The role of Artificial Intelligence in Online Dispute Resolution: A brief and critical overview

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ABSTRACT

The growth of online dispute resolution can be seen both in real terms, via the development of systems to deal with lowcomplexity disputes, and theoretically, with many commentators arguing that such systems represent the future of dispute resolution and the law as a whole. At the same time, substantial developments have been made in the use of artificial intelligence to aid online dispute resolution. Artificial intelligence agents can be identified as existing in a number of different areas of dispute resolution as both an aid and a replacement for traditional resolution techniques. It can be asserted that unless carefully developed, a number of issues will emerge around the way that users interact with these systems. AI-based ODR systems can fail to take into account information which usually affects dispute resolution, like emotional responses or abstract qualities of negotiating parties. Additionally, such systems are not yet equipped to handle certain overarching principles of justice which affect the resolution process and can therefore have a subversively normative effect. Furthermore, it is easy to conceive of a future in which access to justice is hampered rather than helped by the development of AI processes. Therefore, this paper aims to investigate the role that AI currently plays in shaping ODR, and how that role might develop in the future. First this paper briefly analysed the nature of the development of AI in ODR and the technology is utilised. This will lend itself to a discussion regarding what direction the industry is going in. Second, the issues surrounding the interface between humans and machines was investigated and the potential effects of these issues upon ODR was evaluated. Finally, the effect of AIs in ODR, with regards to an individual's access to justice, was analysed. It concludes that a significant level of oversight and regulation will be necessary to obviate issues with AI in ODR. Also, this paper provides a series of recommendations regarding how best to proceed with AI in ODR.

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1. Introduction

Law is, at its heart, a matter of dispute resolution.[1] It is therefore of little surprise that a significant amount of discussion revolves not only around the nature of the law itself,[2] but also around the manner in which disputes are resolved.[3] Nonetheless, there is consensus on the fact that one major weakness of resolving disputes using the judicial system is that it is time-consuming. This leads to extensive costs associated with litigation. Consequently, many parties are opting for Alternative Dispute Resolution (ADR)[4] mechanisms. These are not only cheaper but they also provide parties with the means of finding creative solutions which benefit both sides. Within the realm of ADR, Online Dispute Resolution (ODR)[5] is emerging as a leading dispute resolution tool. ODR represents the combination of modern technology with current ADR techniques.[6] As a result, ODR has become prominent over the course of the last few decades.[7] Arguably, the lines between ODR and traditional legal systems are likely to blur in the future. For example, Lord Justice Briggs recently called for the creation of an online civil court system due to the increased sophistication of online services and large proportion of court users who are able to communicate online.[8] Given the changing landscape of disputes resolution due to globalisation, I believe ODR ought to be examined in detail.

Concurrently to the rise of ODR, the use of artificial intelligence (AI) systems in dispute resolution has grown significantly. AI can be utilised in a plethora of ways.[9] This growth is itself contextualised by wider conversations about the growing role of AI at a societal level.[10] For example, AI can act as a mediator or provide a quantitative break down in assets. Therefore, it is important to investigate the role that AI currently plays in shaping ODR, and how that role might develop in the future to enhance the efficiency of ODR. This paper examines the development of AI in ODR and the technology that is utilised. This lends itself to the discussion regarding what direction the industry should

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[1]Ronald Dworkin, *Law's Empire* (HUP, 1986) 13.

[2]Debates on the nature and purpose of the law in Anglo-American legal philosophy have largely centred around the Hart-Dworkin debate – whether the law is a model of rules and what are the limits of judicial discretion. An incredible amount of literature focuses on justifying Dworkin's objections or defending Hart's reply. For a brief overview, see Scott J Shapiro, 'On Hart's Way Out' in J Coleman (ed), *Hart's Postscript: Essays on the Postscript to the Concept of Law* (Oxford University Press 2001); Kenneth Einar Himma, 'HLA Hart and the Practical Difference Thesis' (2000) 6 Legal Theory 1; WJ Waluchow, 'Authority and the Practical Difference Thesis' (2000) 6 Legal Theory 45; Matthew Kramer, 'How Moral Principles Can Enter the Law' (2000) 6 Legal Theory 83.

[3]The debate has been centred around the merits of the adversarial and communitarian bargaining theories. See Robert J Condlin, 'Cases on Both Sides: Patterns of Argument in Legal Dispute Negotiation' (1985) 44 Maryland Law Review 65; Robert J Condlin, 'Bargaining in the Dark: The Normative Incoherence of Lawyer Dispute Bargaining Role' (1992) 51 Maryland Law Review 1; Rebecca Hollander-Blumoff, 'Just Negotiation' (2010) 88 Washington University Law Review 381; Carrie Menkel-Meadow, 'From Legal Disputes to Conflict Resolution and Human Problem-Solving: Legal Dispute Resolution in a Multidisciplinary Context' (2004) 54 Journal of Legal Education 7.

[4]Nadja Marie Alexander, *Global Trends in Mediation* (Kluwer, 2006) 6.

[5]Electronic ADR (eADR), online ADR (oADR) and Internet dispute resolution (iDR) are synonymous.

[6]Karolina Mania, 'Online dispute resolution: The future of justice' (2015) 1 *International Comparative Jurisprudence* 76, 77 <http://dx.doi.org/10.1016/j.icj.2015.10.006> accessed 26 September 2021.

[7]Ibid, 78.

[8]Lord Justice Briggs, *Civil Courts Structure Review: Interim Report* (Judiciary of England and Wales, 2015) 6.7 <https://www.judiciary.uk/wp-content/uploads/2016/01/ccsr-interim-report-dec-15-final1.pdf> accessed 25 September 2021.

[9]Carneiro et al. 'Online dispute resolution: An artificial intelligence perspective' (2014) 41 Artificial Intelligence Review 211, 212.

[10]Olivia Solon, 'Man 1, machine 1: landmark debate between AI and humans ends in draw' (The Guardian, 19 June 2018) <https://www.theguardian.com/technology/2018/jun/18/artificial-intelligence-ibm-debate-project-debater> accessed 26 September 2021.

take. This paper also critically examines the issues surrounding the interface between humans and machines and assesses the potential effects of these issues upon ODR. It then attempts to determine the extent to which AI in ODR enhances individuals' access to justice. Finally, a series of recommendations are made regarding how best to proceed with AI in ODR. It is concluded that a significant level of oversight and regulation will be necessary to obviate issues with AI in ODR.

1.1. Definitions

Due to the novel nature of AI and ODR, the definition of key terms is not straightforward.[11] Therefore, it is vital to shed light on definitions of both of ODR and AI for the purposes of circumscribing the analysis in this paper.

1.1.1. Online dispute resolution

In the era of innovation, e-commerce and rapid development, dispute resolution has found a new and innovative way by using technology to solve disputes.[12] In the digital age, one cannot deny the fact that "conflict is a growth industry."[13] Therefore, demand for dispute resolution tools will likely grow simultaneously.[14] Consequently, it is crucial to lay out a clear definition of ODR in order to delineate its role. ODR may be defined as the use of information and communication technology to help people prevent and resolve disputes.[15] ODR roundly describes an easier, faster and more efficient mode of pursuing ADR.[16] A thorough examination of diverse definitions of ADR is beyond the purview of this paper. However, it is generally regarded as those avenues for resolving disputes that do not require the use of litigation or traditional legal systems.[17] Such alternative avenues might be negotiation, mediation and arbitration.[18] Nonetheless, it should also be noted that there is nothing that precludes ODR from being a component of traditional legal proceedings, especially in the future when the relevant technology and techniques are more fully developed.

However, a simple definition of ODR as 'ADR' plus 'online' tools would be too broad, given the high prevalence of networked communication. It is difficult to imagine any modern conflict not involving the sending of at least one email or message between the parties involved. Thus, it is more useful to use a nuanced definition that encompasses dispute resolution processes and the creation of a 'virtual environment' to solve disputes.[19] Although the strict boundaries of this definition are blurry, they exclude extremely simple uses of online processes from ODR. For example, the mere scanning and sending of an invoice as evidence involves an online process, but it cannot be regarded

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[11]Mania (n 6) at 77.
[12]Ethan Katsh and Orna Rabinovich-Einy, *Digital Justice Technology and the Internet of Disputes* (OUP, 2017) 1.
[13]Roger Fisher and William Ury, *Getting to YES Negotiating an Agreement without Giving In* <https://www.fd.unl.pt/docentes_docs/ma/AGON_MA_25849.pdf> accessed 25 September 2021.
[14]Katsch (n 12).
[15]Dave Orr, Colin Rule, 'Artificial Intelligence and the Future of Online Dispute Resolution' (2017) Santa Clara High Technology Law Journal 10.
[16]Mania (n 6) at 77.
[17]Carneiro (n 9) at 213.
[18]Ibid; John Olin and Robert Mnookin, 'Alternative Dispute Resolution' [1998] Harvard Law School Center for Law, Economics and Business Discussion Paper Series 232 <http://lsr.nellco.org/harvard_olin/232> accessed 25 September 2021.
[19]Ethan Katsh, Janet Rifkin, *Resolving Conflicts in Cyberspace* (Jossey-Bass, 2001) 17.

