THE SPACE OF POSSIBLE E-JUSTICE PROCESSES

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Abstract: *This paper outlines an idea of a space of possible e-justice processes. Such a space results from combinations of elements that describe such processes. The awareness of the possible combinations of these elements is essential for designing online courts and public and private ODR platforms. The point of departure for the investigations is that the general structure of justice processes, shaped in the 19th Century and extended and modified in the 20th Century with the rise of ADR methods, still represents a limited array of approaches in this area. Most of the viable solutions remain unexplored due to the constraints related to limited resources, traditional institutional settings and insufficient technological solutions. However, with the rapid development of new AI technologies which facilitate a range of activities in the justice processes, numerous additional possibilities should be considered seriously to broaden access to justice.*

1. Introduction[1]

In the 19th and 20th centuries, the design and operation of the justice system were profoundly influenced by the constraints of financial resources, available manpower, and the technological landscape of the time. The procedural and bureaucratic intricacies that we associate with traditional legal systems were, in many respects, products of necessity; the limited means available demanded rigorous manual oversight and substantial human intervention. However, the dawn of the 21st Century has heralded unparalleled technological advancements, with artificial intelligence (AI) and related technologies particularly transformative. The implications for the justice system are manifold. AI can facilitate the expeditious analysis of vast quantities of data, thereby potentially revolutionizing evidence assessment, case law research, and the prediction of legal outcomes. Automated systems can further streamline administrative tasks, reducing the margin for human error and expediting legal processes. Moreover, emerging technologies can potentially democratize access to legal resources, making justice more accessible to marginalized and underserved populations.

This paper discusses a potential approach for the expanded application of information technologies in developing systems supporting e-justice processes. In our view, a comprehensive outlook on this problem is needed. Rather than solely concentrating on the technological enhancement of the existing solutions, it is also

necessary to reflect on the assumptions concerning why the existing justice processes are as they are and how technology may serve to relax these assumptions and lead to the development of actual new types of justice processes, or at least new and more robust combinations of the existing solutions. The structure of the paper is as follows. In Section 2, we discuss the basic methodological assumptions of the approach. In Section 3, we briefly present the three basic perspectives relevant to the modelling of (e-)justice, with particular emphasis on the structural perspective. Section 4 presents the systematization of categories which enable the description of the building blocks of any justice process. Section 5 discusses the directions of research and development enabled by this systematization.

2. Towards the Comprehensive Description Framework of the e-Justice Processes

Presenting a space of possible e-justice processes requires a relatively complete description of such processes. However, the latter is an enormously complex task, encumbered with several methodological problems. Perhaps the most critical problem in this context is the lack of a universally acceptable foundational conceptual scheme. This difficulty is, to a degree, ineliminable. Any such foundational conceptual scheme would be either overly abstract (hence, not applicable directly to the modelling of any concrete processes), or arbitrary (hence inapplicable in numerous jurisdictions, areas of law, or types of processes) or overly casuistic and eclectic, therefore excluding scalable application, especially for the future. Moreover, it should be noted that concepts playing a vital role in the process of development of such a description may be formed on different levels of legal discourse (legal-philosophical, theoretical, comparative, doctrinal, related to particular regulation etc.) and also in other discourses (such as psychology, game theory, argumentation studies or computer sciences), where the latter concepts may in turn be incorporated into the different levels of legal discourse. Significant interplays exist between these discourses. Particularly, it must be emphasized that at least some concepts useful for describing justice processes are dependent on the normative contexts, and the understanding of these contexts, in turn, relies on the interpretive practices across branches of law, jurisdictions and even particular courts and other law-applying entities. Even more complexity follows from the multilingual character of the contemporary legal orders, such as the legal order of the European Union.

Considering the character of these complexities, it would be untenable to advocate a rigid conceptual scheme for the abovementioned purposes, as the space of possible e-justice procedures should be applicable in the future. Instead, the approach must provide built-in procedures for updating, refinement and revision of the presented scheme. Therefore, the description framework enabling the reconstruction of space for possible e-justice processes should be based on the following methodological postulates.

Open-ended character. Extensibility and revisability. The descriptive framework should be open-ended in the sense of extensibility (the possibility of introducing new categories and relations) and revisable (substituting the existing categories and relations with new ones when appropriate; the "appropriateness" criteria set may themselves be subject to modification; however, the basic ones follow from the remaining postulates).

