

## Conflict Resolution with Equitative Algorithms - A tool to establish a European Common Ground of Available Rights

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CONFLICT RESOLUTION WITH EQUITATIVE ALGORITHMS  
A TOOL TO ESTABLISH A EUROPEAN COMMON GROUND  
OF AVAILABLE RIGHTS

**Abstract** The current study examines the application of algorithms in resolving civil conflicts within the EU with specific focus on divorce and inheritance concerning asset division. For that purpose, this paper initially argues the applicability and advantages of deploying algorithmic conflict resolution for civil disputes, in general terms. Then, the best practices established at the global level in the United States, Canada and Australia will be discussed followed by the European approach towards the use of algorithms in resolving disputes. Next, the authors will focus on arguing how the use of the algorithmic dispute resolution method can best fit within the European context of civil dispute resolution – considering the existing inconsistencies among civil and civil procedural rules of the Member States – leading us to establish for the first time a European Common Ground of Available Rights at the EU level. Finally, this study lays out the project on Conflict Resolution with Equitative Algorithms (CREA) and looks at the results achieved through the data collection process and analysis of such data contributing towards the two major practical achievements of this project, namely developing CREA Software, which assists disputants to resolve their property division related conflicts through this online tool, and the establishment of the EU Common Ground of Available Rights framework, with the principle aim of tackling the existing inconsistencies in civil and civil procedural rules on divorce and inheritance within the EU.

***Introduction***

Algorithmic driven Artificial Intelligence (AI) is already shaping various aspects of human life from education and finance to transportation, healthcare and significant national security applications. In a like manner, the legal domain has also been experiencing the emer-

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(§ § Introduction, III & Conclusion are attributed to both authors. §§ I & II are attributed to Marco Giacalone.)

gence of AI in the legal industry. However, unlike many other areas of human life, which have been remarkably open towards accepting AI into their field, even though the research field of AI and Law dates back to the early 1980s,<sup>1</sup> the legal industry is still very slow and to some extent resistant to adopting advanced technological innovations into the world of law.<sup>2</sup>

The economist Klaus Schwab in his striking, yet alarming, book of *'The Fourth Industrial Revolution'* indicates that lawyers are not alone among the professions that will be partly or completely automated, but he also rightly emphasizes that legal proceedings will turn into automated procedures rather than generic ones.<sup>3</sup> More deliberately, Richard Susskind explicitly notes that within the next two decades there will be drastic changes in the legal world compared to the last two centuries.<sup>4</sup>

Despite all the controversies and scepticism towards the influence of a union between AI and Law on justice,<sup>5</sup> there is already evidence that the advantages outweigh the risks involved in various aspects of the legal field. These benefits have been mentioned as time-savings, and providing more precise and accurate solutions to complex legal conflicts leading to the increased satisfaction of disputants from the service experience.<sup>6</sup>

<sup>1</sup> ASHLEY, K. (2017). *Artificial intelligence and legal analytics: New tools for law practice in the digital age*. Cambridge: Cambridge University Press, p. 3.

<sup>2</sup> Law in Order: The Rise of Artificial Intelligence in Law Infographic | The Fact Site. (2019). Retrieved 15 October 2019, from <https://www.thefactsite.com/artificial-intelligence-in-law/>

<sup>3</sup> SCHWAB, K. (2017). *The fourth industrial revolution*. UK: Portfolio Penguin, pp. 39, 156.

<sup>4</sup> SUSSKIND, R. (2017). *Tomorrow's lawyers an introduction to your future* (Second ed.). Oxford: Oxford University Press, p. 17

<sup>5</sup> The most indicated issues with algorithms include discrimination and unfairness, informational privacy, opacity and transparency. See Edwards, L., & Veale, M. (2017). *Slave to the Algorithm? Why a 'right to an explanation' is probably not the remedy you are looking for*. *Duke Law & Technology Review*, *Duke Law & Technology Review*, 16 (1) pp. 18-84. (2017), pp. 27-43. Also see Mackworth, A. K. (2011). *Architectures and ethics for robots, constraint satisfaction as a unitary design framework*. In M. Anderson & S. L. Anderson (Eds.), *Machine ethics*. Cambridge: Cambridge University Press.

<sup>6</sup> PARNHAM, R. (2019). *How law firms are using AI-assisted LegalTech solutions: A conversation with Slaughter and May's Knowledge and Innovation team* [Blog]. Retrieved 19 November 2019, from <https://www.law.ox.ac.uk/unlocking-potential-artificial-intelligence-english-law/blog/2019/06/how-law-firms-are-using-legal>

One of the most commonly cited areas that AI can bring into the field of law is the application of automated intelligence to increase the efficiency of justice in both civil and criminal matters. Although at present, the discussion on implementing automated intelligence driven criminal proceedings<sup>7</sup> is more robust compared to the civil procedure, the deployment of AI in civil proceedings has not been ignored.

Accordingly, AI has been implemented in various aspects of civil procedure from case data management and legal arguments<sup>8</sup> to decision-making processes.<sup>9</sup> With regard to the possibility of using automated decision-making in the context of civil matters, the main reason driving this is the existing deficiencies, such as extremely lengthy and costly proceedings, in addition to language obstacles,<sup>10</sup> in current cross-border civil proceedings, while increasing the effectiveness of civil justice.<sup>11</sup>

At the European level, delivering an efficient justice system is considered as one of the most significant pillars of the right to a fair trial as expressly mentioned within Article 6 of the European Convention on Human Rights. Building an efficient and fair judicial system essentially demands several elements to be present. The first and most significant

<sup>7</sup> For more information on the use of AI in criminal procedures look at Berman, Donald H., & Hafner, Carole D. (1989). The potential of artificial intelligence to help solve the crisis in our legal system. (Social Aspects of Computing special section). *Communications of the ACM*, 32(8), 928-938. Also Berk, R. (2019). *Machine Learning Risk Assessments in Criminal Justice Settings*. Cham: Springer International Publishing: Imprint: Springer. Also Chun-Soo Yang. (2017). Artificial Intelligence and the Change of Legal System –In case of criminal justice–. *Korean Journal of Legal Philosophy*, 20(2), 45-76. Also Jimeno-Bulnes, M. (2017). The use of intelligence information in criminal procedure: A challenge to defence rights in the European and the Spanish panorama. *New Journal of European Criminal Law*, 8(2), 171-191.

<sup>8</sup> LEENES, R.E., & Faculty of Behavioural, Management Social Sciences. (2001). Burden of proof in dialogue games and Dutch civil procedure. *The Eighth International Conference on Artificial Intelligence and Law: Proceedings*, 109-118, p. 109.

<sup>9</sup> EDWARDS, L., & VEALE, M. (2017). Slave to the Algorithm? Why a 'right to an explanation' is probably not the remedy you are looking for. *Duke Law & Technology Review*, *Duke Law & Technology Review*, 16 (1) pp. 18-84. (2017), p. 19.

<sup>10</sup> STADLER, ASTRID, & ERASMUS SCHOOL OF LAW. (2013). Practical Obstacles in Cross-Border Litigation and Communication between (EU) Courts. *Erasmus Law Review*, 5(3), 151-168, p. 153.

<sup>11</sup> CORRALES, M., FENWICK, M., & FORGÓ, N. (2018). *Robotics, AI and the Future of Law (Perspectives in Law, Business and Innovation)*. Singapore: Springer Singapore: Imprint: Springer, p. 11.

component to consider is to analyse the extent to which a judicial system deals with cases within a reasonable amount of time. Referring to the legal maxim of “*to delay justice is injustice*”<sup>12</sup> indicates the significance of this component in facilitating a just procedure in legal systems.

The next element refers to the cost of civil proceedings which is clearly recognized as a serious obstacle hindering effective access to justice for citizens. Linguistic diversity is another practical issue within the European context that restricts the right to have access to justice at the cross-border level.<sup>13</sup> Despite citizens’ access to translation and interpretation services as a solution to language challenges, this imposes considerable costs on EU citizens.<sup>14</sup>

Furthermore, the current legal systems underestimate the potential and value of possibilities to reach an amicable agreement between disputants. Instead, courts merely rely on judicial solutions. This existing exaggerated focus of the European jurisdictions on resolving disputes through the ordinary judicial proceedings highly disregards the disputants’ desires and needs in the process of conflict resolution.

Taking into account the long-pursued goal of the EU Commission to reinforce the European Digital Single Market (DSM) and increase consumers’ contributions to this market, harmonization of civil procedural rules at the EU level seems essential to guarantee the proper functioning of the EU DSM.<sup>15</sup> Despite the current efforts of EU Member States in developing national legal systems of civil justice, the existing inconsistencies demonstrate that the solutions have not often been sufficiently coherent in tackling the very slow and inefficient access to justice, in particular at the supranational level.<sup>16</sup>

<sup>12</sup> BÓKA J. (2014) ‘To Delay Justice Is Injustice’: A Comparative Analysis of (Un)reasonable Delay. In: Badó A. (eds) Fair Trial and Judicial Independence. Ius Gentium: Comparative Perspectives on Law and Justice, vol 27. Springer, Cham

<sup>13</sup> MELLONE M. (2014) Legal Interoperability in Europe: An Assessment of the European Payment Order and the European Small Claims Procedure. In: Contini F., Lanzara G. (eds) The Circulation of Agency in E-Justice. Law, Governance and Technology Series, Springer Dordrech 13, 245-264, p. 257.