as creating a virtual environment for the settlement of disputes.[20] Rather, such a virtual environment may include[21] communication exclusively via a chatroom, with documents uploaded for all parties to see.[22] Alternatively, desires might be translated into numerical values by a computer.[23] This can be greatly distanced from more traditional methods of ADR involving face-to-face meetings in which tone, body language and environment might all have a tangible effect upon proceedings.[24]

ODR has grown in popularity over recent years since 1990.[25] By 1999, ODR was readily embraced by many companies. The first use of ODR began in the United States of America.[26] Thereafter, ODR has become widespread. It has been used by eBay, the SquareTrade portal, CyberSettle and many other commercial service providers.[27] However, it was only in 2001 that governments began to see the value in ODR. Many noted that by moving disputes online, the burden on the courts was reduced and the efficiency of resolving disputes was enhanced.[28] For example, the "Money Claim Online" platform is a judicial ODR platform in England and Wales. The platform resolves legal issues for fixed sum claims up to £100,000.[29]

1.1.2. Artificial intelligence

AI is unique. This is because AI can develop itself by using intelligent techniques or by working intelligently.[30] Therefore, it is perhaps not surprising that there have been many definitions of AI over the years. The difference in the definitions of AI varies according to how it is seen from each academic's perspective. Some academics define AI based on how it works, its main features and what it can do. Others define it based on what it cannot do.[31] Another definition of AI compares human ability with AI which is " … trying to solve by computer any problem that a human can solve faster."[32] This definition is viewed as not being clear on the point of whether the human or the computer is faster. However, Lodder and Thiessen argue that while it may have originally meant that the human is faster, in the current context, it should be interpreted as implying the opposite meaning, leading to their formulation that AI is " … trying to solve by computer any problem, that a human can solve, better, faster, more consistently, without getting tired, etc."[33] In the same vein, Nilsson has defined AI as "The activity devoted

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[20]Civil Justice Council, *Online Dispute Resolution* (Civil Justice Council, 2015) <https://www.judiciary.uk/wp-content/uploads/2015/02/Online-Dispute-Resolution-Final-Web-Version1.pdf> accessed 16 September 2021.
[21]Hairong Li, Terry Daugherty, Frank Biocca, 'Characteristics of Virtual Experience in Electronic Commerce' (2001) 15 Journal of Interactive Marketing 13.
[22]Ibid.
[23]Mania (n 6) at 71.
[24]Orr (n 15) at 10.
[25]Ibid.
[26]Faye Wang, *Internet Jurisdiction and Choice of Law: Legal Practises in the EU, US and China* (CUP, 2010).
[27]Ethan Katsh, Janet Rifkin and Alan Gaitenby, 'E-Commerce, E-Disputes, and E-Dispute Resolution: In the Shadow of eBay Law' Vol15(3) Ohio State Journal on Dispute Resolution 705 <http://pages.ebay.> accessed 16 September 2021.
[28]Ibid.
[29]Money Claim, HM Courts and Tribunal Services, <https://www.moneyclaim.gov.uk> accessed 15 September 2021.
[30]Arnold Lodder and Ernest Thiessen, 'The Role of Artificial Intelligence in Online Dispute Resolution' [2003] <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.97.9137&rep=rep1&type=pdf> accessed 10 September 2021.
[31]Arno R Lodder and John Zeleznikow, 'Developing an Online Dispute Resolution Environment: Dialogue Tools and Negotiation Support Systems in a Three-Step Model.' <https://research.vu.nl/ws/portalfiles/portal/2115691> accessed 20 September 2021.
[32]'The Free On-line Dictionary of Computing' <http://foldoc.org≥ accessed 12 January 2018.
[33]Lodder and Thiessen (n 28).

to making machines intelligent, and intelligence is that quality that enables an entity to function appropriately and with foresight in its environment."[34]

The difficulty of finding consensus on the definition of AI is related to the fact that the term 'intelligence' itself is nebulous.[35] For the sake of brevity, a working definition can be lifted from computer science academia: "any device that perceives its environment and takes actions to maximise its chance of successfully achieving its goals."[36] Again, such a definition is too broad. A refrigerator which monitors temperature and adjusts its cooling element can accordingly be regarded as acting intelligently. In the same regard, a hyper-advanced futuristic computer also acts intelligently if it provides life-counselling advice to stressed office workers. Therefore, one can see that precision is the key;[37] trying to define how a device will perform in an intelligent way helps to clarify how the device may enhance human abilities.[38] However, the very nature of AI is that it is constantly evolving.[39] Therefore, a precise definition is only ever likely to be suitable only for a short period of time. This paper regards AI to be a developing and largely theoretically unbridled technology. Whilst the future is uncertain, it is still arguably possible to examine current trends in AI and ODR in order to discuss what might occur in the future.

2. The Role of AI in ODR

2.1. Current role of AI in ODR

Before one can consider the future of AI in ODR, it is important to consider the past and current relationship between AI and ODR. Historically, AI has played a role in the application of justice, preservation of rights, and the promotion of social values. For example, by facilitating legal work and increasing its efficiency by resolving disputes. One way this is achieved is by helping people to understand the human reasoning process in constructing and sustaining legal arguments.[40] Law is created and enforced by a chain of processes which include information processing, reasoning, and decision making. Similarly, AI works by information retrieval, knowledge representation and reasoning, natural language processing, machine learning and data mining.[41]

Although AI and law publications can be traced back to the early 1950s,[42] the focus began in the 1970s.[43] However, since the early 1980s, Law and AI has been an interesting

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[34]Nils Nilsson, *The Quest for Artificial Intelligence: A History of Ideas and Achievements* (CUP, 2009).
[35]Ibid.
[36]David Poole, Randy Goebel, Alan Mackworth, *Computational Intelligence: A Logical Approach* (OUP, 1998) 1.
[37]Sundar Pichai, 'AI at Google: our principles' <https://www.blog.google/technology/ai/ai-principles/> accessed 10 September 2021.
[38]Matthew U Scherer, 'Regulating Artificial Intelligence Systems: Risks, Challenges, Competencies, and Strategies' (2016) 28 Harvard Journal of Law & Technology 171.
[39]Stuart Russell and Peter Norvig, *Artificial Intelligence: A Modern Approach* (3rd edn, Pearson 2014) 1039.
[40]Solicitors Regulation Authority, 'Improving access - tackling unmet legal needs' (*Solicitors Regulation Authority*, June 2017) <https://www.sra.org.uk/risk/resources/legal-needs.page> accessed 26 September 2021.
[41]Mireille Hildebrandt, 'Law As Computation in the Era of Artificial Legal Intelligence. Speaking Law to the Power of Statistics' [2017] SSRN Electronic Journal 458 <https://www.ssrn.com/abstract=2983045> accessed 26 September 2021.
[42]Layman E Allen, 'Symbolic Logic: A Razor-Edged Tool for Drafting and Interpreting Legal Documents' (1957) 66: 833 Yale Law School Yale Law School Legal Scholarship Repository Faculty Scholarship Series Yale Law School Faculty Scholarship 834 <http://digitalcommons.law.yale.edu/fss_papers/4519> accessed 25 September 2021.
[43]Bruce G. Buchanan and Thomas E. Headrick, 'Some Speculation About Artificial Intelligence and Legal Reasoning' (1970) 23 Stanford Law Review 40 <https://www-jstor-org.libproxy.ucl.ac.uk/stable/pdf/1227753.pdf?refreqid=excelsior%3A4a38c2a70c73298a0260daf592954fd4> accessed 25 September 2021.

research field which is about to experience a revolution.[44] As noted above, substantial bodies of literature exist regarding AI and the law as a whole. Therefore, it is pertinent to examine the literature that deals primarily and exclusively with the use of AI in ODR. The relevant literature regarding the current role of AI in ODR can be split into the descriptive: what is happening/what will happen; and the evaluative: the extent to which AI and ODR can be seen as a positive thing.

2.1.1. The Descriptive approach

The descriptive approach to AI in ODR can be further divided into two sub-categories; those which seek to chart the actual AI tools which are utilised in ODR, and those which evaluate the effects that AI in ODR might have. In other words, those that chart specific AI-based ODR mechanisms, and those that chart AI-based ODR as a phenomenon.

In the former categories, commentators like Carneiro *et al*[45] note the substantial growth not of advanced AI-based ODR systems as predicted, but of supportive AI-systems. For example, systems which allow the more effective management of ODR cases or support users by dealing with complex calculations and algorithms on their behalf. Nonetheless, there are some commentators like Orr[46] willing to categorise certain advanced algorithmic systems as being precursors to fully-blown AI-led ODR, such as those used to organise and store the data relating to the multitude of traffic code violations that occur each year. In the latter group are authors like Rifkin[47] and Katch[48] who seek to describe the role of AI in ODR not in technological terms, but as a phenomenon that shapes the nature of the discourse – as a so-called 'fourth party' negotiator. This way of considering the issue describes AI in ODR not as a mere tool to aid resolution, like a telephone or a calculator might be considered, but rather can be regarded as a means of resolution itself.