Neutrality. The framework should remain as neutral as possible concerning considered jurisdictions, formal languages and tools potentially applicable for the purposes of the modelling, and the technological solutions which may be used for the sake of practical implementation of systems supporting the processes. Of course, the use of ethnic language in the basic formulation of the framework unavoidably encumbers it with some connotations of the relevant terms used in English-spoken legal cultures. Moreover, the framework is principally developed to represent the structures developed in the broadly construed legal culture based on the rule of law. However, it should not be essentially based on any specific jurisdiction-dependent vocabularies; to the contrary, it should aim to capture concepts present in jurisdictions where very different conceptual choices are made on the foundational level.

Relative Exhaustiveness. The framework should enable the description of potentially any e-justice process, that is, any such flow of activities that facilitates access to justice for interested entities. Consequently, the Framework should enable the description of both judicial and extra-judicial proceedings, including all classical alternative dispute resolution methods (arbitration, mediation, negotiations) and less common approaches such as conciliation, early neutral evaluation, mini-trials and hybrid models like med-arb (a blend of mediation and arbitration).[2] Most importantly, the building blocks of the framework should also enable the construction of new, even previously unconsidered solutions and encapsulate support platforms providing relevant information for dispute resolution.

Contextuality. The framework should not represent its concepts as atoms but rather emphasise their intrinsic dependencies. This methodological postulate traces its roots back to the idea of concepts as inferential nodes.[3] Still, it extends it by focusing on functional dependencies of structures represented as concepts. This is another reason why the framework does not aim at providing any stable set of definitions: it rather enables representing clusters of concepts. They may be connected with the classical is-a-kind-of or is-a-part-of relations.[4] The framework enables the representation of concepts on different levels of abstraction. However, it is also designed to support relations that enable the sets of tokens instantiating the concepts to realise certain functions[5] (such as presenting a claim before a dispute resolution authority, presenting evidence, arguing a position, etc.).

The framework takes *states of affairs* as a primitive term. Intuitively, a state of affairs is a correlate of a descriptive sentence. State of affairs may occur in a given universe (then they are facts in this universe) or remain hypothetical states of affairs. Notably, some states of affairs may be intended or postulated by some entities.[6] Further, states of affairs may be connected by a relation of incompatibility: if two states of affairs, a and b, are incompatible in the universe U, they cannot become facts in U. If two entities, P and D, are each aiming at realisation of a state of affairs and these states of affairs are incompatible, we say that P and D conflict. If they are undertaking steps towards the realisation of the incompatible states of affairs in U, we say that there exists a dispute between P and D.[7]

In some postulated worlds, P and D would be able to settle their dispute by adjusting their attitudes towards the desired states of affairs in such a way that they would be able to aim at the realisation of compatible states of affairs. However, this situation – a non-empty ZOPA (Zone of Possible Agreement) is not always available.[8] This is precisely where the dispute resolution process may be aided by constraints provided by the law, beginning with the substantial legal constraints defining the primary allocation of rights, duties and powers through procedural legal rules establishing different forms of adjudicative and non-adjudicative dispute resolution processes, to meta-norms concerning the application, creation and identification of lower-level norms.[9] Moreover, in the contemporary legal systems, the pivotal role of legal principles, for instance, those protecting fundamental rights, is also recognised. Importantly, the application of legal norms in connection with dispute

2   GOLDBERG, S. B./SANDER, F. E. A./ROGERS, N. H./COLE, S. R. Dispute resolution: Negotiation, Mediation, Arbitration, and Other Processes. Aspen Publishers (2012).

3   SARTOR, G. (2009). Legal concepts as inferential nodes and ontological categories. In: Artificial Intelligence and Law, Vol 17, 217–251 (2009). Ross, A. Tû-Tû. In: Harvard Law Review Vol. 70, No. 5, 812–825 (1957).

4   CASELLAS, N., Legal Ontology Engineering: Methodologies, Modelling Trends, and the Ontology of Professional Judicial Knowledge, Springer, Dordrecht (2011).

