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SMART DISPUTE RESOLUTION IN THE DIGITAL AGE: THE POTENTIAL OF SMART CONTRACTS AND ONLINE DISPUTE RESOLUTION FOR DISPUTE PREVENTION AND RESOLUTION IN CONSUMER LAW CASES

— A.U. Janssen* and Tom J. Vennmanns†

Abstract: *State courts are the traditional and established place to resolve legal disputes. However, litigations are regularly criticized for being lengthy, costly and conducted in an analogue way (eg, by using outdated non-digital technology for communication). Consumers with small claims in particular often regularly refrain from seeking redress as the hurdles state court proceedings entail are disproportionate to the potential outcome. At the same time, the phenomenon of legal tech, which comes primarily from the private legal services sector, shows that the use of digital infrastructure might be a game changer to make legal processes such as contracting, but also dispute resolution, more effective, user-friendly and accessible.*

Here, smart contracts and online dispute resolution processes in particular play an essential role. If smart contract and online dispute resolution (ODR) together form a technically connected entity via a smart contract with an embedded ODR forum clause, the result is, in theory, no less than the digital symbiosis of contract and dispute resolution. This is what we call smart (contract) dispute resolution in a strict sense. However, there is also smart

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dispute resolution inherent in smart contracts due to their feature of being self-executing.

Hence, the smart contract layer itself already entails an (online) dispute resolution respectively avoidance without the express use of an ODR-provision. This is what we call smart (contract) dispute resolution in a broad sense. In this article we will analyze different forms of smart dispute resolution, explain how they work and explore their potential. Could smart dispute resolution be the future of conflict resolution of the 21st century? To answer this question, some potential applications, but also the natural limitations of smart dispute resolution will be discussed.

Keywords: ADR, ODR, Smart Contracts, Smart Dispute Resolution.

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I. INTRODUCTION

A. The Digitization of Law: Almost Nothing is Irreplaceable in a Digitized World

Coco Chanel once said, ‘*Pour être irremplaçable, il faut rester différente*’.¹ This quote not only provides an important formula for entrepreneurial success, but also points to the importance of uniqueness, originality and quality in order for something, whatever it is, to survive and stand the test of time. Living up to this is certainly not easy in an industry like fashion. But also, when we look broadly, today’s life patterns are in such a rapid flux that one has to look closely for sectors and social contexts in which irreplaceable structures are the rule.

Digitalization in particular elucidates us that things can be replaced in a short time, and this trend has been further accelerated by the COVID-19 pandemic. One can think of the widespread use of Zoom to hold the conference that used to be held in the conference room. Or the daily and worldwide use of smartphone apps, which are replacing countless tools like compasses, maps and even pen and paper. So, while many things are still available and used in the analogue² and original version, think for example of a classic compass, a digital solution has often conquered actual mass use. Digitalization apparently changes a lot³ and offers an alternative for everything.

When a legal professional looks at his or her own work environment, he or she is looking at a professional sector that is basically considered traditional and relatively little digitized.⁴ Thus, the legal profession has a reputation for being inflexible to change and rather static. Drawing on studies by *Seligmann*, *Verkuil*, and *Kang*,⁵ *Killian* deduced that many lawyers are anxious when they

¹ Marcel Haedrich, *Coco Chanel Secrète* (Robert Laffont 1971) 308; in English language: *In order to be irreplaceable, one must always be different*.

² The term ‘analogue’ will be used repeatedly in this contribution. In the context of this contribution the term refers to the traditional working methods in legal contexts, such as court procedures with written procedural documents and oral hearings. This is intended to make clear the tension between traditional structures within legal practice and the digital legal tech phenomena.

³ See Jean Tirole, *Economics for the Common Good* (Princeton University Press 2018) 378; Gabriele Buchholtz, ‘Legal Tech - Chancen und Risiken der digitalen Rechtsanwendung’ (2017) *Juristische Schulung* 955.

⁴ Konstantin von Busekist, Philipp Glock and Christian Mohr, ‘The Big Four and the Digital Revolution’ in Markus Hartung, ‘The Digital Transformation’ in Markus Hartung, Micha-Manuel Bues and Gernot Halbleib, *Legal Tech: How Technology is Changing the Legal World: A Practitioner’s Guide* (CH Beck 2018) 82.