A particularly common theme across all commentaries is the implementation gap between those technologies which are proposed and predicted within the field, and those which have been realised. Carneiro *et al* [49] note that AI in ODR has been victim of that same obstacle that has beset other applications of AI: slower than expected development. Syme[50] also argued that it is foolhardy to associate the development of a technology with the uptake of that technology. Thus, the slow development of new ODR techniques as a whole might be attributable to several factors that political, economic, psychological and cultural in nature, rather than merely technological advancement. This pattern in the literature cannot be regarded as surprising given the emphasis on AI. A critical analysis here posits an explosion in optimistic predictions, followed by a recalibration of expectations once the realities of the technology become apparent as a pattern which is true for practically all fields of AI research.[51]

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[44]Kevin Ashley, *Artificial Intelligence and Legal Analytics: New Tools for Law Practice in the Digital Age* (CUP 2017).
[45]Carneiro (n 9) at 238.
[46]Orr and Rule (n 13) at 10.
[47]Rifkin J, 'Online dispute resolution: Theory and practice of the fourth party' (2010) 19 Conflict Resolution Quarterly 117
[48]Katsh and Rifkin (n 19) at 84.
[49]Carneiro (n 9) at 238.
[50]David Syme, 'New Worlds of Dispute Resolution' in Tania Sourdin (Ed.) *Alternative Dispute Resolution and the Courts* (Federation Press, 2004) 134.
[51]David Welham, 'AI in training (1980–2000): Foundation for the future or misplaced optimism?' (2008) 39 British Journal of Educational Technology 287.

2.1.2. The evaluative approach

The evaluative approach to AI in ODR ranges between optimistic and pessimistic outlooks. Thompson, for example, asserts[52] that the ultimate benefit of AI in ODR will be the creation of highly supportive systems which will uncork bottlenecks in the judicial system and replace red tape with an efficient process. This implies that such systems will provide the average individual with expertise, guiding the individual to a satisfactory outcome based on the circumstances of their case or dispute.[53] In other words, AI in ODR will augment access to the law. It has also been noted that this is not too far away from the current realities of using automated processes in dispute resolution.[54] Other commentators argue that access to the law might also be increased via the use of AI to decide low value civil cases via ODR.[55] Additionally, it has been argued that AI might be used to create solutions to highly complex disputes in order to overcome the traditional problems associated with such negotiations: emotive discussion and impassioned viewpoints.[56] Most, if not all, optimistic commentators approach the technology in a way which assumes that one day it will be highly developed, beyond usual human capacities.

The proposed technologies are not without their detractors however, and the current literature illustrates this. In contrast to statements positing a beneficial effect on access to justice, it has also been argued that as with other technologies, AI-assisted ODR will first and foremost be accessible by wealthier clients and firms, and will therefore fail to increase the access to justice for those who cannot afford them.[57] Furthermore, there exists a band of commentators (such as Zeleznikow[58] and Abrahams et al.[59]) who are concerned with the negative effects that automated ODR processes might render, including a lack of proper oversight or an overreliance on automated ruling procedures leading to detrimental adherence to any decisions rendered. Such assertions are arguably made by the aforementioned AI-as-fourth-party advocates, who hold that the creation of another party to the dispute resolution process beyond the original two is likely to be detrimental to the outcome,[60] especially if that party exhibits non-human characteristics.[61] There is, therefore, a lack of consensus in the relevant literature regarding the precise effects that AI-based ODR might have. Nonetheless, the literature highlights certain key issues that might arise as a result of AI implementation and provides a fertile ground for further analysis.

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[52]Darin Thompson, 'Creating New Pathways to Justice Using Simple Artificial Intelligence and Online Dispute Resolution' (2015) 1 International Journal of Online Dispute Resolution 1, 53.
[53]Ibid.
[54]Amber Jenner, 'The future of dispute resolution: AI' (Kennedys Law, 2017) <https://www.kennedyslaw.com/thought-leadership/article/the-future-of-dispute-resolution-ai> Accessed 21 September 2021.
[55]Ibid.
[56]Arno Lodder, John Zeleznikow, *Enhanced Dispute Resolution Through the Use of Information Technology* (CUP, 2012) 92.
[57]Jenner (n 54).
[58]John Zeleznikow, 'Can Artificial Intelligence and Online Dispute Resolution Enhance Efficiency and Effectiveness in Courts' (2017) 8 International Journal for Court Administration 30, 43.
[59]Brooke Abrahams, Emilia Bellucci, John Zeleznikow, 'Incorporating Fairness into Development of an Integrated Multi-agent Online Dispute Resolution Environment' (2012) 21 Group Decision and Negotiation 3.
[60]Ayelet Sela, 'Can Computers Be Fair? How Automated and Human-Powered Online Dispute Resolution Affect Procedural Justice in Mediation and Arbitration' (2018) 33 Ohio State Journal on Dispute Resolution 91.
[61]Daniel Rainey, 'Third Party Ethics in the Age of the Fourth Party' (2014) 1 International Journal of Online Dispute Resolution 37, 55.

Arguably, there exist two primary ways in which AI technology is currently being employed in the field: either in a support capacity, or a substitutive one. The difference between the two applications is perhaps best understood via reference to traditional models of dispute resolution. The traditional model calls for two parties or more negotiating concurrently with a third-party mediator, arbitrator or similar.[62] When AI is used in a support role, the third party uses it as a tool to accomplish their goal. In other words, their work is simply enabled or supplemented by the use of AI. When used in a substitutive capacity, the AI begins to take on the essential functions traditionally associated with the third party altogether, for example by coming to decisions or making inquiries of the first and second parties.[63] This is not to say that it is necessary for a system to entirely replace a third-party negotiator. When AI is used in a substitutive capacity, there is no requirement for an android mediator, but merely that the system deals with a portion of the third-party negotiator's work, as further described below. It should be noted that there is a significant crossover between the two categories, largely predicated on the level of advancement in the technology. For example a system which calculates the proper level of compensation to be paid in an industrial arbitration might be supportive if it takes the form of spreadsheet used by an arbitrator, but can be considered substitutive if that same system could ascertain that a far better fiscal outcome would be to create trade deals which favour the party that prevails. Nonetheless, the distinction between supportive/substitutive systems can be used to demonstrate the highest potential areas of AI in ODR. The next section discusses how these may shape the role of AI in ODR in the future.

2.2. The future role of AI in ODR

2.2.1 Supportive AI systems

Supportive AI systems are the most prevalent technologies in the contemporary ODR environment.[64] This is arguably an unsurprising phenomenon; it is far easier to develop a tool for a human to use, rather than as a replacement for the human altogether. Supportive AI systems can be further categorised regarding the nature of the support that they provide.

2.2.1.1. Decision support systems. This is arguably one of the most promising current uses of AI in ODR. It is the area which has witnessed the greatest efforts at development since the early 90s.[65] This is perhaps not surprising – the ability of a system to weigh up different factors and compute the optimal outcome or course of action is a clear indication of its efficiency and effectiveness. For example, systems which plotting shipping lanes, self-driving cars and actuarial software all act on this principle. Therefore, the application of these AI processes to dispute resolution is not a particularly novel

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[62]Carole Silver, 'Models of Quality for Third Parties in Alternative Dispute Resolution' (1996) 12 *Ohio State Journal on Dispute Resolution* 37, 39.

[63]Carneiro (n 9) at 215.

[64]Zeleznikow (n 58) at 32.

[65]Emilia Bellucci, Arno Lodder, John Zeleznikow, 'Integrating Artificial Intelligence, Argumentation and Game Theory to Develop an Online Dispute Resolution Environment' (2004) *Proceedings of the 16th IEEE International Conference on Tools with Artificial Intelligence* 749.

development.[66] This explains why supportive AI-based systems are sound points for thorough consideration when it comes to ODR.

Although their exact form and function varies, such systems are best characterised by their ability to provide information on the level of agreement or disagreement between two parties.[67] For instance, relatively simple situations like an amicable divorce settlement might be examined. At first glance, it might appear simple for a financial calculation to be made – a group of objects are given a monetary value and then split down the middle. However, this fails to take into account the true nature of divorce negotiations – the value of a given object is not dictated objectively, but subjectively, often in accordance with certain emotional factors.[68] Such factors are by definition abstract and therefore the 'true' value of a given object is also largely abstract. This means that there is a huge potential for disagreements to drag on as the two parties, even if helped by a traditional mediator, find themselves having to compare a large number of items against each other, each with a different subjective value to each party (e.g. a record collection against a prized mantelpiece ornament.) This is the point at which a decision-making support system might be used. One such example is the *Family Winner* system, which asks each party to list their disputed items, and then give each item a subjective priority value.[69] The system will then employ algorithms to come up with a nominally optimal solution for distribution, which can then be rejected or accepted. In case of rejection, the system allows the parties to rank those items whose allocation is contested, so that the highest priorities of each party might be met.[70]

Similar systems have also been crafted to guide third parties on the likely satisfaction that negotiating parties will have with a given outcome, as seen in the *SmartSettle* system.[71] Similarly, parties provide preferences regarding certain outcomes, e.g. a high rating for receiving a valuable patent right or a low rating for ownership of a poorly maintained building, allowing mediators to establish outcomes that are likely to satisfy each party. Most notably, parties are able to adjust their wishes as negotiations develop[72] – arguably mirroring the nature of traditional negotiation.