5   FERNÁNDEZ-BARRERA M./SARTOR G. The Legal Theory Perspective: Doctrinal Conceptual Systems vs. Computational Ontologies in: Sartor, G., Casanovas, P., Biasiotti, M., Fernández-Barrera, M. (Eds.). Approaches to legal ontologies: Theories, Domains, Methodologies. Springer Science & Business Media (2011).

6   HAGE, J. Foundations and Building Blocks of Law. Eleven International Publishing (2018).

7   ARASZKIEWICZ M./PŁESZKA K. The Concept of Alternative Dispute Resolution, in: Araszkiewicz M., Czapska J., Pękala M., Płeszka K., eds., Mediation in Poland, Kraków, 21–78 (2015).

8   CARNEIRO, D./NOVAIS, P./NEVES, J. Conflict Resolution and its Context: From the Analysis of Behavioural Patterns to Efficient Decision-Making. Springer, Dordrecht (2014).

9   HART H. L. A. The Concept of Law, (2nd edition; 1st edition 1961). Oxford University Press, Oxford (1994).

resolution processes involves solving different problems (issues), for instance, concerning the validity of legal norms, their interpretation, evidence evaluation, and overall balancing of legally relevant reasons in the process of application of law and finally the enforcement of the decision. The modes of reasoning involved in these different layers include rule-based, case-based and value-based reasoning, as well as considerations based on the notions of coherence.[10] In amicable dispute resolution contexts where legal constraints play a less active role (they mainly delineate the boundaries of allowed activities), the reasoning based on rational choice theory and moral considerations may become more significant.

In summing up the above considerations, the descriptive framework should enable the representation of any building blocks that may be used to characterise an e-justice system, including the entities taking part in the processes, the processes themselves understood as sequences of activities and events, the structures of knowledge enabling multifeatured characterisation of any activity, and all the reasoning processes that are necessary in the steps of the represented processes. Due to the fact we are focusing on e-justice processes, that is, the processes supported by information technology, it is vital to underscore the nature of the solutions available for the modelling of each of these aspects.

3. Three Perspectives on e-Justice Processes Modeling

Practical modelling of e-justice systems has to be considered from several perspectives. We argue that none of these is a dominating one, thus all must be included in the complete design methodology. However, the actual order of their analysis can differ in specific cases.

Considering that the systems implement certain legal procedures, one natural perspective corresponds to this procedural, dynamical aspect of operation, where we consider sequences (often complex and conditional) of certain steps. In such a case, we are focusing on a certain process, and we will call this the processual perspective (PP). On a very general level, a process can be considered as a series of actions. From our perspective the flow of these actions can be conditionally driven. There are several notations developed by different communities that aim at modelling processes. These notations are based on different types of diagrams and can be normalized, standardized, or even formalized on a mathematical level.

In the computer science and software community, modelling languages must be standardized. The most common and important modelling language is UML (Unified Modeling Language). In the last decades it has incorporated several classes of diagrams for different perspectives on modelling. UML was adopted and managed as a standard by the Object Management Group (OMG).[11] Currently there is also an ISO/IEC 19501 standard for UML. From the process perspective the UML activity diagram is often used. Together with the use case diagram it can capture the process and situate it in user-context.

In business applications, a more general concept of a business process (BP) is introduced to extend process modelling with a broad organizational and business context.[12] In fact, BP modelling notations are a compromise between formalized computer science notations and flowcharts.

Event-driven Process Chain (EPC) is a basic widespread community notation for BP modelling. It was proposed as a part of the ARIS concept (Architecture of Integrated Information Systems) which is oriented on enterprise information systems and was later adopted by the SAS company. An EPC diagram is an ordered graph of events/actions/functions where decision flow is controlled by basic logical operators. EPC diagrams are now often replaced by BPMN models.

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10   ASHLEY, K. Artificial Intelligence and Legal Analytics: New Tools for Law Practice in the Digital Age, Cambridge University Press, Cambridge (2017). BENCH-CAPON, T. HYPO'S legacy: introduction to the virtual special issue. In: Artificial Intelligence and Law, Vol. *25,* 205–250 (2017). BONGIOVANNI, G./POSTEMA, G./ROTOLO, A./SARTOR, G./VALENTINI, C./WALTON, D. Handbook of Legal Reasoning and Argumentation. Springer, Dordrecht (2018).