⁵ Martin Seligman and others, ‘Why Lawyers are Unhappy’ (2005) 10(1) *Deakin Law Review* 49, 54-55.

engage with their present as professionals or when they look at the future of their discipline.⁶

Even though the basic attitude of many lawyers may have changed little in recent decades, digitalisation has ultimately shown that even the most established structures in the legal system are not so permanently distinctive and without alternative as to be irreplaceable. With regard to various aspects of the law, it can be observed that there is to some extent a struggle between classical legal institutions and dogmatic structures on the one hand and digital alternatives on the other. The emergence of legal tech has recently shown that many aspects of legal practice can be digitized and even automated.

This is consistent with the goal of legal tech, as defined by Bues, ‘legal tech describes the use of modern, computer-aided digital technologies to automate, simplify, and hopefully, improve the process of finding, applying, obtaining, and managing justice through innovation.’⁷ Smart contracts and online dispute resolution (“ODR”) procedures play an important role here. Instead of a traditional contract, smart contracts can digitally recreate contractual legal relationships, algorithmically monitor the fulfillment of terms and automatically trigger execution.⁸

ODR, which is generally seen as a digital form of alternative dispute resolution (“ADR”),⁹ can, among other things, settle disputes at the level of digital

⁶ Matthias Kilian, ‘Die Zukunft der Juristen’ (2017) *Neue Juristische Wochenschrift* 3043.

⁷ Cited in Markus Hartung, ‘The Digital Transformation’ in Markus Hartung, Micha-Manuel Bues and Gernot Halbleib, *Legal Tech: How Technology is Changing the Legal World: A Practitioner’s Guide* (CH Beck 2018) 5.

⁸ For an introduction to the functionality and potential of smart contracts Christina Buchleitner and Thomas Rabl, ‘Blockchain und Smart Contracts’ (2017) *ecolex* 4; Mateja Durovic and André Janssen, ‘Formation of Smart Contracts’ in Larry A. DiMatteo, Michel Cannarsa, Cristina Poncibò (eds), *The Cambridge Handbook of Smart Contracts, Blockchain Technology and Digital Platforms* (Cambridge University Press 2019) 61; Markus Kaulartz and Jörg Heckmann, ‘Smart Contracts - Anwendung der Blockchain-Technologie’ (2016) *Computer und Recht* 618; Markus Kaulartz, ‘Herausforderungen bei der Gestaltung von Smart Contracts’ (2016) *Zeitschrift zum Innovations- und Technikrecht* 201; Reggie O’Shields, ‘Smart Contracts: Legal Agreements for the Blockchain’ (2017) 21 *North Carolina Banking Institute* 177; Eric Tjong Tjin Tai, ‘Juridische aspecten van blockchain en smart contracts’ (2017) 54 *Tijdschrift voor Privaatrecht* 563; Eric Tjong Tjin Tai, ‘Smart contracts en het recht’ (2017) *Nederlands Juristenblad* 146; Kevin Werbach and Nicolas Cornell, ‘Contracts Ex Machina’ (2017) 67 *Duke Law Journal* 313.

⁹ Karolina Mania, ‘Online Dispute Resolution; The Future of Justice’ (2015) 1 *International Comparative Jurisprudence* 76, 78; Pablo Cortés, ‘Factsheet: What Should the Ideal ODR System for E-Commerce Consumers Look Like? The Hidden World of Consumer ADR: Redress and Behaviour’ (Centre for Socio-Legal Studies Oxford 2011) <https://www.law.ox.ac.uk/sites/files/oxlaw/dr_pablo_cortes.pdf> accessed 9 July 2021.

platforms and through online interfaces,¹⁰ offering an alternative to dispute resolution in state courts. These phenomena increasingly challenge the existence and benefits of analog-traditional models of contracting and dispute resolution. Moreover, they seem to be increasingly capturing the legal services market. This follows from several studies. In a 2015 study for Altman Weil, *Seeger and Clay* found that the increased use of legal tech offerings in the U.S. legal services market has resulted in a significant loss of revenue for traditional law firms.¹¹ In 2016, a joint study by the Boston Consulting Group and Bucerius Law School found that law firms can no longer afford to ignore legal tech.¹²

There is a tendency for fewer and fewer cases to be brought before the courts.¹³ In 2015, to take the example the Netherlands, the Dutch judiciary registered 1.67 million incoming cases.¹⁴ In 2019, it was only 1.54 million cases.¹⁵ There is a remarkable decline of 7.8% in four years.¹⁶ In other countries such as Germany or the USA a similar trend can be observed. In contrast, the number of ODR users across the world is clearly increasing. eBay's ODR process is the most successful and widely used ODR system in the world.¹⁷ For example, more than 60 million disputes are submitted to eBay's ODR process worldwide each year.¹⁸ Further research should show whether there is a causal link between the emergence of ODR and the decrease in the number of cases coming before the courts. Nevertheless, it seems justified to suspect that the ODR is at least an important reason for this.