Due to the substantial AI-based ODR development which has occurred, there are a significant number of other systems which have emerged utilising AI in ODR. These include the *Adjusted Winner, AssetDivider, ALIS* and *GetAid* systems.[73] Although they rely on automated processes, they still require substantial human input, with third party human experts guiding the use of the output of each system, as well as often providing a bridge between the system and the negotiating parties due to the complexity of the values required for them to work.[74] Nonetheless, the application of such systems is wide. In order to test the geopolitical viability of certain systems, e.g. *Adjusted Winner*, they have been applied to historical disputes to ascertain whether their outputs are

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[66]Efraim Turban, *Decision Support and Expert Systems: Management Support Systems* (Prentice Hall, 1993) 443.

[67]Lodder and Zeleznikow (n 56) at 92.

[68]Nial Muecke, Andrew Stranieri, Charlynn Miller, 'Re-Consider: The Integration of Online Dispute Resolution and Decision Support Systems' (2008) 430 *CEUR Workshop Proceedings* 62, 63.

[69]Lodder and Zeleznikow (n 56) at 78.

[70]Ibid.

[71]Carneiro (n 9) at 228.

[72]Ibid.

[73]Ibid, 227-229.

[74]Michael Araszkiewicz et al., 'The Role of New Information Technologies in Alternative Dispute Resolution of Divorce Disputes' (2014) 1 European Dispute Resolution Journal 549, 552.

similar to the eventual resolutions of the disputes.[75] For example, when *Adjusted Winner* was applied to the Israel-Palestine dispute around the time of the Camp David Accords in the late 70s, it rendered an output which was substantially similar to that offered by the real Accords.[76] Such a pattern was also reported with regard to the Suez Canal Treaty.[77] This adds value to how AI and ODR can be sewed together to better serve the parties' needs in the future as it would have in the past.

2.2.1.2. Knowledge support systems. Although decision support systems provide procedural support, AI can also be used to provide non-traditional means of accessing information relevant to a given dispute. Perhaps an oversimplification, such systems can be thought of merely as very advanced search engines. However, the complex nature of advanced 'knowledge representation' should not be underestimated.[78] Instead, a truly 'intelligent' search engine would need to be able to take in the relevant details of a presented scenario, requiring a sense of understanding and meaning, and ascertaining the relevant information to present (or omit) in an understandable manner.[79] For example, a knowledge support system might search through rules by examining and applying those statutory provisions which are relevant to the scenario at hand, and case studies by taking into account those cases which are similar in nature and therefore give rise to applicable precedent at the same time. Once both of these tasks are undertaken, it will be possible to deliver the relevant information for a given scenario.[80] It is perhaps telling that this is a highly difficult manoeuvre[81] even in the highly indexed world of law, and would arguably be orders of magnitude more difficult given some of the ODR contexts which arise (e.g. industrial disputes which rely on 'rules' created only by course of dealing or which otherwise involve complex knowledge.) Disregarding the difficulty of designing such systems momentarily, they are arguably highly promising in that they remove a substantial barrier to the resolution of disputes – the need to ascertain where exactly the relevant information lies, be it in the form of rules, evidence, or studies of previous similar disputes.

2.2.1.3. Intelligent interface systems. Rather than a directly supportive system like the above, intelligent interface systems are those which aim to bridge the significant communication gap between human users and other AI systems, for example by enabling the use of natural language as inputs and outputs of the system.[82] By no means is the desire to create such systems exclusive to ODR; natural language processing is somewhat of a holy grail in many AI fields. Nonetheless, the ability to avoid the translation problems discussed below will be an extremely significant leap within the field of ODR, although

[75]Lodder and Zeleznikow (n 54) at 89.
[76]Steven Brams and Jeffrey Togman, 'Camp David: Was the Agreement Fair?' in Frank Harvey, Ben Mor (Eds.) *New Directions in the Study of Conflict, Crisis and War* (Macmillan, 1998) 306.
[77]Ibid.
[78]John Sowa, *Knowledge representation: logical, philosophical, and computational foundations* (MITP, 2000) 51.
[79]Cade Metz, 'AI Is Transforming Google Search. The Rest of the Web Is Next' (Wired, 2 April 2016) <https://www.wired.com/2016/02/ai-is-changing-the-technology-behind-google-searches/> Accessed 10 September 2021.
[80]James Popple, 'Legal Expert Systems: the inadequacy of a rule–based approach' (1991) 21 Australian Computer Journal 11.
[81]Ronald Brachman, *Knowledge Representation and Reasoning* (Morgan Kaufmann, 2004) 336.
[82]Carneiro (n 9) at 222.

until such leaps are made there is little to be said as regards the original contribution of intelligent interface systems to the field of ODR.

2.2.2. Substitutive AI systems in ODR

Although substitutive AI systems are arguably those which come to mind when AI is discussed (e.g. the 'robot' third party) they are still subject to slow development on account of their relative complexity. It should be noted that although only two main systems are described below, the true breadth of substitutive systems is wider than those described. Any system which could be regarded as truly substitutive would be that one that could combine a number of the systems discussed above and below to form a more complete virtual third party. Nonetheless these 'multi-agent systems' are a while off, since naturally they require not only for their sub-systems to be competent, but also their own internal workings to be developed in order to combine those systems.[83]

2.2.2.1. Case reasoning systems. Case reasoning systems take knowledge of past outcomes and apply it to the situation at hand. Thus, an AI which is aware from past experience or data input that a particular course of action leads to negative outcomes can avoid that course of action.[84] For instance, an AI might avoid suggesting that two divorcing parties simply burn all of their jointly held possessions as a means of ending a protracted settlement process, since it is aware that in the past this has led to low satisfaction levels. There is a clear potential for such systems in the area of ODR, especially where disputes are subject to legal and quasi-legal systems due to the tendency for clear documentation of the facts of cases and statements regarding the exact reasoning behind a certain decision.[85] Thus, a dispute before an AI third party which is similar can be decided in a manner which takes account of the success or validity of previous cases. It should be noted that there is no direct need for such AIs to learn directly – they can be programmed to recognise important variables from the start, as is the case with the *Split-Up* AI.[86] In order to provide suggested divorce settlements, the system looks for the presence of 94 different factors - child care arrangements, income etc. – and then provides suggestions based on the outcome of previous cases which exhibit similar factors.[87]

Although seemingly simple, (after all, traditional third parties rely on their previous experience) there remain significant difficulties in 'teaching' AIs to differentiate between relevant and irrelevant details.[88] Nonetheless, cases of low complexity may well benefit in the near future from such technology: for example an AI working for an online sales platform like Amazon or eBay might realise, via previous feedback on customer satisfaction, that low value disputes regarding items not being sent are far easier settled by quick compensation from its own coffers rather than via protracted investigations into what has actually occurred.[89] The *PERSUADER* system, which deals with

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[83]Carneiro (n 9) at 224.
[84]A Aamodt, E Plaza, 'Case-based reasoning: foundational issues, methodological variations, and system approaches' (1994) 7 AI Communication 39.
[85]Carneiro (n 9) at 223.
[86]Lodder and Zeleznikow (n 56) at 82.
[87]Ibid.
[88]Carneiro (n 9) at 223.
[89]Anna Tims, 'If eBay's customers are always right, who will protect its sellers?' (The Guardian, 2014) <https://www.theguardian.com/money/2014/jul/11/ebay-buyer-complained-decide-against-seller> Accessed 15 September 2021.

labour disputes, retains the results of each case it has dealt with so that it might be more efficient in the future, both in removing the need to evaluate each novel case in its entirety and by employing solutions which have previously been shown to be effective.[90]

2.2.2.2. Rule-based systems. Operating in a similar manner as case-based systems, rule-based systems apply set principles and rules to a given case. This might be a simple matter: e.g. 'IF a party broke a contract term, THEN apply the relevant penalty',[91] 'IF both parties have a predicted satisfaction value >90% THEN provide a conclusive settlement agreement.' It is troubling that such simple examples fail to illustrate the complexities which can occur. For example, what if the issue was of string sales encompassing an array of rules. Nevertheless, systems become exponentially more complex as the number of applicable rules, inputs and outputs increase, creating a system which imitates even a codified set of rules (e.g. statute law, terms of dealing) is no mean feat.[92] Indeed by definition, dispute resolution can be regarded as a matter of conflicting rules – that is to say, each party believes that the best course forward would be what they prefer, based on the circumstances at hand. Nonetheless, decision tree systems have been successful in automating simple financial decisions which previously took quite some time to process manually, such as whether particular parties to a dispute should have access to legal aid[93] or the resolution of low value consumer-supplier disputes.[94] Such systems can also be regarded as extremely useful when the issue is merely presenting the correct template for dispute resolution, as in the case of the *DoNotPay* system, which appeals parking tickets via an automated online process.[95] Such systems can also be valuable to the resolution of commercial disputes. Within *eBay* and *PayPal* a system, *Square-Trade* has been deployed for some twenty years, aiming to filter those complex disputes which require additional third party attention from those which might be more simply solved via automated processes.[96] Thus a case which simply requires a seller to resend an item because they simply forgot to do so can be solved via an automatic but appealable ruling which will in turn free up the resources to deal with convoluted cases involving abstract thought (e.g. a complaint that a purchased sweater is maroon in colour when it was advertised as being burgundy.)