11   BOOCH, G./RUMBAUGH, J./JACOBSON, I. The Unified Modeling Language User Guide (2 ed.). Addison-Wesley (2005).

12   VON ROSING,M./SCHEER, A-W./VON SCHEEL H. The Complete Business Process Handbook, Elsevier Amsterdam (2015).

OMG has also been responsible for maintaining the standard of the Business Process Model and Notation (BPMN) which has been collaboratively developed by the wide BP community. BPMN was originally proposed 20 years ago, and since then was largely extended, with the current version being 2.0.[13] However, all versions since 1.0 shared some basic concepts. The process diagram (model) is com-posed of activities connected by gateways, with optional events. The current rich standard introduced many elements, including choreographies for complex workflow, and is often considered overcomplicated. Yet, it is a fact that currently BPMN seems to be the most widely adopted standard for process modelling. What is also very important is the availability of many modelling tools, several of them open. Additionally, in the legal context, which in significant part is centered around decision-making, the Decision Model and Notation[14] can be either employed independently or in conjunction with the BPMN (see below). Finally, thanks to the defined metamodel and additional specification, there are methods to execute BPs modelled in BPMN using complete BP engines.

However, it is worth noting that the aforementioned processes are situated in a specific conceptual context of legal knowledge. The conceptual structure of this legal knowledge must be considered, properly captured, and adequately represented. We will call this the structural perspective (SP). Legal processes such as ODR-related ones are based on legal knowledge. It is a foundation of concepts present in activities and allows to define the proper flow of the process. This knowledge has mostly hierarchical structure where complex relationships between concepts can be observed. This structure should be considered a backbone of the processes. To properly capture and model it, several models can be used.

A basic approach, following the OMG technologies is to use UML class diagrams. This is a rich visual representation and the most widely spread one from the computer science point of view. Class diagrams have very expressive semantics. If UML activity diagrams are used for processes, having the vocabulary described in terms of class diagrams, allows for a more unified approach.

However, for taxonomic knowledge modelling, classic knowledge representation methods are commonly used.[15] The most natural ones in this context are in fact formal computational ontologies. A widely cited definition of an ontology in such a context[16] is that an ontology is a formalization of a shared conceptualization. In the last decades, several languages for ontology modelling and development have been proposed. Currently, the standard solutions were developed by the Semantic Web community.[17]

The widely accepted standard for ontology modelling is OWL (Web Ontology Language) v2.0. It offers three different profiles that offer different expressiveness while preserving computational tractability. Besides being developed as a dedicated tool for terminological knowledge modelling, OWL is also fully formally defined in a dedicated logic, a subset of first-order predicate logic called Description Logic. This allows for automated inference and formal analysis of the developed ontology models.

Legal knowledge also has a strong logical aspect, as logic is one of the main conceptual means for actual legal reasoning and inference. Law is also most often expressed in terms of rules. These logical aspects are crucial elements that allow us to connect the SP and PP on several levels. This includes, but is not limited to, high-level constraints for the PP, relationships between concepts in the SP, and logical formulations of certain tasks in the PP. We will refer to this as the logical perspective (LP).

Rules are one of the most natural ways to express declarative knowledge and inference. Rules have also been omnipresent in the formulation of legal systems. Rules can take different forms, depending on the intended inference, e.g., deduction, abduction, or induction. They can also express constraints. Rule-based systems are

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[13] Business Process Model and Notation™ (BPMN™) Version 2.0 OMG (2011).
[14] Decision Model and Notation™ (DMN™) Version 1.5 beta, OMG (2023).
[15] Van Harmelen F./Lifschitz, V./Porter, B.W. Handbook of Knowledge Representation. Foundations of Artificial Intelligence 3, Elsevier Amsterdam (2008).
[16] Gruber, T.R. A translation approach to portable ontology specifications. Knowledge Acquisition, Vol. 5, No. 2, 199–220 (1993).
[17] Hitzler, P./ Krötzsch, M./Rudolph S. Foundations of Semantic Web Technologies. Chapman and Hall/CRC Press (2010).

also key components to build decision support and expert systems. Finally, rules are one of the preferred solutions for reasoning in tasks described with notations such as BPMN.