¹⁰ Pablo Cortés, *Online Dispute Resolution for Consumers in the European Union* (Routledge 2010) 2.

¹¹ Cited in Jelle van Veenen and Joost Schmaal, 'Legal tech en de advocatuur' (2018) *Computerrecht* 54.

¹² *ibid*; Christian Veith and others, 'The Boston Consultancy Group and Bucerius Law School: How Legal Technology Will Change the Business of Law' (Research Report 4, 2016).

¹³ Since the authors work at the Dutch Radboud University and are also both German lawyers, this article will increasingly work with examples from the German and Dutch legal system. However, the phenomena discussed are also visible globally and the concrete examples only serve as a more concrete reference for developments visible worldwide.

¹⁴ Annual Report of the Dutch Judiciary 2019/20 <<https://www.jaarverslagrechtspraak.nl/wp-content/uploads/2020/04/Jaarverslag-Rechtspraak-2019.pdf>> accessed 9 July 2021.

¹⁵ *ibid*.

¹⁶ This tendency also exists in many other countries.

¹⁷ Edwin Montoya Zorrilla, 'Towards a Credible Future: Uses of Technology in International Commercial Arbitration' (2018) *Zeitschrift für Schiedsverfahren* 106, 109.

¹⁸ *ibid*.

B. Smart Dispute Resolution: The Swiss Army Knife of Dispute Resolution of the Future?

Legal tech is about creating efficient and smart digital solutions to legal challenges.¹⁹ The demand for greater efficiency has also given rise to the practical phenomenon of smart contract dispute resolution,²⁰ which is the central subject of this contribution. The term ‘smart contract dispute resolution’ has emerged relatively recently. Most authors associate the term with the dispute resolution opportunities that arise from smart contract issues.²¹ However, the use of this terminology suggests that the use of smart contracts can only lead to conflicts that need to be resolved.

However, this terminology denies that hidden in the characteristic features of smart contracts is the fundamental potential to avoid conflicts on a large scale. Therefore, we decided to use a terminology that has hardly been used so far, and that brings together these two sides, both of *conflict avoidance* through the deployment of smart contracts, and of *conflict resolution* of disputes arising from the use of smart contracts. The term smart dispute resolution seems to us to be an appropriate designation, even though for the purposes of this contribution we further distinguish between smart dispute resolution in a strict sense and in a broad sense.

(a) *Smart Dispute Resolution in the Strict Sense*

If smart contract and ODR procedures together form a technically connected entity, the result is, in theory, no less than the digital symbiosis of contract and conflict resolution. In other words, it involves the technical connection of two normally separate levels of law. Strongly simplifying, it can be said that a potential dispute surrounding a smart contract will be routed directly to the ODR procedure via a clause in the smart contract so that it can be resolved as effectively and quickly as possible (*smart dispute resolution in the strict sense*). There are already legal tech companies that are realizing this

¹⁹ With a view to greater efficiency Susanne Hähnchen and others, ‘Legal Tech’ (2020) 60(7) *Juristische Schulung* 626.

²⁰ Markus Kaulartz, ‘Smart Contract Dispute Resolution’ in Matthias Fries and others (eds), *Smart Contracts* (Mohr Siebeck 2019) 73-74.

²¹ See Amy Schmitz and Colin Rule, ‘Online Dispute Resolution for Smart Contracts’ (2019) *Journal of Dispute Resolution* 104; Markus Kaulartz, ‘Smart Contract Dispute Resolution’ in Matthias Fries and others (eds), *Smart Contracts* (Mohr Siebeck 2019) 73; Michael Buchwald, ‘Smart Contract Dispute Resolution: the Inescapable Laws of Blockchain-Based Arbitration’ (2020) 168 *University of Pennsylvania Law Review* 1369.

technical connection of smart contract and ODR.²² The technical feasibility of this will be discussed in more detail at a later stage.

(b) Smart Dispute Resolution in a Broad Sense

One could also argue that smart contracts, even without such an ODR clause, already involve the element of (online) dispute resolution and even online *dispute avoidance*, respectively, because of their inherent element of self-execution (*smart dispute resolution in the broad sense*).

What would the widespread use of these technically advanced forms of dispute avoidance and resolution mean for legal practice? Is this the revolution and answer for dispute resolution in the 21st century, the Swiss army knife of dispute resolution of the future? This is the central research question of this contribution. We focus primarily on smart dispute resolution in the strict sense (called smart contract dispute resolution by other authors), but Chapter 3.2. broadens the perspective again and examines smart dispute resolution in the strict *and* broad sense.