From what has been illustrated, it can be said that AI plays and will continue to play a fundamental role in ODR. However, it must overcome some important obstacles such as the translation issues between parties to a dispute and the machine systems. An attempt is made in the next section to further identify and discuss these issues in order to clearly delineate the role of AI in ODR.

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[90]Lodder and Zeleznikow (n 56) at 82.
[91]Carneiro (n 9) at 226.
[92]Kevin Ashley, Edwina Rissland, 'Law, Learning and Representation' (2003) 150 *Artificial Intelligence* 17-58, 19
[93]Zeleznikow (n 58) at 37–38
[94]Steve Abernathy, 'Building Large-Scale Online Dispute Resolution & Trustmark Systems' (UNECE Forum, 2003) <https://www.mediate.com/Integrating/docs/Abernethy.pdf> Accessed 10 September 2021.
[95]Samuel Gibbs, 'Chatbot lawyer overturns 160,000 parking tickets in London and New York' (The Guardian, 28 June 2016) <https://www.theguardian.com/technology/2016/jun/28/chatbot-ai-lawyer-donotpay-parking-tickets-london-new-york> Accessed 26 September 2021.
[96]Colin Rule, 'Making Peace on Ebay' (2008) *ACResolution* (Online) Available at: http://colinrule.com/writing/acr2008.pdf [Accessed 21 September 2021].

3. AI-ODR and issues of machine translation

A key element of ADR is communication between the parties and commonly a third party facilitating the dispute.[97] Historically, scholars have attributed the success of ADR to face-to-face meetings and open communication between the negotiating parties.[98] The question which then emerges is whether the impersonality of AI in ODR will have a substantial negative effect on the efficacy of the process. This is because although AI can emulate a human, it is at the end of the day only a machine. Therefore, a primary issue facing the use of AI in ODR is human-machine translation.[99] In this regard, this paper places emphasis on AI-ODR which incorporates the AI as a third or fourth party; as opposed to merely supplementing a human third party. Arguably, in the absence of natural language processing and strong machine intelligence,[100] there will remain a problem of translating the inputs necessary for dispute resolution (e.g. desires, statements of facts etc.) into a form that an AI might understand. Further, translating the outputs of an AI third party, back to those that might be understood and accepted by human parties can be problematic. As noted above, this is referred to the issue of the 'fourth party;'[101] which demonstrates that the use of AI may have a palpable effect on dispute resolution proceedings.[102]

In particular, there are three main negative effects that this translation process might have. First, a reliance on AI in ODR will arguably place a limit on the communication that might occur between the negotiating parties. Arguably, where the parties intend to continue business relations, this may be disadvantageous. Second, a fourth party AI system will struggle to deal with certain overt principles which affect the negotiation process. Third, AI will have a normative effect on ODR. These negative effects are discussed and analysed in the next subsections.

3.1. Quantifying qualitative information

It should be noted that questions regarding the wide-spread viability of automated ODR processes are hypothetical. This is due to a tendency to only use semi-automated processes, where abstract questions and disputes have been settled and only financial or numerical issues remain. In other words, AI-ODR tends to be used not to solve disputes, but to deal with distributive problems.[103] For example, the *Family_Winner* system[104] deals with the financial side of divorce settlements; indicating that systems do not solve problems but merely help decide how the "winner" will be treated. Arguably, this demonstrates that AI-ODR systems are currently not sufficiently sophisticated to deal holistically with dispute resolution processes; and that those who employ them are aware of this fact.

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[97]Feliksas Petrauskas and Kybartiene E, 'Online Dispute Resolution in Consumer Disputes' (2011) 18 Jurisprudence 921, 935.

[98]William Zurilla, '*Alternative Dispute Resolution*' (1997) 45 LA Business Journal 352.

[99]James E Cabral and others, 'Using Technology To Enhance Access To Justice' (2012) 26 Harvard Journal of Law & Technology 241 <http://search.ebscohost.com/login.aspx?direct=true&db=a9h&AN=90231665&site=ehost-live>.accessed 26 September 2021.

[100]Soufiane El Jelali, Elisabetta Fersini and Enza Messina, 'Legal Retrieval as Support to EMediation: Matching Disputant's Case and Court Decisions' (2015) 23 Artificial Intelligence and Law 1.

[101]Janet Rifkin, 'Online dispute resolution: Theory and practice of the fourth party' (2010) 19 Conflict Resolution Quarterly 117.

[102]Sela (n 60) at 91.

[103]Petrauskas and Kybartiene (n 97) at 936.

[104]Abrahams, Bellucci and Zeleznikow (n 59) at 3.

Nonetheless, it can be argued that there have been attempts to automate the more abstract or human aspects of dispute resolution. For example, the *SmartSettle* system allows the use of 'satisfaction values.'[105] Consequently, something which would traditionally be regarded as a personal and internal experience can be translated into something which can be grappled with by a machine.[106] Although it might appear that this is a more direct connection between the user and the system, it can be countered that this process does not represent the machine 'understanding' the desires of a human party; rather it is a codification of the avowed human experience that enables the machine to match certain preferences with certain outcomes. There is a vast difference between a mediator understanding a party's desire to, for example, repair a relationship with a previously antagonistic business partner and a system's rating of that desire as a '9/10 priority;' AIs lack the ability to see the qualitative 'worth' of a solution. They cannot consistently use human emotions in a positive way to enhance communication or defuse conflict.

It can be further argued that distributive benefits are only half the story. In a significant number of disputes the parties seek an acknowledgement that they are "right."[107] This highlights one of the major issues facing the use of AI in ODR; namely, that certain desires might not be achievable via the application of AI. Instead, they require direct human interaction. It is notable that regardless of outcome, there is a higher satisfaction level associated with traditional face-to-face ADR than ODR. This is arguably due to the openness and officiousness of the process.[108] It is exacerbated where an individual has hidden values, which an AI machine cannot access or even suspect. As described above, the Israel-Palestine dispute has been subjected to the *Adjusted Winner* system. The solution provided chimes with that provided by some of the foremost experts of the time. Nevertheless, it can be seen that even the most "optimal" solutions were redundant due to subversive human values; for example, an inherent distrust of other parties.[109] This is because rational systems often struggle with irrational values, which could easily be understood by human third party.

Furthermore, it can be argued that in seeking to translate human desires certain desires may be obfuscated by negotiating parties. For example, people are unlikely to openly state their desire to be "right;" fearing that they will be seen egotistical or prejudicial. This is not to say that the in-building of such inputs is impossible. To the contrary, it has been suggested that via the proper inputting of background information on parties, innate desires such as this might be catered for.[110] For example, in order to maintain an even-keeled negotiating environment, a party who is regarded as prone to nervousness might be offered a minor concession on the basis that this will relax their attitude towards future points of dispute.[111] However, the lack of willingness of individuals to be privy to such profiling processes and their concurrent desire to hide information that might aid these processes is

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[105]Carneiro (n 9) at 228.
[106]Ibid.
[107]Thomson Reuters, *The Impact of ODR Technology on Dispute Resolution in the UK* (Thomson Reuters, 2016) 19 Available at: https://blogs.thomsonreuters.com/legal-uk/wp-content/uploads/sites/14/2016/10/BLC_ODRwhitepaper.pdf [Accessed 20 September 2021].
[108]Ibid.
[109]John Zeleznikow, Emilia Bellucci, 'Using Asset Divider to investigate the Israel - Palestinian dispute' (6th International Workshop on Online Dispute Resolution, December 2010) <http://ceur-ws.org/Vol-684/ODR2010proceedings.pdf> accessed 26 September 2021.
[110]Carneiro (n 9) at 237.
[111]Ibid.

arguably a large obstacle to overcome. This is of course not an issue which is inherent to the use of AIs in ODR, but rather a limitation which may be dealt with by human third parties without their explicit knowledge that this is what they are doing.[112]

This issue is further aggravated by the fact that a human needs to enter (and sometimes interpret) the relevant information, regarding the dispute, into AI system.[113] This means that any AI-driven systems operate at the whim of the third-party operator, who will be privy to their own prejudices and failure to notice relevant factors in the parties. Consequently, this will curtail the ability of AIs to render solutions which might be more effective than those noticed by traditional third parties. However, if this can be overcome, AI can introduce 'out of the box' thinking.[114] Nevertheless, the prospect of developing this technology is somewhat of a chicken-and-egg situation. Without sufficient advancement, there is a lack of willingness to use AI-systems on qualitative, rather than quantitative, matters. At the same time, without a will to use AI-systems to address qualitative issues, the avenues for advancement are slim due to a reliance on older models of human-machine interface, which reduces the role of AI in ODR.