<sup>14</sup> ONTANU, E., & PANNEBAKKER, E. (2012). Tackling Language Obstacles in Cross-Border Litigation: The European Order for Payment and the European Small Claims Procedure Approach. *Erasmus Law Review*, 5(3), 169-186, p. 169.

<sup>15</sup> A strong and united Europe that reflects European values and thrives globally in an open economy - DIGITALEUROPE. (2019). Retrieved 16 October 2019, from <https://www.digitaleurope.org/resources/a-strong-and-united-europe-that-reflects-european-values-and-thrives-globally-in-an-open-economy/>

<sup>16</sup> SILVESTRI E. (2014) Goals of Civil Justice When Nothing Works: The Case of

In this article, the authors argue that the proposed model of Conflict Resolution with Equitative Algorithms (CREA)<sup>17</sup> has the potential to function as a pragmatic alternative solution for resolving cross-border (also, national) civil disputes to increase the efficiency of justice.

The specific focus of this study is divorce and inheritance conflicts. The main reason for selecting these two subject matters refers, on the one hand, to their direct link with the element of distribution of property among two or more individuals. On the other hand, they were chosen due to the immense significance of reaching a proportional and envy-free property division in the process of divorce and inheritance to provide satisfaction for every participant involved by receiving the largest possible portion of goods divided. Therefore, CREA was established on the basis of the point-allocation procedure, estate and divorce property distribution being ideal candidates for the purpose of this study.

The main contribution of the current paper is to introduce the CREA project – that eventually resulted in developing the CREA software in addition to establishing for the first time the EU Common Ground of Available Rights in the EU – as a new establishment of access to justice providing new insights into a privatized and non-judicial model of dispute resolution. This proposed method can be used as a helpful tool for people who are involved in the judiciary, including judges and lawyers and also non-judicial experts such as negotiators and mediators. More significantly, this tool can also be used directly by disputants independently in order to reach an agreement among themselves, taking control over the process of resolving their conflict, without the necessity of referring to the court.<sup>18</sup>

Hence, in the current study, the research question is:

*'How does CREA – as an algorithmic-driven model of dispute resolution – contribute towards tackling the problem of legal inconsistencies among the EU jurisdictions on civil matters through establishing the Eu-*

Italy. In: Uzelac A. (eds) *Goals of Civil Justice and Civil Procedure in Contemporary Judicial Systems. Ius Gentium: Comparative Perspectives on Law and Justice*, vol 34. Springer, Cham, pp. 79-80.

<sup>17</sup> CREA project, funded by the EU Commission, began in 2017 for a period of two years focusing on investigating into establishing an effective decision support system in resolving disputes through implementing the equitable algorithms. CREA tool functions as a service for the disputants assisting them to reach to an amicable settlement.

<sup>18</sup> <http://www.crea-project.eu>. Retrieved 19 November 2019.

*ropean Common Ground of Available Rights? Furthermore, to what extent does this establishment assist the parties to gain access to efficient justice for their cross-border civil disputes?’*

In order to answer the above research questions, this study first argues for the algorithm’s compatibility for being used in the context of resolving civil disputes. To provide a more in-depth insight into this matter, the practice of algorithmic civil dispute resolution and the leading existing examples of the use of AI for division of assets in the United States, Canada and Australia will be briefly discussed. Then, the implementation of algorithmic dispute resolution in the EU will be analysed accordingly. The study therefore reviews the CREA project followed by highlighting the creation of CREA software and also the significance of establishing the EU Common Ground of Available Rights as the two major achievements of this project. Drawing on the previous section, the results of the investigation into several selected EU Member States’ legislations concerning divorce and inheritance will be presented.

## **I. Literature Review**

### **1. Definition of Terms**

In understanding the meaning of the technical terms used in the course of analysing the applicability of AI, algorithms and automated decision systems (ADS), the vital first step is to provide a precise definition of these terms for readers. Hence, this section of the article clarifies exactly what is meant by these concepts.

#### **a) Artificial Intelligence (AI)**

No clear consensus exists over a precise and universal definition of Artificial Intelligence (AI) among scholars.<sup>19</sup> Despite the lack of an explic-

<sup>19</sup> For more information see *Machines Who Think*. (1991). *Science*, 254(5036), 1291. Also Simon, Herbert A., & Munakata, Toshinori. (1997). AI lessons. (artificial intelligence; IBM’s Deep Blue chess computer). *Communications of the ACM*, 40(8), 23. Also Boden, M. (1996). *Artificial intelligence (Handbook of perception and cognition (2nd ed.))*. San Diego: Academic Press. Also Rich, E. (1983). *Artificial intelligence (McGraw-Hill series in artificial intelligence)*. New York: McGraw-Hill. Also Nilsson, N., & SRI International. Computer Science Technology Division. (1974). *Artificial intelligence (Technical note (SRI) ; 89)*. Menlo Park, Calif.: Artificial Intelligence Center, SRI International. Also Graham, N. (1979). *Artificial intelligence*. Blue Ridge Summit, Pa.: Tab Books. Also Lawrence, D., Palacios-González, C., & Harris, J.

it clarification about the term AI, this field has grown tremendously and enhanced in various aspects. Nonetheless, it appears that the most highly favoured definition is provided by Nils J. Nilsson who defines AI as:

*“the activity devoted to making machines intelligent, and intelligence is that quality that enables an entity to function appropriately and with foresight in its environment”*.<sup>20</sup>

According to the definition provided by Nilsson, AI is defined as a credit incorporated into a software and hardware system to make its functionality appropriate while having considerable foresight depending on the environment of its applicability,<sup>21</sup> which in this article is the legal context.

#### **b) Algorithmic Decision-making System (ADS)**

From the technical perspective, an algorithm is defined as any procedure with the potential to be carried out automatically.<sup>22</sup> This definition is too broad<sup>23</sup> to provide us with an elaborate definition of an algorithm. Although currently there is no generally acknowledged formal definition of an algorithm among scholars, nevertheless the European Ethical Charter on the use of artificial intelligence (AI) in judicial systems defines it as:

*“Finite sequence of formal rules (logical operations and instructions) making it possible to obtain a result from the initial input of information. This sequence may be part of an automated execution process and draw on models designed through machine learning.”*<sup>24</sup>

Despite differences of opinion on the definition of an algorithm, there appears to be some agreement that an algorithm refers to a list of rules that are automatically followed in a phased sequence in order to resolve a problem.<sup>25</sup>

(2016). Artificial Intelligence. Cambridge Quarterly of Healthcare Ethics, 25(2), 250-261. Also Winston, P. (1977). Artificial intelligence (Addison-Wesley series in computer science). Reading, Mass.: Addison-Wesley Pub. Also Ennals, J. (1987). Artificial intelligence (State of the art report; 15:3). Maidenhead: Pergamon Infotech.

<sup>20</sup> NILSSON, N. (2010). The quest for artificial intelligence (1st ed.). Cambridge: Cambridge University Press.

<sup>21</sup> STONE, P. et al. (2016). Artificial Intelligence and Life in 2030: One Hundred Year Study on Artificial Intelligence. Stanford University.

<sup>22</sup> CHABERT, J., & BARBIN, E. (1999). A history of algorithms. Berlin: Springer, p. 2.

<sup>23</sup> Supra note 9, p 24.

<sup>24</sup> The European Ethical Charter on the use of artificial intelligence (AI) in judicial systems and their environment, adopted at the 31st plenary meeting of the CEPEJ (Strasbourg, 3-4 December 2018), Council of Europe, February 2019, p. 69.

<sup>25</sup> DOMINGOS, P. (2015). The master algorithm (1st ed.). New York: Basic Books, p. 1.



During the course of this study, by referring to the algorithmic decision-making systems, the authors mean a model of dispute resolution that functions in the course of a procedure to make a decision by using algorithms without any human intervention in the entire decision-making process. The ADS has been widely used already in various areas from medicine and industry to finance and banking. In the legal context, the ADS is already being implemented within judicial enforcement and criminal justice in predictive and preventive capacities, such as delivering decisions to assist police in identifying whether a crime suspect is high-risk for being released.<sup>26</sup>

In terms of using ADS in civil law, Family\_Winner by John Zeleznikow and Emilia Bellucci in Australia, SmartSettle in Canada and Adjusted-Winner in the United States are among the most prominent examples of using algorithms to resolve civil conflicts specifically to divide property under dispute.

Nevertheless, before going on to discuss the implementation of some algorithmic models of civil dispute resolution in non-European jurisdictions, it is necessary to explain the compatibility of using algorithms for resolving (cross-border) civil conflicts.