Furthermore, rules – if properly formulated – can be formalized using logical calculi, from propositional logic to selected subsets of predicate logic, as well as attributive logic. This opens up broad opportunities for knowledge analysis and verification.[18]

Moreover, from the design, but also a logical perspective, rules can be grouped and structured into decision tables. A common way is to group to build such tables is to have rules sharing the same attributes. Finally, a rulebase, i.e., a collection of rules, can be converted (under certain conditions) into a decision tree which also captures the order of inference more transparently.

Finally, it should be underscored that during the last few decades, a logical approach towards the modelling of legal reasoning as argumentation has gained prominence. The models are typically founded on the crucial assumptions of argumentation frameworks theory[19] enabling representing not only abstract, but also structured argumentation[20] and different aspects of legal argumentation such as burdens and standards of proof.[21] Specific types of legal reasoning patterns, including arguments based on interpretive canons, are analysed as argumentation schemes[22] which enables their critical scrutiny through the sets of assigned critical questions.[23]

4. The Features of e-Justice Systems

We propose that the characterization of e-justice processes is given by the choices concerning 20 categories. The options present in the particular categories represent the crucial building blocks which aim to enable the representation of any possible e-justice process relative to the set of categories. The sources of these categories are multifarious, and they include the results of the literature review on the ODR systems (including the checklist presented by Loebl[24]), the analysis of the legal sources and model rules concerning different e-justice procedures, as well as the research on legal ontologies. Notably, below, we outline the description of the categories on the most abstract level. They can be further concretized to represent the canonical justice processes such as adjudication, arbitration or mediation and eventually to model the specific procedures in particular jurisdictions and domains of law. Importantly, the categories listed below represent different features of ODR systems descriptively, and as such, they do not represent any evaluation criteria directly. However, they may serve as the basis for developing checklists for potential evaluation or certification processes.

1) **Status of the Host of the Process** – the entity ultimately accountable for the availability of e-justice processes. While pinpointing the host is relatively straightforward for canonical proceedings (for instance, in judicial proceedings, where the host is typically the State, specifically the judicial branch as delineated in constitutional law, or in traditional commercial arbitration where the host is a private institution), the dis-

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18 LIGEZA, A. Logical Foundations for Rule-Based Systems, 2nd Ed. Studies in Computational Intelligence 11, Springer, Dordrecht (2006).

19 DUNG, P.M. On the acceptability of arguments and its fundamental role in nonmonotonic reasoning, logic programming and n-person games. In: Artificial Intelligence, Vol. 77, No. 2, 321–357 (1995).

20 PRAKKEN, H. From logic to dialectics in legal argument. ICAIL ,95: Proceedings of the 5th international conference on Artificial intelligence and law, 165–174 (1995). PRAKKEN, H., SARTOR, G. A formal framework for combining legal reasoning methods. In: Proceedings of the 19th International Conference on Artificial Intelligence and Law, Braga (Portugal) 2023. ACM Press, 227–236 (2023).

21 GORDON, T.F./WALTON, D. Proof burdens and standards. In Rahwan I./Simari G. (Eds.) Argumentation and Artificial Intelligence. Springer-Verlag, 239–260 (2009). PRAKKEN, H./SARTOR, G. A logical analysis of burdens of proof. In: Kaptein, H./ Prakken, H./Verheij, B. (Eds.). Legal Evidence and Proof: Statistics, Stories, Logic. Farnham: Ashgate Publishing, Applied Legal Philosophy Series, 223–253 (2009).

22 WALTON, D./REED, C./MACAGNO, F. Argumentation Schemes. Cambridge: Cambridge University Press (2008).

23 Araszkiewicz, M. Critical Questions to Argumentation Schemes in Statutory Interpretation. In: Journal of Applied Logics – IfCoLog, Journal of Logics and their Applications Vol. 8, No. 1, 291–320 (2021).

24 LOEBL, Z. Designing online courts: The Future of Justice Is Open to All. Kluwer Law International B.V. (2019).

tribution of responsibilities (such as regulation, monitoring, infrastructure providing) may vary in actual or forthcoming ODR systems.

2) **Host Function.** Importantly, some hosts may not actively participate in the dispute resolution processes. Such would be the case with eg. most administered arbitrations. It is worth underlining that even if the host does not participate directly in the e-justice process, they may essentially influence it by, for instance, providing regulations or infrastructure that constrain certain activities.