3.2. The overarching principal problem

A further translation issue is how over-arching goals might be achieved; for example, "welfare" or "success." Occasionally, disputes require the programming of a stated principle into an AI system. To do this, parameters need to be drafted, above and beyond that which appear in legislation. For example, if Section 1 of the Children Act 1989 ("child's welfare shall be the court's paramount consideration") were to be entered into an AI system, the programmer would need to make value judgments on how to interpret the terms 'welfare' and 'paramount'. This is not to say that the judiciary or a traditional third party do not engage in similar value judgments. However, these value judgements can be considered soft and abstract; whereas to provide hard edges is another matter altogether. Another example is under Section 172 of the Companies Act 2006, which states that "a director of a company must act in the way he considers, in good faith, would be most likely to promote the success of the company for the benefit of its members as a whole." However, success is abstract. It might mean profitability, size, longevity, reputation; all these notions are legitimate, but reasonable people will reasonably disagree on their specific contents. Therefore, asking an AI to act with a quasi-infinite goal in mind is an easy way to render results which can be considered a failure, either because the system can never consider its work to be done, or because the solutions it provides become extreme and absurd.[115] Thus, there may be scenarios which are not suitable for AI-ODR in the near future.

An additional problem is that unwritten rules also govern dispute resolution.[116] For instance, a commercial dispute might revolve around the meta-principle that any

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[112]Peter Guy, 'The biggest limitation of artificial intelligence is it's only as smart as the data sets served' (South China Morning Post, 4 February 2018) <http://www.scmp.com/business/china-business/article/2131903/biggest-limitation-artificial-intelligence-its-only-smart> accessed 12 September 2021.

[113]Petrauskas and Kybartiene (n 97) at 936.

[114]Ibid.

[115]Paul Ford, 'Our Fear of Artificial Intelligence' (MIT Technology Review, 11 February 2015) <https://www.technologyreview.com/s/534871/our-fear-of-artificial-intelligence/> [Accessed 22 September 2021].

[116]Carneiro (n 9) at 226.

resolutions forum should maintain an environment of commercial freedom[117] or the uncodified rule that customer satisfaction is to be maintained, regardless of the validity of their claim. It can be argued that in the absence of efficient machine learning, incorporating these principles into an AI-ODR system would be difficult. Further, it would remove the inherent flexibility currently existing within ADR.

It can also be argued that to regard any advanced AI as having a complete picture of a given dispute would be foolhardy, regardless of how advanced its inputs are. To return to the Israel-Palestine case study above, it was noted by those who used ODR-systems on the dispute that for all the positive impact of the agreement in real life, the surprise assassination of the Egyptian President following the Accords upended their stability. This indicates that even a comprehensive AI-ODR system will be prone to the effects of the 'principle of chaos', just as any traditional third-party resolution.

3.3. The potentially normative effect of AI in ODR

In addition to issues of input, it can be argued that there is significant potential for AIs to have a substantive normative effect on the dispute resolution process. Although a comprehensive description of the normative effects of technology is beyond the scope of this paper, it can be said that the way any given technology operates impacts upon society.[118] For instance, televised media can be said to increase society's awareness of international issues.[119] Arguably, the reduction of traditional negotiation to a numbers game will have potential negative effects. For example, the *Family_Winner* system attempts to take an emotional and personal process and render it mathematical.[120] This can be said to have an effect on the divorce process via the emphasis on the impersonal and the de-emphasis of the personal.[121] That is to say there has been a normative effect caused by the *Family_Winner* system. This is because it has changed the way the parties would ordinarily negotiate. Whether such a normative effect would be positive or negative is subjective. On the plus side, there is a clear benefit to a system being able to de-escalate situations which might be worsened via protracted traditional forms of dispute resolution. For example, it may be able to help reduce the workload of the courts. To the contrary however, there exists a correlation between personal, face-to-face negotiation and long-term satisfaction and conciliation.[122] In short, AIs do not speak 'human' but rather humans are asked to speak 'AI'.

Additionally, it can be argued that the increased use of machine learning in ODR (e.g. the *PERSUADER* labour dispute resolution system)[123] is a clear indication of how these normative processes might be compounded, via the creation of a unique AI 'culture.' If an AI

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[117]Katsh, Rifkin and Gaitenby (n 27).
[118]Tsjalling Swierstra, 'Identifying the normative challenges posed by technology's "soft" impacts' (2015) 9 Nordic Journal of Applied Ethics 5, 14.
[119]Ibid.
[120]Davide Carneiro and others, 'Enriching Conflict Resolution Environments with the Provision of Context Information' (2017) 34 Expert Systems 1.
[121]Thomson Reuters (n 107) at 19.
[122]Jennifer Parlamis, 'Face-to-Face and Email Negotiations: A Comparison of Emotions, Perceptions and Outcomes' (2010, USF: Organization, Leadership and Communication) <https://pdfs.semanticscholar.org/1cb8/b183a5b85c0dbb7cb6b0a90462d8a3a2ab41.pdf> [Accessed 20 September 2021]
[123]Arno R Lodder and John Zeleznikow, 'Developing an Online Dispute Resolution Environment : Dialogue Tools and Negotiation' (2005) 10 Harvard Negotiation Law Review 287.

system is learning from past successes, it is foreseeable that it will develop efficient templates to deal with future disputes. Thus, the AI system will have an incentive to ensure that the disputes that it deals with fit those templates. For example, a scenario can be considered in which a number of workers for a mining company call for a strike, on the basis that the company's healthcare policy does not cover certain industry-related diseases. A well-trained labour dispute AI system might have deduced from previous experience that the most efficient way to deal with labour disputes is to simply offer pay rises. Whereas a traditional third party is likely to recognise the benefit of an expanded healthcare policy. Such an example demonstrates the downside to employing systems which perpetuate a norm of maximised efficiency, unless the norms they create are explicitly resisted, they can have unintended effects.[124]

This is not to say that the creation of certain norms is entirely negative.[125] For example, *eBay's* dispute resolution process solves more than 60 million conflicts a year.[126] Arguably, the quasi-objective nature of its automated ODR processes could be used as an opportunity to defuse previously stressful situations: parties who might be described as "deadbeat buyers" were instead described by their ODR tool as "non-paying bidders."[127] This can be regarded as an example of the static, uncompromising nature of computerised systems conferring an additional benefit to ODR.

3.4. Recommendations regarding issues of machine translation

In the absence of forthcoming intelligent interface systems, there needs to be a significant bridging exercise undertaken by traditional third parties. This will aid the communication process between automated ODR systems and negotiating parties. In the long term, intelligent interface systems will be key to effective ODR processes. This is because this will be the only way that an ODR AI system might become aware of all of the options available to it in solving the dispute at hand.

Furthermore, the issue of AI systems applying overarching principles will require those dealing with a given dispute to reflect upon their own overarching principles, in order to state them in a form which might reasonably be applied by an AI system in an ODR setting. Additionally, many principles will not exist explicitly in legislation and so will require identification and validation before they can be allowed for. This might be a relatively simple process, if the principles are ones which deal with the more concrete aspects of the world. For instance, an AI system settling commercial disputes might need to have in the back of its mind the need to ensure that the UK maintains a competitive business environment.[128] This will require identification and replication within ODR systems. It is, for example, easy to declare justice as being a driving factor of dispute resolution, but it is a different matter altogether to describe the concept in terms that an AI system might understand. In the future, Parliament's input regarding the interpretation of legislation may further facilitate the role of AI in ODR.

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[124]Swierstra (n 118) at 16.
[125]Herm Jooston, Josee Bloemer, Bas Hillebrand, 'The Effects of Third-Party Arbitration: A Field Experiment' (2016) 50 Journal of Consumer Affairs 585.
[126]Katsh, Rifkin and Gaitenby (n 27).
[127]Rule (n 96).
[128]Jordan Daci, 'Legal Principles, Legal Values and Legal Norms: are they the same or different?' (2010) *International Scientific Journal* <http://www.academicus.edu.al/nr2/Academicus-MMX-2-109-115.pdf> [Accessed 21 September 2021].

There is also substantial value in doubting the abilities of AI systems to operate entirely holistically in the case of ODR. As noted above, AI systems are just as prone to the effects of randomness as any traditional third party. Therefore, whilst AI systems might become exceedingly efficient in their processes, they should not be thought of as acting perfectly. In short, the value of proper oversight should not be disregarded, particularly in the field of high-stake negotiation processes.[129]

Finally, there is much to be said for an awareness of the norms that might inadvertently be soft-coded into an AI-ODR system. Rather than blindly accepting the perceived wisdom of AI systems, questions should be asked regularly of the ODR culture that is being created by those AI systems and how that culture is affected by the dispute resolution process. It will also be necessary for such norms to be re-examined at regular intervals. This will ensure that AI systems do not find themselves making faulty assumptions, as a result of their past experiences.[130] Although this "hill-climbing problem" is well known,[131] no substantially developed solution exists. Nonetheless, this is not to say that all norm-setting will be detrimental. As noted above, ODR systems have the potential to deescalate and sanitise those disputes which would proceed negatively in a traditional ADR environment. Further, as long as there is a keen awareness of the effects, the latter can be used for positive ends, not negative.