## ***2. The Algorithms' Compatibility in Resolving Civil Disputes***

Judicial decision making in civil law related matters not only requires the judge to have logical reasoning in the legal context, but also to be endowed with a synergetic collection of research, language, creative problem-solving and social skills capabilities in order to be able to deliver a competent judgment. Taking into account what Richard Posner stated in his notable book of *'How Judges think'*, that even judges at the highest level of expertise, who are working in the appeal or supreme courts, are at the risk of their judgments being influenced by their experiences, temperament and personal characteristics instead of in-depth legal reasoning.<sup>27</sup>

Nevertheless, in responding to the above-mentioned limitations to human-delivered judgments, the algorithmic dispute resolution model can be used as a complementary tool to the work of judges (and also

<sup>26</sup> MARSH, S. (2019). UK police use of computer programs to predict crime sparks discrimination warning. Retrieved 20 October 2019, from <https://www.theguardian.com/uk-news/2019/feb/03/police-risk-racial-profiling-by-using-data-to-predict-reoffenders-report-warns>

<sup>27</sup> POSNER, R. (2008). *How judges think*. Cambridge, Mass.: Harvard University Press.

arbitrators, mediators, negotiators or even disputants *per se*) in order to assist them in overcoming human-based errors, sometimes occurring unintended, in the process of decision-making, providing the highest possible precision and correctness.<sup>28</sup>

In resolving civil conflicts, cases involving the element of the division of assets are ideal candidates to apply ADS. The most noticeable feature is the intelligence laid down in algorithms. This ability can provide solutions in an instant and much more comprehensive manner compared to the human decision-maker.<sup>29</sup> Moreover, ADSs retain the distinctive feature of storing a tremendous amount of laws and regulations and use them in the course of processing data to reach the most suitable and appropriate decision as an output. In the European context, considering the existing disparities among the national legal systems and lack of adequate harmonization in this aspect, specifically regarding asset division in cross-border civil disputes, the use of such an international and comprehensive model of dispute resolution is a considerable advantage to be implemented at the EU level.

Taken together, it is also significant to point out the possible risks of using algorithms in the process of legal decision-making. To be more specific, risks are associated with the issue of transparency, discrimination, bias, quality, security and the system remaining under the control of the user during the entire decision-making process<sup>30</sup>, though discussing them is beyond the scope of this paper.<sup>31</sup>

## **II. Using Algorithms for Resolving Civil Disputes – A Global Perspective**

### **1. The United States**

The emergence of the fair division theory in the United State dates back to 1948, when the mathematician Hugo Steinhaus and his re-

<sup>28</sup> DANZIGER, S., LEVAV, J., & AVNAIM-PESSE, L., (2011). Extraneous factors in judicial decisions. *Proceedings of the National Academy of Sciences*, 108(17), 6889-6892.

<sup>29</sup> Machine, Platform, Crowd: Harnessing Our Digital Future, by Andrew McAfee and Erik Brynjolfsson. (2017). *Times Higher Education*, p. *Times Higher Education*, Jul 27, 2017, Issue 2316.

<sup>30</sup> The European Ethical Charter on the use of artificial intelligence (AI) in judicial systems and their environment, 2019, p. 7.

<sup>31</sup> For more information see EPIA. (2019). *Progress in Artificial Intelligence: 19th EPIA Conference on Artificial Intelligence*, 3-6 September 2019, Vila Rea, Portugal.

search fellows raised the question of fair division in cases where there are more than two individuals involved. Since then, there have been several other studies focused on fair division issues, however, they all encountered some complexities, such as the limited application of this procedure to four agents as well as the difficulty of reaching an envy-free allocation of goods compared to proportional allocation.<sup>32</sup>

Unlike previous studies conducted on fair division techniques, the procedure developed by Steven Brams and Alan Taylor known as ‘Adjusted Winner (AW)’ in 1996 and 1999<sup>33</sup> brought significant attention to dividing assets in a more precise and fair manner. The AW entails various interesting features, including envy-freeness, efficiency and equitability to achieve a just division through the use of algorithms.<sup>34</sup> This algorithmic procedure is founded on the basis of game theory techniques and division theory.<sup>35</sup> The AW became the preferred procedure to be used for the allocation of several divisible assets between two individuals in a dispute.<sup>36</sup>

This rich theoretical and mathematical framework developed by Brams and Taylor was advocated as a pioneering procedure in resolving eligible disputes such as political issues, international border conflicts, water conflicts and some legal issues, explicitly in the division of assets within divorce and inheritance.<sup>37</sup>

Despite the efficiency of the fair division procedure’s implementation in the judicial context, it has been under-used in this sector.

In line with efforts to indicate more implementations of algorithms in splitting assets, in 2001 Brams and Kilgour introduced the fallback bargaining concept.<sup>38</sup> According to fallback bargaining, the parties involved

<sup>32</sup> BRAMS, S., & TAYLOR, A. (1996). *Fair Division: From Cake-Cutting to Dispute Resolution*. Cambridge: Cambridge University Press, p. 30.

<sup>33</sup> BRAMS, S., & TAYLOR, A. (1999). *The win-win solution*. New York: W.W. Norton.

<sup>34</sup> MASSOUD, T. (2000). Fair Division, Adjusted Winner Procedure (AW), and the Israeli-Palestinian Conflict. *Journal of Conflict Resolution*, 44(3), 333-358, p. 333.

<sup>35</sup> BELLUCCI, E., LODDER, A., & ZELEZNIKOW, J. (2004). Integrating artificial intelligence, argumentation and game theory to develop an online dispute resolution environment. 16th IEEE International Conference on Tools with Artificial Intelligence, 749-754, p. 752.

<sup>36</sup> The Adjusted Winner Procedure is currently operated under the Fair Outcomes, Inc at <https://www.fairoutcomes.com/fd.html>. For deeper insight into the function of the AW Procedure visit <http://www.nyu.edu/projects/adjustedwinner/>. Retrieved 19 November 2019.

<sup>37</sup> AZIZ, H., BRÂNZEI, S., FILOS-RATSIKAS, A., & FREDERIKSEN, S. (2015). The Adjusted Winner Procedure: Characterizations and Equilibria, pp. 1-2.

<sup>38</sup> BRAMS, S., & KILGOUR, J. (2001). Fallback Bargaining. *Group Decision and Negotiation*, 10(4), 287-316.

in division initiate the procedure by stating their order of preference for the existing alternatives. Subsequently, they fall back to the least preferred items beginning with their first choices and adding the second and so on, until all individuals reach an item which they all agree upon.

During recent decades, various legal applications of algorithmic fair division such as Cybersettle<sup>39</sup> and SquareTrade<sup>40</sup> were established in the United States. Although not all of these service providers are currently as active as in the past in procuring algorithmic dispute resolution services, some of them are still actively operating in this field.

One of the most remarkable automated dispute resolution service providers was Modria, founded in 2011 by Colin Rule, providing the initial online dispute resolution platform to PayPal and eBay with regard to automated dispute resolution with limited human intervention in the procedure. However, later, Modria offered comprehensive online dispute resolution services to public agencies such as courts and tax-related corporations. Following the successful operation of Modria, this platform was finally acquired by TylerTech Corporation in 2017 aiming at developing justice solution services.<sup>41</sup>

## 2. Canada

Similarly, in Canada the Ministry of Justice of British Columbia thoroughly investigated the use of algorithms in dispute resolution, leading to the establishment of the Civil Resolution Tribunal (hereinafter, CRT)<sup>42</sup>, in 2011. The CRT was offered as an alternative tool to the ordinary court proceedings by British Columbia Consumer Protection Centre using a Modria-based online dispute resolution system for settling disputes between consumers and businesses in British Columbia (BC).<sup>43</sup>

<sup>39</sup> Cybersettle. (2019). Retrieved 4 September 2019, from <http://www.cybersettle.com/>.

<sup>40</sup> SquareTrade Protection Plans - Extended Warranties - About Us. (2019). Retrieved 4 September 2019, from <https://www.squaretrade.com/about-us>.

<sup>41</sup> Relations, I. (2019). Tyler Technologies Acquires Modria. Retrieved 5 September 2019, from [https://tylertech.irpass.com/Tyler\\_acquires\\_Modria](https://tylertech.irpass.com/Tyler_acquires_Modria).

<sup>42</sup> For more information see Home - Civil Resolution Tribunal. (2019). Retrieved 12 November 2019, from <https://civilresolutionbc.ca/>.

<sup>43</sup> RAYMOND, ANJANETTE H., & SHACKELFORD, SCOTT J. (2014). Technology, ethics, and access to justice: Should an algorithm be deciding your case? *Michigan Journal of International Law*, 35(3), 485-524, p. 505.

Nevertheless, the successful implementation of such systems led the BC government to pass the Civil Resolution Tribunal Act (CRTA), in 2012, aiming at the mandatory application of algorithms and alternative dispute resolutions to improve access to justice for provincial residents regarding their small claims and residential property disputes through an expedited, economical, informal and flexible communication mechanism. In 2015, the CRTA was amended, aiming at extending its jurisdiction to the majority of small claims up to 5,000 CAD as well as Strata disputes of any value, traffic incidents and injury claims up to 50,000 CAD. In addition, disputes arising from societies and cooperative associations of any value are eligible to use this ODR service within the BC province.<sup>44</sup>

Another prominent example of a dispute resolution service provider is SmartSettle<sup>45</sup> founded by Ernest M. Thiessen, the president of iCan Systems Inc.<sup>46</sup> SmartSettle assists conflicting parties to resolve existing negotiating challenges between them, through using a set of algorithmic tools. This procedure enables the parties to take control over the process of resolving their conflicts through identifying their interests and arrangements. This tool is precisely focused on recognizing each party's satisfaction and enabling them to reach their most favourable solutions as a win-win outcome.<sup>47</sup>

### **3. Australia**

In like manner, over the last two decades, the use of algorithms in resolving disputes has gained the attention of legal experts in Australia. In 1995, John Zeleznikow and Stranieri explored and discussed the distribution of properties through using data mining within the legal domain under Australian laws.<sup>48</sup> This research was conducted in the

<sup>44</sup> SHANNON, S. (2017). Online Dispute Resolution and Justice System Integration: British Columbia's Civil Resolution Tribunal. *Windsor Yearbook of Access to Justice*, 34(1), 112-129, pp. 117-120.