3) **Principal Entities and their Functions.** At the outset, this category allows to indicate whether activities in the process should be performed by natural agents only or by juridical entities (such as companies or foundations, eventually represented by natural agents acting on their behalf), or also by artificial agents. Further, it aims to identify whether the particular dispute resolution process leads to an authoritative outcome determination (whether it be the determination of legal or factual issues) or rather provides support (of different types) to parties trying to reach an amicable settlement.

4) **Scope of the Process.** This category enables identification identification of the specific limitations or criteria that define the scope of this process, including territorial, party types, area of law, subject matter, type of claim, the value of the claim, type of remedies or sectors of business.

5) **Deontic Classification of the Process Use.** Is the process mandatory or optional? Does the process have different deontic classifications with regard to different parties?

6) **Consequences of non-use of the process with regard to an issue.** The specific regulation may assign different consequences to the decision of non-use of a given process with regard to a given issue. Depending on whether the use of the process is defined as mandatory or optional, and on the character of the party and the issue in question, these consequences may consist in the impossibility of attaining a certain goal, in increased cost of the proceedings or in the necessity to apply another, typically more complex, procedure.

7) **Typical roles.** What are the key roles or actors involved in this process? Are there specific responsibilities associated with each role? Are the representatives in the proceedings acting within their professional capacity or not? Answering these questions should enable the investigator to obtain a complete list of entities that may participate in the process with their important characteristics and functions.

8) **Activities – complexity.** Are the activities involved in this process simple (e.g. making an atomic statement) or complex (e.g. Pursuing a multi-stage procedure)?

9) **Activities – categories.** This category set is by far the largest one, and not without a cause: the framework has been prepared to represent structural knowledge important for processes modelling, where processes are, principally, sequences of activities. With that being said, there are a few key subcategories to be indicated:

   a. **Deontic status of an activity.** A particular activity may be prohibited, obligatory or permitted (for a certain entity, in general, or only under certain conditions).

   b. **Communication channel used to perform an activity.** Classical legal procedures emphasise the role of written text in communication. The electronization of justice systems naturally supports other options via teleconferences or pictorial representation of communicated information.

   c. Importantly, some activities made by some entities may be **binding** (with certain respect) on other entities. This will take place when one agent assumes the role of deontic authority concerning another agent.

   d. The communication acts by entities recognized in the process may carry different **contents**. In particular, they may concern facts of the case, applicable law, interests or goals of the parties etc.

   e. **Reaction to activity or lack thereof.** Entities recognised in a given process may provide different reactions to the activities of other entities and their own. We intend to highlight the role of argumen-

tation of e-justice processes, and specifically include three principal types of attack of an argument, that is, undermining (attacking a premise of an opponent's argument), undercutting (indicating that premises of the opponent's argument are not sufficient to justify the conclusion) and rebuttal (presenting an argument supporting conclusion contrary to the one advocated by the opponent).[25]

10) **Activities – efficacy conditions.** What conditions or factors contribute to the efficacy of activities within this process, that is, to the fact that an activity produces (intended) results? Are there time constraints, resource requirements, or specific protocols? The efficacy conditions category summarises the most important criteria on which the effectiveness of the actions taken by actors in the proceedings is dependent.

11) **Structures related to organisation and flow of activities.** Does the process contain any specific means to structure the flow of the proceedings? Three core structures are indicated. That is case files, meetings/hearings and service of documents.

12) **Structures related to fact-finding.** Are there mechanisms in place for fact-finding or evidence-gathering within this process? How are facts or evidence evaluated? What is the distribution of the burden of proof?

13) **Outcome characteristics.** Are there specific criteria for determining outcomes? In particular, how are the decisions reasoned? Are the decisions aimed primarily at regulating the situation that has already occurred or regulating the parties' relations for the future? This category corresponds to standard and most common subcategories used to characterise dispute resolution processes. The category enables the declaration of core characteristics of outcome determination in the case – most importantly, whether it is adjudicative or amicable in nature.

14) **Outcome review possibility.** This category describes core characteristics of a way in which a decision within the process may be reconsidered, especially if it is challenged. The notion of "review" should be interpreted broadly here to capture all possible situations where an outcome is subject to scrutiny, irrespective of the potential effects of this scrutiny.