4. AI and access to justice

As with the development of many new technologies, the development of AI in ODR is ostensibly a process of liberalisation; representing the growth of easier, cheaper and more accessible and efficient resolution processes.[132] However, this assertion can be critiqued as an over simplification of the long-term effects that AI might have within ODR. In fact, it can be asserted that the opposite is true; rather, that the implementation of AI will in fact be detrimental to enhancing access to justice.[133] Arguments regarding this process can be split into two. First, it can be argued that the removal of traditional third parties will have certain positive effects. Second, it can be posited that the nature of AI as a technology will mean that it will create a two-tiered system of dispute resolution. Both perspectives are discussed in more details below.

4.1. The benefits of the dehumanisation of the dispute resolution process

Most new technology is expensive in the early stages of implementation. Therefore, the technology's true potential is not realised, until it is refined and available in cheaper forms. As a result, only the wealthiest organisations benefit from the technology at first. For example, when mobile phones were first introduced, they were for high end businesses,

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[129]Christopher Mims, 'Without Humans, Artificial Intelligence is Still Pretty Stupid' (Wall Street Journal, 12 November 2017) <https://www.wsj.com/articles/without-humans-artificial-intelligence-is-still-pretty-stupid-1510488000> [Accessed 26 September 2021].

[130]Engr. Chijindu, 'Search in Artificial Intelligence Problem Solving' (2012) 5 African Journal of Computing and ICT 37, 38.

[131]Ibid, 38.

[132]Thompson (n 52) at 5.

[133]Suzanne Van Arsdale, 'User Protections in Online Dispute Resolution' (2015) 21 Harvard Negotiation Law Review 109, 109.

long before they became commonplace. It can be argued that will also occur with AI-ODR techniques.[134] Thus, just as state-appointed mediators have been made part of the traditional judicial sphere, it can be predicted that a similar phenomenon will occur with AI-based ODR.[135] This appears more likely when one considers the advantages that the technology might one day have over traditional third parties, such as more effective and swifter communication and costs reduction.

As such, the argument that AI will one day fulfil a demand within ODR is not beyond the imagination. Many individuals find themselves involved in civil disputes, without the ability to pay for the services of a professional advisor (e.g. lawyers, dispute resolution experts).[136] Instead, these disputants are left to either self-represent or refuse to pursue what are often rightful claims.[137] This is aggravated by several factors, including court closures and increased fees.[138] Furthermore, the lack of legal aid is problematic. Unless indigent individuals find themselves lucky enough to receive the services of a *pro bono* lawyer or legal aid (an unlikelihood in the wake of the Legal Aid, Sentencing and Punishment of Offenders Act 2012),[139] their ability to access justice is reduced significantly. This indicates that there exists a gap in the market. Where traditional human actors involved in the dispute resolution process are expensive, AI systems are likely to be relatively cheap after a few years of operation, subject only to maintenance costs, once they have been sufficiently developed.[140]

Moreover, AI in ODR may help an individual receive help finding professional advisors. For example, the *GetAid* system allows the process of applying for legal aid to be automated, freeing up significant resources, which could be deployed elsewhere.[141] There is little to suggest that this process might not occur in all areas of dispute resolution. Labour intensive processes could be undertaken by an AI system, freeing up resources which may be employed elsewhere. Therefore, the resolution process may become cheaper and easier for everyone involved. This is what systems like *Family_Winner* have achieved to a certain extent; lowering the cost of professional divorce settlement to make it available to a wider market. Also, in the case of the ODR systems used by *eBay* and *PayPal*, AI is employed as a means of promoting access to justice for consumers, or traders who would ordinarily not have access to dispute resolution processes.[142] In contrast, if these disputes were solved using traditional methods of dispute resolution, settlement would require more time and effort, wasting important resources. This often leads to litigants having no choice but to lose their claims or opportunities to enforce their rights.[143] It is therefore unsurprising that more than 80% of the disputes that have

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[134]Carrie Menkel-Meadow, 'Ethics in Alternative Dispute Resolution: New Issues, Now Answers from the Adversary Conception of Lawyers' Responsibilities' (1997) 38 *South Texas Law Review* 408, 413.
[135]Jenner (n 54).
[136]Zeleznikow (n 58) at 30-31.
[137]Ibid.
[138]'Access to Justice' (*The Law Society*, 2018) <http://www.lawsociety.org.uk/policy-campaigns/campaigns/access-to-justice/> accessed 22 September 2021.
[139]Catherine McKinnell, 'Lawyers can't be expected to plug the gap in legal aid provision' (The Guardian, 2015) <https://www.theguardian.com/commentisfree/2015/nov/06/lawyers-legal-aid-lawyers-justice> [Accessed 20 September 2021].
[140]Zeleznikow (n 58) at 32-33.
[141]Ibid at 37.
[142]Rule (n. 96).
[143]Lilian Edwards and Ashley Theunissen, 'Creating Trust and Satisfaction Online : How Important Is ADR? The UK EBay Experience' [2006] Connecticut Law Review 1.

been settled by eBay involved the use of an AI software.[144] This evidences the clear poten-
tial of AI in the future of dispute resolution. One may then wonder how many disputes can
be resolved on a daily basis if this technology is developed and rendered available around
the globe.

Arguably, if such technology can resolve the simplest claims, complex cases, which
may normally struggle to receive sufficient court time, will get the diligence they
require. However, this is not without drawbacks. For example, using AI to resolve disputes
relating to minor criminal offences (such as speeding) may certainly reduce the burden on
the courts, but does not enhance the fairness of outcomes. It is likely that many individ-
uals would lack the awareness that by pleading guilty, they would be accepting a criminal
offence on their record. This would be particularly problematic for individuals who are
subjected to DBS checks. As such, the implementation of AI in ODR, must be done with
caution. A similar scenario can be said to have emerged in the public sphere in the
case of the *DoNotPay* service, which subjects simple citizen-government disputes (i.e.
parking tickets) to an automated ODR service.[145] Nonetheless, what these examples
show is that AI in ODR should not be regarded as a complex technology which will even-
tually be simplified for majority use. It is sometimes a 'trickle-up' technology, one that is
relatively simple when applied widely, but might be tailored and developed into more
complex forms for minority use.[146]

4.2. How AI can inhibit access to justice

Whilst it is certainly tempting to regard any new technology with an air of optimism, it is
important to critically analyse the technology's potential and identify any negative impact
upon equality. This allows for calculated measures and safeguards to be implemented to
mitigate the risk of the negative impact.

As such, before AI in ODR is implemented in any jurisdiction, such an analysis must be
undertaken. First, it must be determined whether the minimum level of familiarity and
knowledge has been achieved across the board. As discussed above, there are substantial
barriers to human-AI interfacing, due to the innate translation processes. Thus, in order for
individuals to easily access the services offered by AI in ODR, they would require a sus-
tained ability to interact confidently with modern technology,[147] which is not a given
yet. This may be particularly problematic for the older generation, who may be less com-
puter-literate.[148] As such, for them to truly benefit from AI in ODR, education would be
required. If this education is not provided, an access gap is likely to develop.[149] Therefore,
one might argue that providing access to AI in ODR alone is not enough. For example,
with the UK government's attempts to move towards a digital world, it may leave

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[144]Sanjana Hattotuwa, 'Conversation with Colin Rule, Director of Online Dispute Resolution for EBay and PayPal' (*Ict for Peacebuilding*, 2006) <https://ict4peace.wordpress.com/2006/09/21/conversation-with-colin-rule-director-of-online-dispute-resolution-for-ebay-and-paypal/> accessed 10 September 2021.
[145]Gibbs (n 95).
[146]Jason Kornwitz, 'Why 'trickle-up' innovation may shape the global economy' (Phys.org, 2012) <https://phys.org/news/2012-07-trickle-up-global-economy.html> [Accessed 15 September 2021].
[147]Jenner (n 54).
[148]Ibid.
[149]Runddy Ramilo, 'Critical analysis of key determinants and barriers to digital innovation adoption among architectural organizations' (2014) 3 Frontiers of Architectural Research 431.

behind the 5 million people in the UK who have never used the Internet.[150] Consequently, education must precede deployment to support individuals to engage in the digital world.[151] Thus, if AI-based ODR becomes the primary means of solving disputes, and without any analogue alternative, it may well prevent a certain stratum of society from accessing justice.

It can also be asserted that once AI has been sufficiently developed in the private sphere, a two-tier dispute resolution system may be created. This will be composed of expensive service providers with access to highly efficient AI systems, and cheaper service providers who do not. This is arguably not hard to imagine. For instance, once preliminary supportive AI services are developed in the area of knowledge support, a gap develops between those parties. On the one hand, some individuals have access to AI systems and are able to deal with large amounts of disclosed documents very quickly. In contrast, those who have to deal with that same volume manually are seriously disadvantaged. Jenner describes this as a 'knife to a gun-fight' scenario.[152] If this occurs, particularly in complicated commercial disputes involving many corporations, there may be an inequality of arms; thereby, leading to a scenario where only some parties have access to justice.[153] Arguably, this is likely to be a common feature since the current concentration of AI research related to complex commercial cases suggests an association between the development of AI systems and wealthy commercial firms.[154] For example, Susskind indicates that the 'magic circle' law firms have already signed up and invested with AI provider.[155] In this regard, only those individuals that can afford such law firms will benefit.