<sup>45</sup> Smartsettle complies with Canadian anti-spam laws – iCan Systems Inc. (2019). Retrieved 10 November 2019, from <https://smartsettle.com/2014/06/13/consent/>

<sup>46</sup> <https://smartsettle.com/about-us/ernest-m-thiessen-peng-phd/> Retrieved 19 November 2019.

<sup>47</sup> *Supra* note 35, pp. 752-753.

<sup>48</sup> ZELEZNIKOW, J., STRANIERI, A., & GAWLER, M. (1995). Project report: Split-Up? A Legal Expert System which determines property division upon divorce. *Artificial Intelligence and Law*, 3(4), 267-275. Also see Stranieri, A., & Zeleznikow, J.

context of a project called ‘Split-UP’, in which they used data collected from cases in the Australian Family Court that dealt with the division of assets following divorce between couples. The main objective of this project was to predict the percentage each conflicting party receives as his/her allocation in property distribution based on a judge’s decision in the Family Court.<sup>49</sup>

Another significant model for using algorithms in dispute resolution is the programme developed by Zeleznikow and Bellucci known as ‘Family\_Winner’.<sup>50</sup> This system functions by using a range of artificial intelligence and game-theory techniques to provide advice to disputants about possible compensation strategies.<sup>51</sup> Family\_Winner does not utilize any decision analysis, instead it only provides the parties with advice in the area of Australian Family Law, explicitly in assisting divorcing couples in defining their interests in negotiation.<sup>52</sup>

Interestingly, Zeleznikow defines the role of these intelligent systems in the context of assisting self-represented litigants in courts regarding the property division process.<sup>53</sup> Nonetheless, the necessary point to consider is that, even though applying algorithms to resolve disputes has existed for more than two decades in Australia, these systems have had limited judicial or commercial use. Whereas, algorithmic dispute resolution systems such as Family-Winner or Split-Up

(2005). *Knowledge Discovery from Legal Databases* (Vol. 69, Law and Philosophy Library). Dordrecht: Springer Netherlands.

<sup>49</sup> ZELEZNIKOW, J. (2004). The Split-up project: Induction, context and knowledge discovery in law. *Law, Probability and Risk*, 3(2), 147-168, p. 147.

<sup>50</sup> It is necessary to point out that after the introduction of Family\_Winner software, this tool received considerable attention from the investors to commercialise it. See Lodder, A., & Zeleznikow, J. (2010). *Enhanced dispute resolution through the use of information technology*. Cambridge: Cambridge University Press, p. 116.

<sup>51</sup> ZELEZNIKOW, J. AND BELLUCCI, E. (2003) *Family\_Winner: Integrating Game Theory and Heuristics to Provide Negotiation Support*. In: *Legal knowledge and information systems: JURIX 2003: the sixteenth annual conference*. Bourcier, Danièle, ed. *Frontiers in artificial intelligence and applications*. IOS Press, Amsterdam, 21-30, pp. 21-22.

<sup>52</sup> BELLUCCI, E. & ZELEZNIKOW, J. (2005). Developing Negotiation Decision Support Systems that Support Mediators: A Case Study of the Family\_Winner System. (Author abstract). *Artificial Intelligence and Law*, 13(2), 233-271, pp. 233 and 266-267.

<sup>53</sup> ZELEZNIKOW, J. (2017). Can Artificial Intelligence and Online Dispute Resolution enhance efficiency and effectiveness in Courts. *International Journal for Court Administration*, 8(2), 30-45, p. 42.

have considerable potential for assisting courts in dealing with sophisticated matrimonial property division cases.<sup>54</sup>

### **III. *Algorithmic Dispute Resolution in the EU***

#### **1. *Current issues: the necessity for improving access to efficient justice***

Currently, to resolve a civil dispute, a citizen must spend a considerable amount of money to be able to seek justice for his/her claim. Moreover, the time for trial proceedings is too long in the majority of EU Member States. As an example, in Italy the length of civil proceedings is so long that in many cases it may take several years to get a judgment from the court of first instance and appeal tribunals. Next comes Greece and Malta with lengthy proceedings for resolving civil disputes within their jurisdictions.<sup>55</sup>

This scenario is even worse in the case of cross-border civil disputes. In addition to huge trial costs and long trials, the considerable disparities between the laws of Member States and language barriers play a significant role in hindering efficient justice for EU citizens at the Community level. These hurdles are in obvious contradiction to the EU's emphasis on the further transnational economy boost of the EU Internal Market, since such obstacles have had a negative influence on the trust of consumers to actively contribute to the Market.<sup>56</sup>

Furthermore, one of the major complexities many citizens confront in striving to seek justice in their cross-border civil disputes, is to find the competent forum that has jurisdiction over the case. Assuming the citizen is a lay person with zero to very limited legal knowledge, it is extremely difficult to overcome these complications with no expert help. As a result, the citizen must seek legal assistance through hiring a lawyer which costs him/her a remarkable amount of money, aside from the trial and translation fees for the proceedings.<sup>57</sup>

<sup>54</sup> BURSTYNER, N., SOURDIN, T., LIYANAGE, C., OFOGHI, B., & ZELENKOW, J. (2018). Using Technology To Discover More About The Justice System. *Rutgers Computer & Technology Law Journal*, 44(1), 1, p. 13.

<sup>55</sup> European Commission (2018). The 2018 EU Justice Scoreboard. COM (2018) 364 final. Brussels :European Commission, pp. 10-12.

<sup>56</sup> CORTÉS, PABLO, & CORTÉS, P. (2016). The New Regulatory Framework for Consumer Dispute Resolution. Oxford University Press, pp. 450-451.

<sup>57</sup> STORSKRUBB, EVA, & STORSKRUBB, E. (2008). *Civil Procedure and EU Law: A*

The enforcement of the judgment in a foreign country with a different language and alien rules is also very tricky and complicated for a lay citizen.

Given these points, the existing legal systems do not adequately appreciate the possibility of reaching an amicable agreement between disputants. In contrast, they constantly try to resolve civil disputes through resorting to usually burdensome, costly and long-lasting court trials.

In a Report adopted by the CEPEJ at its 8<sup>th</sup> preliminary meeting in Strasbourg in December 2006<sup>58</sup>, the following factors were identified as the main causes of delayed justice in courts; they can be divided into two categories of pre-trial and trial-stage obstacles.

With respect to pre-trial complexities, various major reasons are taken into account by the Report, such as the territorial distribution of court jurisdiction, transfer of judges, inadequate number of judges, systematic use of multi-member tribunals, backlog of cases, complete inactivity by judicial authorities and systematic shortcomings in procedural rules, all causing lengthy court proceedings in EU national jurisdictions.<sup>59</sup>

The other category considers the causes of lengthy trials from initiation to the end of the court procedure. Among these grounds, failure to summon parties or witnesses, unlawful summons, late entry into force of legislation, controversies about jurisdiction and competency between administrative and judicial authorities and delays in transmitting the case file to the court of appeal can be mentioned as major obstacles in dealing with court claims in a more expedited manner.<sup>60</sup>

One should note that the consequences of long trials can simply be conveyed by the expression “justice delayed is justice denied” for EU citizens. These existing hurdles to seeking justice is in contradiction with the right to have access to an effective remedy as stipulated in Article 47 in the Charter of Fundamental Rights of the European Union.<sup>61</sup>

As discussed earlier, the present extreme disparities among EU

Policy Area Uncovered. Oxford University Press, p. 183. Also see Storskrubb, E. (2016). Alternative dispute resolution in the EU: Regulatory challenges. *European Review of Private Law*, 24(1), 7.

<sup>58</sup> European Commission for The Efficiency of Justice (CEPEJ), Length of court proceedings in the member states of the Council of Europe based on the case law of the European Court of Human Rights by Ms Françoise Calvez. This report has been adopted by the CEPEJ at its 8th plenary meeting in Strasbourg, 6-8 December 2006.

<sup>59</sup> Ibid, p. 5.

<sup>60</sup> Ibid.

<sup>61</sup> Charter of Fundamental Rights of the European Union, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:12012P/TXT>, Retrieved 19 November 2019.



Member States in civil and civil procedural laws, along with different languages, have acted as a serious obstacle for citizens to resolve their cross-border civil disputes in foreign courts.

Given the above-mentioned facts, there is a strong need, at the EU Community level, for establishing efficient methods of cross-border civil dispute resolution. Such methods not only protect citizens against issues such as long trials, language barriers and extreme costs, but also provide them with the most effective justice through out of court agreements. There can be a double emphasis on settling civil disputes through alternative non-judiciary means of conflict resolution considering the concept of ‘de-judicialization’<sup>62</sup> of disputes.

To this end, the use of technology in resolving conflicts with the aim of promoting the efficiency of justice has received more attention from researchers during the last decade. Furthermore, the ever-fast-growing digital transformations in Europe have also worked as a trigger to push the EU Member States towards initiating digital justice plans to provide their citizens with more convenient access to justice.

