into a block as part of the Justicechain that reflects the "true state" [12]. Each node has its own chain, but a copy of the confirmed one is kept in the central JIS log database. The set of surveillance data carried out by the competent authority (in this case the Ministry of Justice or the Commissioner for the Protection of Personal Data) will be the second block in the chain that is also written both in the distributed chain and as a copy of the consensus in the central log. In case of conflicting records from several chains, trust in the accuracy of the data should be given to the "Golden Record".

The application of new technologies such as AI Machine Learning, although for now in the area of the recommendation of the decision and the amount of the penalty based on the available information, was evaluated by the highest judicial authority as an impermissible influence on the free decision of the judge, its greatest contribution in the application, as shown by the Empathy map, could show in Case Weight combined with random distribution of cases, so as to enable an equal workload for judges and thus ensure speeding up of proceedings, better planning of personnel capacities, but also rationalization and optimization of budget costs through better allocation of funds, which would more than justify the cost of introducing this technology.

## V. CONCLUSION

A significant number of electronic services in the judiciary and the result of their use, measurable through the scope of use for processing data and documents, has shown that there is a justified need for digital transformation in this domain. In addition to the challenges related to the provision of infrastructure and human resources, which are present both in other domains and in the domain of the judiciary in other countries, in the Republic of Serbia it is necessary to orchestrate changes in the insufficiently precise legal framework, the selection and implementation of appropriate technologies and organizational changes that it is not easy to plan so that they are implemented in a timely manner, bearing in mind the strict and gradual legal procedure and the budget framework. In such an environment, and especially in the absence of a centralized information system that is present in the courts of more electronically advanced countries, the only breakthroughs towards further digitization were individual information systems that digitize individual procedures.

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