Notwithstanding this potential disadvantage, one might argue that it is also a problem with litigation and traditional ADR mechanisms. For example, one party is able to afford a multi-person legal team made up of Queen's Counsel and magic circles lawyers; whilst the other may only be able to afford high-street lawyers. Nevertheless, AI does not make any original significant contribution to dispute resolution if it is unable to overcome common obstacles confronted by litigation and traditional ADR mechanisms. As it stands, an individual can opt for free dispute resolution services (if available, depending upon the law in issue) and thereupon can decide to pay more for better and more comprehensive services – for example by hiring a magic circle law firm to assist in arbitration. The market is on a gradient, with a correlation between quality of outcome and cost of lawyer.[156] As such, as long as an individual or company is of moderate means, they may well be able to afford representation which is commensurate with the value or complexity of the case. In contrast, if a two-tier system develops, there will be a marked difference between those companies that are able to deploy advanced dispute resolution technologies like AI systems and those that cannot. A situation might therefore

[150]Emma Bailey, 'Digital by Deftaul?' (*We are Citizens Advice*, 2018) <https://wearecitizensadvice.org.uk/digital-by-default-e91f6711927> accessed 22 September 2021.
[151]Ibid.
[152]Jenner (n 54).
[153]Richard Chernick, 'ADR Comes of Age' (2004) 4 *Pepperdine Dispute Resolution Law Journal* 187.
[154]Carneiro (n 9) at 219.
[155]Richard E. Susskind, *Tomorrow's Lawyers : An Introduction to Your Future* (OUP 2017).
[156]Chris Hanretty, 'Lawyer rankings either do not matter for litigation outcomes or are redundant' (2016) 23 International Journal of the Legal Profession 185.

develop where the determinative factor, in any given dispute, is not which party is in the right, but rather which party has access to AI technology.

The disparity of a two-tier system might further evolve, via the erosion of those dispute resolution services which are used by those who cannot afford premium providers. Precursor AI systems tend to be employed to deal with those tasks which require less experience: low-level cases, document and case management. These also tend to be those tasks which are performed by junior lawyers or legal assistants, due to the low experience threshold.[157] At the same time there is a tendency for junior lawyers to be the providers of *pro bono* services, due to the correlation between simpler cases and clients who lack means.[158] Complex and high value commercial cases on the other hand tend to involve companies with the ability to pay for the required level of advice. It can therefore be argued that the development of AI in ODR may reduce the availability of *pro bono* advice.[159] This is because there will be a lower demand for junior lawyers, since their functions will be replaced by AI systems.[160] Obviously, there will still be junior lawyers (else how might senior lawyers exist?) but they will, in the future, find themselves operating outside of major firms that can afford AI replacements for their labour. They are likely to instead be part of far smaller satellite firms that are less capable of offering *pro bono* or low cost services.[161] Thus, with the absence of junior lawyers in large firms, the availability of a *pro bono* workforce may be lowered.[162]

It can further be contended that a market dumping phenomenon may occur. AI will be either purposively or inadvertently used to reduce the proportion of the market that *pro bono* or low-cost lawyers hold. At the same time, AI systems can be offered as a replacement for those lawyers; thus, securing the hold of AI upon the market as the primary alternative for those who can only access lower cost or free legal services. Whether such a phenomenon is a concern for access to justice on the whole is dependent on how accessible those replacement AIs are to the average disputant. If access is guaranteed through either charitable intent on the part of the developers or government regulation, then the proposed phenomenon will be of little danger to access to justice. Conversely, if mismanaged, the phenomenon has the potential to affect in a negative manner how the traditionally disempowered access justice.

Even if such a phenomenon does not take place, it can further be contended that by design, it is likely that there will be an emphasis on AI-led ODR dealing with lower value cases. Indeed, this is the future predicted by Lord Justice Briggs in his call for the creation of online court systems, with a financial threshold that must be crossed before access to traditional courts is permitted.[163] This will be of little import if fully competent AI systems are developed which can match those services that might be provided by traditional third

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[157]Art Cockfield et al, 'How will artificial intelligence affect the legal profession in the next decade?' (Queen's University, 2018) <https://law.queensu.ca/how-will-artificial-intelligence-affect-legal-profession-next-decade> [Accessed 20 September 2021].
[158]The Law Gazette, 'Record number of junior lawyers working pro bono' (Law Gazette, 7 November 2013) <https://www.lawgazette.co.uk/practice/record-number-of-junior-lawyers-working-pro-bono/5038629.article> [Accessed 26 September 2021].
[159]Ibid.
[160]Cockfield (n 157).
[161]Ibid.
[162]Jenner (n 54).
[163]Lord Justice Briggs (n 8).

parties. However, there is good reason to believe that there will be a marked difference in the nature of the justice meted out in a two-tier court system such that the message sent is essentially that the progression of a case is dependent not on the notion of justice but rather on the notion of financial value. In other words, although a two-tire court system will facilitate litigation of the larger and complex cases (as courts will essentially deal with such cases), access to justice might become the preserve of the rich, with only an AI facsimile available to the poor.

4.3. Maximising access to justice

It will be important to ensure that access to AI systems is not dependent upon access to technology as a whole. Arguably, this would lead certain users to be disadvantaged. This will require one of two things; either the creation of an intuitive interface which can be utilised by the vast majority, or the deployment of intermediaries to aid communication between clients and AI systems. Obviously, this second solution is not ideal in that it partially counters the major benefit of AI-use: the removal of the time/resource constraints associated with human agents.

Of further interest is the gaps which might open up between parties with access to AI systems and those who do not. This is a difficult problem to solve. On the one hand, the creation of a two-tier system will be detrimental to justice, but on the other hand, it would be an unpalatable state of affairs to curtail the development of important technologies with great promise. Perhaps the most beneficial outcome will be to rely upon the natural processes of technological development to deal with this balance issue. Certainly, those parties which are already advantaged (e.g. wealthier organisations and their clients) will have access to advanced AI technologies before others, but over time it is likely that the technologies will spread and become more prolific at all levels, just as any other computer technology has in the past. Therefore, the most likely outcome is the unsettling observation of disparity at the onset, which then levels off over time. Of greater concern is the fact that changes in legal/ADR/ODR culture might occur as a result of this temporary disparity which may not be rectified in the short term, especially if it is accompanied by the erosion of the role of junior lawyers. In order to ensure that low-cost dispute resolution services are maintained, there will either have to be a renewed commitment of organisations using AI to provide *pro bono* services or a commitment of additional government resources to the legal aid system.

Finally, it is important that AI-based resolution systems are not seen as a cheap and easy way to deal with lower value cases if those AI systems are offering a substantially worse service than their human counterparts might. To do so would be to create a system in which the application of justice is dependent upon one's bank balance.

5. Conclusion

This paper has critically examined the role that AI currently plays in shaping ODR, and how that role might develop in the future to enhance the efficiency of ODR as regards the settlement of legal disputes. It is shown that advances in technology and the continuous increase in transnational transactions interconnecting developed and developing countries will inevitably augment the demand of AI systems to settle disputes.

Historically, AI has played a role in the application of justice, preservation of rights, and the promotion of social values. AI has been described as a phenomenon that shapes the nature of legal discourse in ODR – as a so-called 'fourth party' negotiator. Hence, it is not a mere tool to aid resolution, like a telephone or a calculator, but rather a means of resolution or forum in itself. However, many commentators have observed that AI in ODR has faced the same problem that has beset other applications of AI: slower than expected development. The analysis in this paper therefore posits as a pattern which is true for AI research and implementation: an explosion in optimistic predictions, followed by a recalibration of expectations once the realities of the technology become apparent. However, there is good reason to believe that the ultimate benefit of AI in ODR will be the creation of highly supportive systems which will uncork bottlenecks in the judicial system and replace red tape and litigation with a process that is even more efficient than traditional ADR models. Nonetheless, this will likely result in a two-tiered system of dispute resolution. The consoling prospect is that although wealthier organisations and their clients will have access to advanced AI technologies before others, over time it is likely that the technologies will spread and become more prolific at all levels.

Nonetheless, blind reliance on AI systems could be detrimental if they are not re-examined periodically and regularly. Leaving the wisdom of AI to develop its own parameters on dispute resolution may cause it to drift away from what it was created for in the first place. Accordingly, critical observation of how the AI-based ODR culture evolves is of paramount importance. Another issue that weighs the same if not more to machine translation is if AI-based ODR adversely affects access to justice. Thus, it is imperative that AI-based ODR does not develop into an obstacle that exacerbates the problem of access to justice for the less affluent. Ensuring that AI-based ODR complies with access to justice standards will further enhance its effectiveness and efficiency as a dispute resolution tool or forum.

Disclosure statement