The European Commission for the Efficiency of Justice (CEPEJ), within study No. 26 on analysing the current state of developments concerning the use of Information Technology (IT) in justice at the EU level, has identified artificial intelligence as not only capable of re-thinking justice, but also of delivering much efficient justice through private providers, instead of States. Additionally, this study suggests that this model of dispute resolution benefits citizens by generating competition among private operators of justice providers which could result in producing more effective justice without unnecessary demands on the public services of the courts.<sup>63</sup>

Several Member States have already developed advanced e-justice programmes using technology to provide legal support.<sup>64</sup> For instance, in 2017, the Courts of Appeal in the region of Douai and Rennes in France tested a software programme called ‘Predictive Justice’ by judges in civil and criminal matters while evaluating its compatibility with the needs of

<sup>62</sup> LOURENCO, R.P., FERNANDO, P. AND GOMES, C. (2016). From eJustice to Open Judiciary: An Analysis of Portuguese Experience. In *Achieving Open Justice through Citizen Participation and Transparency* (pp. 111-136). Hershey, PA, USA: IGI Global, pp. 125-126.

<sup>63</sup> *Systèmes judiciaires européens –Efficacité et qualité de la justice*, ed. 2018 (données 2016) Etudes de la CEPEJ N° 26 . p. 219.

<sup>64</sup> KRAMER, X. E. (2016). Access to Justice and Technology: Transforming the Face of Cross-Border Civil Litigation and Adjudication in the EU (January 1, 2016). in: Karim Benykhlef, Jane Bailey, Jacquelyn Burkell and Fabien Gelinat (Ed), *eAccess to Justice* (University of Ottawa Press 2016), p. 351-375, p. 352.

citizens in resolving disputes.<sup>65</sup> Similarly, the Austrian justice system has applied AI with the aim of automating the anonymization and recognition of metadata in court judgments and preparing such decisions to be published in the Judiciary Legal Information System. To this end, the AI tool analyses the decision documents and extracts the metadata, recognizes natural and legal entities with their details, also anonymizes the personal data of parties while preserving the comprehensibility of the case. It has been claimed that integrating AI into the Austrian judiciary system will potentially establish strong links between the courts' decisions and create judicial coherency in terms of decision-making.<sup>66</sup>

Despite all these efforts, such initiatives have been limited to local tests at the national level and research conducted by various academic institutions, however, none of these establishments have implemented them broadly at the EU level, at least not yet.<sup>67</sup>

However, it is important to point out that all these efforts to provide citizens with convenient access to justice through the application of algorithms in dispute resolution are primarily established on the basis of the existing need at the cross-border level. Investigating reasons for using AI in dispute resolution points us to the existing inefficiencies, which were discussed earlier, in judicial dispute resolutions that are burdensome for EU citizens seeking justice.

Returning to the concept of the de-judicialization of cross-border civil disputes at the EU level, this can be simply achieved through using algorithms for resolving such claims instead of going to the judiciary. As noted previously, the successful experiences of countries such as the United States, Canada and Australia in using algorithms for resolving civil disputes prove the happy union between technology and law has the potential to bear fruit in efficient access to justice.

In the case of the EU, considering the 28 Member States with independent and sometimes extremely different rules, there is a high necessity for establishing a uniform set of rules to protect EU citizens and grant

<sup>65</sup> Commission européenne pour l'efficacité de la justice (CEPEJ) – Charte éthique européenne d'utilisation de l'intelligence artificielle dans les systèmes judiciaires et leur environnement, 2019, p. 14.

<sup>66</sup> STAWA, GEORG (2018). How is Austria approaching AI integration into judicial policies?, A presentation from the president of CEPEJ and the head of Department for Strategy, Organisational Consulting and Information Management, in Federal Ministry for Constitution, Reforms, Deregulation and Justice in Austria. Available at: <https://rm.coe.int/how-is-austria-approaching-ai-integration-into-judicial-policies-/16808e4d81>. Retrieved 19 November 2019.

<sup>67</sup> Supra note 65.

them the most convenient and efficient access to justice regarding their transnational civil disputes. The use of algorithms in resolving conflicts can constitute a very compatible solution to this challenge.

However, to date, there has been a serious lack of implementation of an algorithmic dispute resolution model to assist EU citizens in settling their civil conflicts through a fair, expedited and cost-efficient option using algorithms.<sup>68</sup>

## ***2. CREA – Using Algorithms to Resolve (cross-border) Civil Disputes in the EU***

The CREA project<sup>69</sup> aims to introduce a new mechanism for settling disputes as an assisting tool in legal procedures for lawyers, mediators and judges with the objective to reach an agreement between the parties. Moreover, this mechanism could be used directly by citizens. This new procedure has the potential to streamline national and cross-border civil proceedings. The ultimate goal of CREA is to remove the existing differences among all EU countries caused by various national laws.

To be more precise, the CREA project achieves its objectives through several stages. The first and most remarkable step is to apply algorithms in resolving certain national and cross-border civil matters in the allocation of goods or the resolution of issues leading the parties to reach an amicable solution before or during the trial stages. For that purpose, the project has primarily focused on demonstrating the efficacy of using an algorithmic approach to resolve civil disputes. To denote such efficiency, new areas in which specifically the concept of ‘Adjusted Winner’ or other algorithms were tried out, beginning with negotiations involving easily specific issues or well-defined good common property. For instance, disputes in which parties contest the inheritance of common property or the division of marital assets in a divorce settlement are among the most compatible candidates to be settled through algorithmic dispute resolution programmes.<sup>70</sup>

The next measure is to develop new algorithms with the aim of dis-

<sup>68</sup> CORTES, P. (2011). *Online dispute resolution for consumers in the European Union* (Routledge research in IT and E-commerce law). London; New York, N.Y.: Routledge.

<sup>69</sup> For more information see CREA Project. (2019). Retrieved 5 September 2019, from <http://www.crea-project.eu/about/overview/>.

<sup>70</sup> BARNETT, J., & TRELEAVEN, P. (2018). Algorithmic Dispute Resolution—The Automation of Professional Dispute Resolution Using AI and Blockchain Technologies. *The Computer Journal*, 61(3), 399-408, p. 400.

tinguishing available rights (*droits disponibles*) from national mandatory rules (*loi de police*) in force, in the different EU Member States.<sup>71</sup>

Another initiation by the CREA project which should be considered as a pioneering model in the EU, up to the present time, is to establish a “European Common Ground of Available Rights (ECGARs)”, different from standard legal principles, by developing and using algorithms that rapidly implement better settlements. To this end, the principal focus of the CREA project’s Consortium lies within the available rights in divorce and inheritance in several selected Member States.<sup>72</sup>

The last and very practical stage of the CREA project refers to advancing software in which the selected harmonized procedures, applicable in all the EU States, will not infringe upon or conflict with national regulations. This software has the potential to be integrated into the European e-Justice portal<sup>73</sup> and the EU-ODR platform.<sup>74</sup>

The CREA project deploys an entirely bottom-up approach, thus the parties determine the model of dispute settlement which is compatible with their interests in order to reach a final solution for the division of common property. To achieve this goal, the project endorses the theoretical premises of decision theory studies in this regard.

At the final stage of the project, CREA software assists judges and lawyers to establish the legal procedure not as a confrontation between the parties’ positions, but as a process which is aimed at helping disputants to reach an amicable consensual agreement over their conflicts. In the CREA approach, judges and lawyers do not play the role of rule enforcers or even solution makers. They act more in the capacity of mere assistants to disputants in aiding them with reaching their own solutions about the conflict; a solution which is fair, envy-free and satisfactory for all parties. This new approach is a remarkable innovation introduced and developed by the CREA project for the first time in the EU.

It can therefore be observed that the ultimate beneficiaries of this approach are the EU citizens who can use this process to foster their effective access to justice without having to seek it by resorting to cost-

<sup>71</sup> GIACALONE, M. (2016). *Dispute Resolution and New IT Realities* (Ph.D.). University of Naples Federico II/Vrije Universiteit Brussel, p. 195.

<sup>72</sup> These EU countries include: Belgium, Croatia, France, Greece, Italy, Lithuania and Slovenia.

<sup>73</sup> European E-Justice. (2019). Retrieved 4 September 2019, from <https://e-justice.europa.eu/home.do>.

<sup>74</sup> Online Dispute Resolution | European Commission. (2019). Retrieved 4 September 2019, from <https://ec.europa.eu/consumers/odr/main/index.cfm?event=main.home2.show&lng=EN>.

ly and lengthy judicial remedies. The outcome of citizens' satisfaction indeed strengthens the sense of belonging to the Union and not just being a citizen of one Member State. Such a perception can be encouraged even further by establishing an alternative channel to resolve conflicts throughout the Union. In this way, every citizen feels more protected and involved in affairs at the European cross-border level.

### **3. The European Common Ground of Available Rights (ECGARs)**

As discussed earlier, the application of the algorithmic model of civil dispute resolution in the United States, Canada and Australia has attracted more attention compared to in Europe. Moreover, there is a significant distinction between the current attitude in the EU and in the other mentioned jurisdictions towards privatization – in contrast to the adversarial approach – of justice services in civil dispute resolutions, which is mainly embedded in the context of the 'rule of law'<sup>75</sup> as a principle. In this regard, whereas the EU position towards the rule of law still tends strongly to advocate the adversarial approach,<sup>76</sup> the United States,<sup>77</sup> Canada<sup>78</sup> and Australia<sup>79</sup> have already initiated strong support for the privatization of civil justice.