15) **Enforcement of outcome.** The enforcement category describes the existence and character of means used to enforce the result of a particular dispute resolution procedure. This includes, in particular, a question about the existence of a specific procedure conclusion of which conditions the binding force of a dispute resolution process if they are not enforceable automatically.

16) **Connection to other processes.** From the modelling perspective, it may be of key interest to indicate whether, how, when and on what basis the discussed procedures interact with different procedures. Connection may stem from the law itself, but in many instances, it will be dependent on a specific decision being made by actors of the proceedings – be it the parties themselves (e.g., the decision to engage in the settlement negotiations, or to elevate the dispute to a third party ODR system) or the decision-making authority made on the request of one of the parties (e.g., in case of proceedings aimed at securing claims pursued in a main dispute, or if an adjudicative body requires the parties to attempt to settle their dispute before a mediator).

17) **Costs.** What are the cost considerations associated with conducting this process? Apart from basic categories of costs that are to be incurred by the parties, this category includes two crucial (from the perspective of day-to-day practice) considerations. First, the question of whether the particular process allows for **waivers of the costs**. The second crucial consideration pertains to the issue of **cost allocation**.

18) **Technical means supporting the process.** In this category, investigators are invited to introduce which technical means are used within the framework of the proceedings. It is crucial from the point of view of designing and developing ODR systems. The investigator may consider different communication tools and solutions supporting or (semi-) automating particular activities. Considering the technological neu-

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trality methodological principle, we foster mainly functional classification of tools in this area, for instance, document generators, document summary tools, argumentation tools, negotiation decision support systems etc. More granular classifications are possible.

19) **Assessment and evaluation internal to the justice processes.** How are the procedural and substantive aspects of this process assessed? Note that such an evaluation may be performed either in the same process or in a different (connected) process, but such activities should be relevant to the outcome of the characterised process.

20) **Assessment and evaluation external to the justice process.** How is the functioning of the process assessed and evaluated at both normative and technological levels? How is the efficacy of this process assessed? Are there performance metrics or benchmarks in place? Unlike the internal assessment described in the category above, this category does not concern substantial qualities of the dispute resolution or settlement process itself. In the external context, it is primarily a matter of assessing the key performance indicators of the justice or general dispute resolution procedures, especially from their compliance with normative requirements or their efficiency.

It should be noted that the above categories did not use any typical names of canonical dispute resolution processes such as adjudication or mediation. This is since these canonical forms are only a few among numerous options following from the combinations of the available building blocks.

5. Conclusions and Further Research

The above outlined categories delineates the relatively complete space of possible e-justice systems. Even if we were to assume that for each of the 20 categories, only two distinct options are available, this would result in more than one million potential different model justice processes. Of course, not all of them would be practically feasible, also due to the logical or pragmatic incompatibility of specific building blocks. However, the awareness of the available options is to be considered seriously, taking into account the availability of the process modelling tools and the models representing virtually any reasoning pattern, provided that it has a structure expressible in a formal language (Section 3 above). The choices made in the structural perspective would remain a crucial challenge. In the existing settings, they are either made by a lawmaker creating a given justice process (which will typically involve multiple constraints following from the existing regulation, canonical processes and the overall context of the existing legal culture) or by a private ODR provider, and thus often made ad hoc, which leads to limited scalability and strict task- and domain dependence of the developed system. The set of categories outlined above aims to contribute decisively to the structural perspective of the e-justice processes modelling by introducing an approach which is jurisdiction neutral and comprehensive at the same time. The current and upcoming availability of AI technologies[26] enabling automatization of certain activities, specifically those concerning the generation of text in response to text prompts, creates new possibilities to cover the space of possible e-justice processes by introducing previously unconsidered solutions. This is one of the most viable paths towards broadening access to justice on an unprecedented scale.

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[26] BRANTING, K., MCLEOD, S., HOWELL, S., WEISS, B., PROFITT, B., TANNER, J., GROSS, I., SHIN, D. A computational model of facilitation in online dispute resolution. In: Artificial Intelligence and Law, Vol. 31, No. 3, 465–490 (2023). ZELEZNIKOW, J. Using Artificial Intelligence to provide Intelligent Dispute Resolution Support. Group Decision and Negotiation, Vol. 30, No. 4, 789–812 (2021).