At the EU level, retaining an adversarial approach has caused abundant complexities in resolving cross-border civil disputes.<sup>80</sup> It has been understood that the existing wide disparities among the national laws of the EU Member States – specifically in civil procedural rules – are the major cause for the inefficiency of justice for European citizens. Such ineffectual justice has caused citizens' mistrust in supranational civil proceedings conducted by courts as part of public service. Over-

<sup>75</sup> SHARP, G. (2016). *The Right of Access to Justice Under the Rule of Law: Guaranteeing an Effective Remedy*. Canadian Institute of The Administration Of Justice. Retrieved 19 November 2019. from <https://ciaj-icaj.ca/wp-content/uploads/page/2016/05/the-rule-of-law-and-the-right-to-effective-access.pdf>

<sup>76</sup> HAZEL GENN, D. (2012). *Why the Privatisation Of Civil Justice Isa Rule Of Law Issue*. Lecture, University College London, UK.

<sup>77</sup> JEAN R. STERNLIGHT, *Is Alternative Dispute Resolution Consistent with the Rule of Law?: Lessons from Abroad*, 56DePaul L. Rev.569 (2007). Available at: <https://via.library.depaul.edu/law-review/vol56/iss2/1>

<sup>78</sup> Farrow, T. (2014). *Civil justice, privatization, and democracy*. University of Toronto Press.

<sup>79</sup> GRUIN, J. (2008). *The Rule of Law, Adjudication and Hard Cases: The effect of alternative dispute resolution on the doctrine of precedent*. *Australats Dispute Resolution Journal*, 19(206).

<sup>80</sup> See Chapter III. 1. at p. 10.

coming the existing hurdles in this regard in order to advance the effectiveness of justice in civil matters, thereby demands reconceptualizing the approach towards resolving civil disputes. Thus, it is necessary to shift from the exclusively adversarial systems in the EU – rendered by public justice services i.e. national courts – to the wider application of private justice by providing citizens with more elaborated access to private models of civil dispute resolution.<sup>81</sup>

Nevertheless, privatization of justice by using Alternative Dispute Resolutions (ADRs), Online Dispute Resolutions (ODRs) or Automated Decision-making Systems (ADSs) to resolve civil disputes has sparked some critics to attack the informalization of dispute resolution, arguing that it is against the principle of the rule of law. In this vein, a major criticism was raised by Owen M. Fiss arguing that a preference for non-judiciary models of dispute resolution over adjudication would lead to the sacrifice of justice for the sake of peace. In his arguments, Fiss has precisely clarified the advantages of using litigation over ADRs particularly in negotiation. He also seriously doubts the effectiveness of private dispute resolution models in safeguarding and promoting individual rights – due to causing a lack of elaboration of law – compared to public litigation systems.<sup>82</sup> Similarly, Jean R. Sternlight in her analytical article on mandatory arbitration argued that the privatization of dispute resolution does not necessarily safeguard citizens' interests in providing them with a significant and essential educational function compared to the judiciary systems – in terms of holding public hearings and publishing judgments issued by judges residing at civil courts.<sup>83</sup> Moreover, other critics have highlighted the informalization of dispute resolution causing prejudice in the course of decision-making. Richard Delgado is among those scholars that have clearly expressed concerns over the prevailing influence of emotional and behavioural elements in decision-making within a privatized dispute resolution context. His main emphasis is upon the competency of formal litigation procedures in having control over the two significant components of justice through ensuring fairness and equality between the disputants.<sup>84</sup>

<sup>81</sup> STERNLIGHT (2007), p. 580.

<sup>82</sup> FISS, OWEN M. (2009). *The History of an Idea, Symposium: Against Settlement: Twenty-Five Years Later*. 78 *Fordham L. Rev.* Available at: [http://fordhamlawreview.org/wpcontent/uploads/assets/pdfs/Vol\\_78/Fiss\\_December\\_2009.pdf](http://fordhamlawreview.org/wpcontent/uploads/assets/pdfs/Vol_78/Fiss_December_2009.pdf), Retrieved 17 November 2019.

<sup>83</sup> STERNLIGHT, JEAN R., "Creeping Mandatory Arbitration: Is It Just?" (2005). *Scholarly Works*, paper no. 280, p. 1631.

<sup>84</sup> DELGADO, RICHARD (1997). *Alternative Dispute Resolution--Conflict as Pathology: An Essay for Trina Grillo*. *Minnesota Law Review*.

As previously noted, most of these critics have expressed their concerns over jeopardizing the rule of law by the informalization of dispute resolution in civil matters. However, as the authors of this study believe that the model of private conflict resolution introduced here (the CREA) is not in contradiction with the rule of law, the authors present the following arguments to support their view.

First, to assess the compatibility of private justice with the rule of law, it is necessary to understand how privatization can reasonably fit within the fundamental components of the rule of law. Referring to the various principles of the rule of law<sup>85</sup> clarifies that among all these ideas, ‘*the observance of natural justice*’ is most compatible with the concept of private justice. It should be demonstrated that ‘natural justice’ will be born as an outcome of resolving a conflict in an open, fair and non-biased process.<sup>86</sup> Considering the nature of the private models of dispute resolution, in private justice settings, parties to the claim have the opportunity to be heard fully on the dispute by an impartial entity who is independent of the disputants and not influenced by bias. Therefore, it can be demonstrated that the informalization of dispute resolution in civil matters is consistent with the rule of law and the Member States should facilitate private arrangements between individuals to enable them to pursue their choices of civil dispute resolution methods, based on the parties’ mutual agreement.<sup>87</sup> It is necessary here to clarify that the term facilitation of private arrangements for disputants is rooted in the concept of freedom of contract. This connection clearly highlights that the Member State should seriously consider the wills of the parties to decide their own methods of dispute resolution in civil matters based on free choice and without state intervention.<sup>88</sup>

<sup>85</sup> Joseph Raz has mentioned the most significant constituting principles of the rule of law as, “All laws should be prospective, open and clear”; “Laws should be relatively stable”; “The independence of the judiciary must be guaranteed”; “The principles of natural justice must be observed”; “The courts should have review powers over the implementation of the other principles”, etc. See Raz, J. (1979). *The authority of law: Essays on law and morality*. Oxford: Clarendon, pp. 214-218.

<sup>86</sup> For more information on ‘natural justice’ see Snider, Judith A., & Yates, C. Kemm. (1995). *Alternative dispute resolution: Use and abuse of information and specialized knowledge*. (Canada). *Alberta Law Review*, 33(2), 301-341.

<sup>87</sup> RAZ, J. (1979). *The authority of law: Essays on law and morality*. Oxford: Clarendon, p. 170.

<sup>88</sup> It should be noted that the general right to contract can be restricted on the grounds of public concerns. See Weber, David P. (2013). *Restricting the freedom of*

Another significant point to consider regarding these critiques on the inconsistency between private justice and the rule of law is that the critics make no serious attempt to distinguish between the domestic and international application of private dispute resolution.<sup>89</sup> At the domestic level, the Member States' hesitation towards informalization of private justice may seem justifiable by referring to the power of the state in preventing the abuse of power bestowed on private actors to deliver justice.<sup>90</sup> On the other hand, dealing with cross-border civil disputes against the backdrop of the existing plurality of EU Member States' legal systems – with the diverse range of civil and civil procedural laws failing to deliver efficient justice for citizens – demands a reconsideration of adhering solely to the adversarial approach.

Finally, regarding the link between the privatization of civil dispute resolution and the rule of law, Sternlight draws our attention to rethinking the relationship between these two concepts. She then points out that instead of having a sole reliance on private justice or adversarial proceedings, it is far more rational to adopt a binary approach from which, as a result, citizens can benefit from the significant roles of both social norms and the law, functioning closely together to deliver efficient civil justice.<sup>91</sup>

In view of all that has been mentioned so far, the primary focus of the CREA project Consortium has been to establish a private model of dispute resolution that functions on the basis of the laws through establishing the European Common Ground of Available Rights (ECGARs). Such constitution – with its binary approach – advances the efficiency of justice in resolving cross-border civil conflicts through laying emphasis on extracting similarities among the laws of the Member States and incorporating them into the CREA software.

It is worth noting that CREA is the first comprehensive effort, in its own category, in collecting all the mandatory rules of each Member State to create a common ground out of them and establish the ECGARs framework for the entire European Union.

This common ground is essentially based on the data acquired from seven selected EU jurisdictions including Belgium, Croatia, France, Greece, Italy, Lithuania and Slovenia. The derived data was

contract: A fundamental prohibition. (p. 51-76). Yale Human Rights and Development Law Journal, 16, 51.

<sup>89</sup> Supra note 78, p. 580.

<sup>90</sup> Although such critical reflection per se can be also questioned, however the discussion about it falls beyond the scope of this paper.

<sup>91</sup> Supra note 78, pp. 581-589.



specifically collected in two areas of civil law, namely divorce and inheritance, from each of these European Jurisdictions.

As previously discussed, the major reason for opting for these two areas of civil law lies in the fact that the nature of most disputes arising out of divorce settlement or inheritance are rooted in asset division. Thus, conflicts over dividing marital property or the disposition of an estate among heirs are the most compatible disputes to be resolved through algorithms.

The data collected were used to represent the mandatory rules on divorce and inheritance with explicit focus on the division of assets to constitute the ECGARs framework which would not be grounded in legal principles, but instead in the properties of the algorithms. Creating such common ground will facilitate efficient access to justice through a more expedited and less expensive means of dispute resolutions. For that purpose, the authors as part of the CREA team provide a concise and comprehensive overview of such mandatory rules within the selected national jurisdictions pursuing a comparative approach in analysing the collected data.

Having discussed the ECGARs, the following section of this paper addresses the methodology applied in collecting and analysing the necessary data on divorce and inheritance from the jurisdictions studied to constitute the common ground.

#### ***4. Methodology***

The methodology adopted by the authors was mainly based on qualitative research. However, the acquired data were visualized in tables and graphical figures to provide a more developed and precise understanding of the research for readers regardless of their legal or non-legal background.

The samples for collecting data consisted of seven EU Member States including Belgium, Croatia, France, Greece, Italy, Lithuania and Slovenia. The only driving factor for choosing these seven States out of a total of 28 EU Member States solely refers to the nationalities of the project partners. Following the selection of samples, a set of questions were designed by the authors to insert the answers into a pre-determined framework and increase the quality of comparative study at later stages of the research.

The questions were sent to each project partner residing in the target countries. They were asked to provide the most compatible answer, according to the national legislations on divorce and inheritance, to the questions in particular where division of property is explicitly

involved. Once the reports on the investigated jurisdictions were received by the authors, it was first necessary to extract the fractions and numerical data on the division of assets to establish the framework of the ECGARs. Following the legal analysis of the collected rules, conducted by the authors, the extracted fractions and numeric data were sent to the Information Technology Unit of the CREA project to be used as an input into the system for the purpose of designing the algorithmic dispute resolution model in CREA software.

## ***5. Results and Findings***

### **a) Divorce – Matrimonial property regimes**

The first set of questions aimed at identifying the ‘recognized matrimonial property regimes’ under the studied national legislations. The purpose of this investigation was to find out the existing similarities and differences among the rules on asset division.

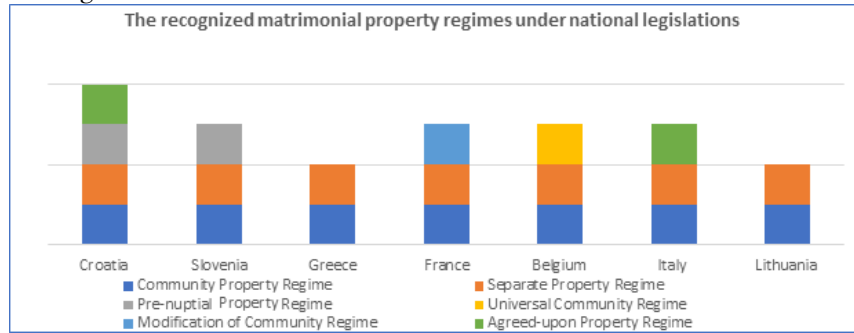
To distinguish various types of matrimonial property regimes recognized by the selected jurisdictions, Figure 1 presents a comparative overview of these regimes.

The most striking observation to emerge from the data comparison is the acceptance of the Community Property Regime and Separate Matrimonial Property Regime by all these Member States.

It is necessary here to clarify exactly what is meant by these two property regimes. The term Community Property (or Co-ownership) has been generally used to refer to situations in which the spouses jointly co-own the assets in the context of their marriage. In contrast, the concept of Separate Matrimonial Property Regime by default assumes the assets fall under the independent ownership of each spouse.

Interestingly, there are also other types of matrimonial property regimes recognized by some of the Member States. This can be seen in the case of Croatia in which the other two property regimes have been identified by the Croatian legislator under the Pre-nuptial and Agreed-upon Property Regimes. Thus, couples in this country have more options available to them to choose their favoured governing system from any of these four property regimes. In similar cases, national legislators in Slovenia (Pre-nuptial), Belgium (Universal Community), Italy (Agreed-upon) and France (Modification of Community) also recognize an additional type of matrimonial property regime compared to Greece and Lithuania that have merely recognized the Community and Separate Matrimonial Property regimes to govern the division of assets between the spouses.

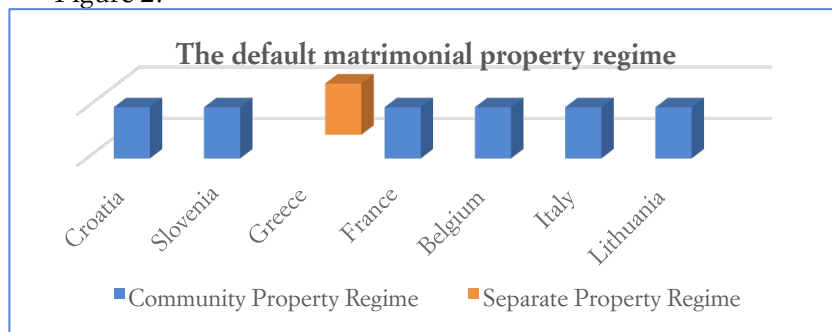
Figure 1.



Another significant finding of the current investigation into the matrimonial property regimes of the selected Member States was to identify the default regime applicable to property division between spouses. In this literature, the term ‘default regime’ tends to be used to refer to situations where the spouses have not opted to choose their favoured matrimonial property regime. Consequently, upon separation/divorce the default matrimonial property regime is automatically applicable to asset division and financial matters between the couple. However, the spouses have the option to choose their preferred matrimonial property regime to govern ownership of the assets.

As shown in Figure 2, except for Greece, all the countries follow a similar approach in accepting the co-ownership property regime as a default regime to govern splitting assets between the spouses. To further clarify, Greece has accepted the separation of property as the default matrimonial property regime.

Figure 2.



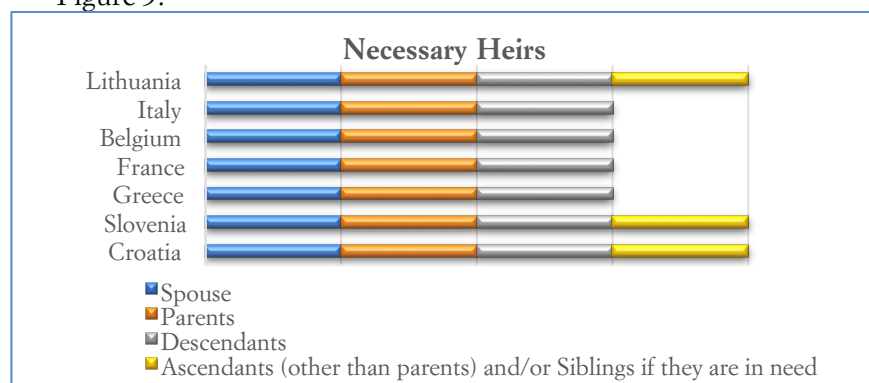
**b) Inheritance – Necessary heirship and the imposed portions<sup>92</sup>**

<sup>92</sup>The meaning of the ‘necessary heirship’ and their portions is established by the

In the process of conducting the CREA research study, with the purpose of establishing the ECGARs, the remaining questions were specifically focused on investigating the inheritance laws of the selected jurisdictions.

The primary inclusion criteria for extracting the relevant data among the vast array of inheritance laws related to identifying the necessary heirs and their portions to provide fractions of their shares in the estate. The Figure below illustrates the necessary heirs recognized under each jurisdiction.

Figure 3.



From the data in the above figure, it is crystal clear that all these legal systems primarily accept the principle of 'necessary heirship'. Nevertheless, the most significant outcome is that these jurisdictions have unanimously taken a similar approach in identifying spouse, parents and descendants (including children and their offspring) as necessary heirs to the deceased.

However, except for descendants that are generally considered as protected heirs, spouse and parents have some special status in some jurisdictions. Concerning parents, their status as necessary heirs is not absolute, since this right is conditioned to circumstances where they are in need. For instance, in France, parents are regarded as necessary heirs provided that there are no children causing the inheritance to be shared between the surviving spouse and parents of the deceased. Likewise, in the absence of a surviving spouse, the parents are considered as necessary heirs along with the children to the demised. Slovenian laws on inheritance recognize the parents to the deceased strictly

legislators to provide a protective legal shield against the unjust deprivation of the necessary heirs who are generally among the close family members to the demised.

as necessary heirs. In Belgium, parents are primarily considered as necessary heirs, however this entitlement is solely limited to receiving a life maintenance. Also, in Italy and Greece, parents are necessary heirs provided that there are no children as heirs.

In comparison, in Lithuania, parents are necessary heirs contingent upon being in need. Under Croatian laws, parents must comply with two preconditions to be regarded as necessary heirs that is being recognized as incapable of working and being unable to support themselves.

Furthermore, it is apparent from Figure 3 that the ancestors and/or siblings of the deceased are only conditionally recognized as necessary heirs in Croatia, Slovenia and Lithuania. These circumstances are mostly need-based for this category of heirs.

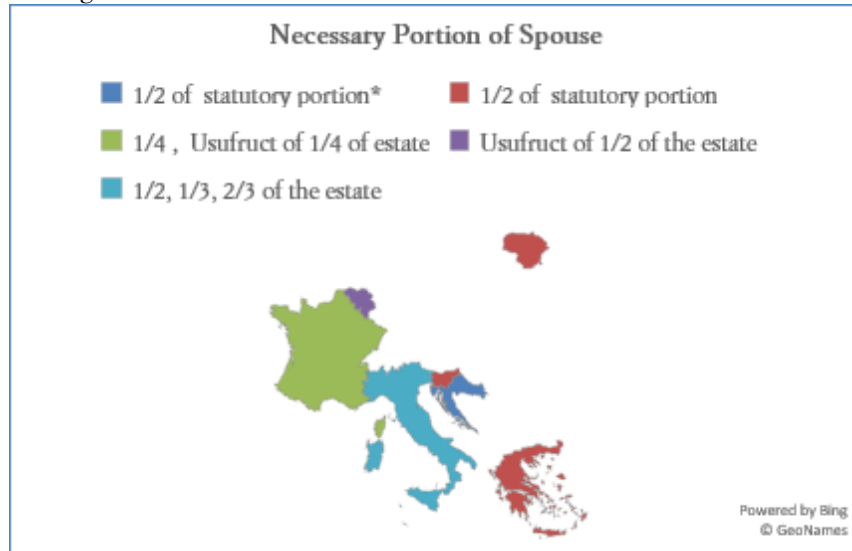
The Figures below indicate the portion of necessary heirs limiting the freedom of the testator to dispose of his/her assets against the protected heirs. As is apparent, the presented portions are different in the various Member States, either based on the statutory portion of necessary heirs or in relation to the entire estate.

One significant finding at this stage of the analysis was identifying the two different approaches taken by these jurisdictions concerning the shares of protected heirs. While some of these legal systems define the compulsory portion on the basis of statutory share, the others apply the principle of the whole estate to calculate the necessary portion.

Thus, the necessary share of the surviving spouse in the Member States studied is presented in Figure 4. Accordingly, the obligatory portion for a spouse in Slovenia, Croatia, Greece and Lithuania<sup>93</sup> is half of the statutory portion the surviving spouse would have been entitled to. Whereas, in France and Italy this portion depends on the number of children. As an example, in Italy in the case that the spouse is the only heir, s/he receives half of the estate. In the case that there is one child, the spouse's necessary portion is one-third and if there are two or more children, the surviving spouse's compulsory share is one-quarter of the entire estate.

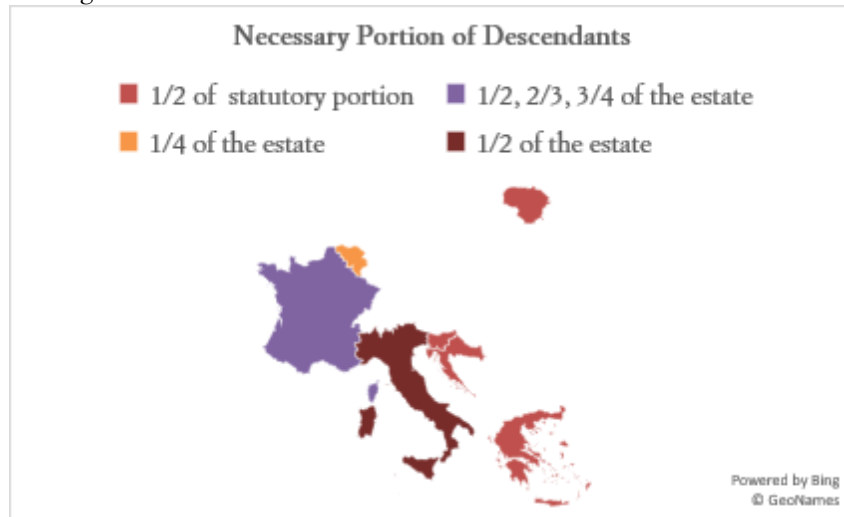
<sup>93</sup> If there are no more than three heirs of the first line, the spouse inherits  $\frac{1}{4}$  of the inheritance. If there are more than three heirs of the first line, the spouse inherits an equal share with the heirs of the first line. If there are no heirs of the first line and the spouse inherits together with the heirs of the second line, the spouse inherits half of the inheritance. If there are no heir of the first and the second lines, the spouse inherits all inheritance.

Figure 4.



\* In Croatia, the extra-marital partner. Registered and non-registered same-sex partners inherit the same portion as the spouse.

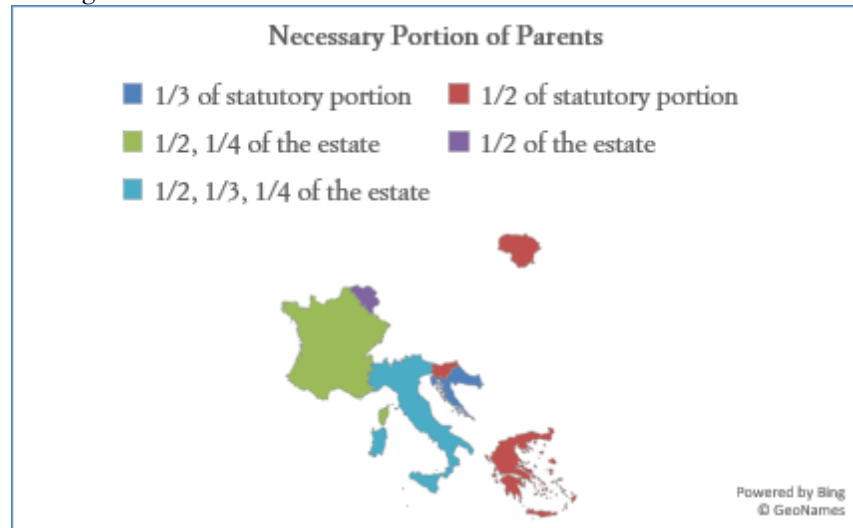
Figure 5



The Figure above shows the necessary share of descendants (including children and their offspring). For example, in France the number of descendants is taken into account to determine their obligatory shares. Hence, half of the estate is the necessary share of one

child, two-thirds of the whole estate for two children and three-quarters is the protected portion for three and more children.

Figure 6.



Likewise, as illustrated in Figure 6, the necessary portion of parents in the estate of the deceased is distinctly different in these countries. For instance, under the Italian and Greek Civil Code, parents' necessary portion is based on various circumstances. In fact, in the case that parents are the only heir, their obligatory portion is one-third of the estate, while if there is a surviving spouse, the necessary share of parents is then restricted to one-quarter of the entire inheritance. In addition, under Lithuanian law, if it is proved that parents are in need, they are entitled to half of their statutory portion. Similarly, in Croatia, parents are entitled to receive one-third of their statutory share if there is evidence that they are in need and incapable of working.

## 6. Research Limitations

During the course of conducting this study, there were a number of limitations. Firstly, it is unfortunate that the study did not include all the existing jurisdictions within the EU. Thus, being limited to investigating merely seven European Jurisdictions, compared to the total of 28 Member States, the size of this study was rather small. Secondly, despite the completion of CREA software by the Mathematics and Information Technology Units of the project, this tool is still undergoing

its testing phase. Therefore, the authors were unable to conduct an in-depth investigation into the results of the CREA software due to the lack of sufficient users' feedback. This limitation was caused more by the lack of adequate knowledge on the applicability of algorithms in terms of civil dispute resolution (particularly, where asset division is involved) among academia, legal practitioners and other categories of citizens.

Furthermore, despite the success of this research in establishing the European Common Ground of Available Rights, nonetheless there are still a considerable number of disparities among the existing legal systems of the EU Member States on civil and civil procedural rules. Such deep disharmonies not only restricted, but also complicated the investigation into the national laws pertinent to divorce and inheritance with the aim to extend the ECGARs at the EU cross-border level.

### ***Conclusions and Future Research***

The purpose of the present research was to examine the applicability of Conflict Resolution with Equitative Algorithms (CREA) in resolving civil disputes with a specific focus on the distribution of assets in divorce and inheritance matters – on the basis of the fair solution theory.

The second and major aim of this study was to reveal and discuss the establishment of the European Common Ground of Available Rights (ECGARs) as a result of implementing the CREA project. In this regard, the divorce and inheritance rules – affecting asset division – of several EU Member States were investigated using a qualitative research methodology.

The findings of this research have shown that the CREA software is applicable as an alternative tool to assist disputants in resolving their conflicts concerning the division of assets in divorce and inheritance in a non-adversarial context, at both national and cross-border level. The interpretation of the collected data confirmed that application of the CREA online tool by either public or private actors can greatly benefit disputants providing effective access to justice to resolve their conflicts.

Moreover, another significant practical achievement of this study can be seen in the establishment of the ECGARs for the first time in the EU, which contributes towards tackling the existing disparities among the laws of Member States on cross-border asset division in divorce and inheritance disputes.



Although the current study is based on a small sample of investigated EU legal systems (only seven out of a total of 28 Member States), the findings suggest that the CREA pilot project functioned well in the capacity of resolving asset division conflicts in its testing phase. However, this research has thrown up some questions in need of future investigation. Therefore, further research is required to closely examine the results and users' feedback on the applicability and efficiency of the CREA algorithmic model of dispute resolution in the European context. Hence, another study should be carried out to explore all the EU Member States' legal systems and their relevant laws on divorce and inheritance regarding the distribution of property. Further investigation will furnish the already established ECGARs framework with new rules transforming it into a more coherent and developed source to be added to the CREA software for future application at much broader scale.

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