The next chapter discusses the criticism to state courts and as a ‘counterpoint’ the emergence of legal tech solutions, and here especially ODR procedures. The third chapter then focuses on the connection of smart contracts and ODR procedures (ie, on the possibilities and also the limitations of smart dispute resolution). The contribution concludes with a conclusion and future perspective for this legal phenomenon.

II. CONFLICT RESOLUTION IN THE 21ST CENTURY

A. Criticism to State Courts

The range of alternative dispute resolution options such as arbitration is growing and more and more litigants seem to be taking advantage of these options.²³ These alternatives are no longer only used for business-to-business disputes (“B2B”), but also increasingly for business to consumer disputes (“B2C”).²⁴ On the other hand, the number of proceedings is decreasing, as mentioned above, in the state courts. There are several reasons for this. Empirical studies of the Dutch judiciary from 2018 have shown that the

²² Amy Schmitz and Colin Rule, ‘Online Dispute Resolution for Smart Contracts’ (2019) *Journal of Dispute Resolution* 116.

²³ Eddy Brauw and others, *Rechtsstatelijke waarborging van buitengerechtelijke geschiloplossing* (Boom juridisch 2018) 17-18.

²⁴ Farzaneh Badiel, ‘Using Online Arbitration in E-Commerce Disputes: A Study on B2B, B2C and C2C Disputes’ (2015) *International Journal of Online Dispute Resolution* 103.

trade-off between costs and benefits is an important reason for many litigants to avoid going to government courts.²⁵ For disputes up to €500 in value, the court fee of the Dutch subdistrict court is already €85.²⁶

Many litigants also need a lawyer or legal advice and there is the emotional burden of litigation, which many people shy away from. Moreover, in the Netherlands, the losing party does not always bear the full litigation costs. The problematic nature of these financial aspects is underscored by a 2011 ruling of the Rotterdam District Court (location Brielle), which sends a problematic message to all litigants with small claims.²⁷ Here, the plaintiff's claim included an amount of €422.91. Although the plaintiff won the case, the court ruled that he had to bear his own litigation costs. These own costs consisted of court fees of €426 and service costs of €97.81. In this case the plaintiff opted in advance for an out-of-court collection, but broke off this process prematurely.²⁸

The court reasoned this decision with the expectation that the plaintiff - in view of the relationship between the claim and the legal costs - would make a more serious financial assessment before proceeding to sue.²⁹ With a judgment like this, litigants with small claims get the message that the state is not really interested in resolving those disputes.

Apart from these economic factors, state procedures are repeatedly criticized for taking too long. Even if, eg, the vast majority of proceedings in the Netherlands and also in many other EU countries such as eg, Germany meets the requirements of art 6 of the ECHR in view of the allowed duration, this legal assessment is independent of the subjective experience of the parties. In the context of the *Roland Rechtsreport 2020* of the *Allensbach Institut*, German citizens were asked what they think of the duration of proceedings before courts. 85% of citizens think that procedures in Germany take too long and almost as many citizens (83%) think that courts are overloaded.³⁰

We also find this opinion in the Netherlands, and here it is even the judiciary itself that expresses such criticism. *Dineke de Groot* (President of the Supreme Court since 2020), already expressed her opinion on the slowness

²⁵ See Council for the Judiciary, (Research Memorenda 3/2018) <<https://www.rechtspraak.nl/SiteCollectionDocuments/RM-2018-3.pdf>> accessed 9 July 2021.

²⁶ Annex to the Dutch Civil Court Fees Act (*Wet griffierechten burgerlijke zaken*).

²⁷ Rechtbank Rotterdam (Court Location Brielle) 20 December 2011, *De Praktijkids* 2012/148 (ECLI:NL:RBROT:2011:BV7067).

²⁸ *ibid* para 4.5.

²⁹ *ibid*.

³⁰ *Roland Rechtsreport 2020* (2020) 7 <https://www.ifd-allensbach.de/fileadmin/IfD/sonstige_pdfs/ROLAND_Rechtsreport_2020.pdf> accessed 9 July 2021.

of civil proceedings in 2017.³¹ In the 2019 *Final Report Project Procedural Duration of the Judiciary*, the Dutch judiciary points out, that research shows that litigants have a need for faster procedures.³² *Groenewald* examined many possible reasons for this slowness in 2018.³³ These include overburdened courts, which have to deal with a lot of chanceless disputes, and the declining ability of Dutch people to resolve disputes by themselves.³⁴

A final central element of the criticism of the public justice system concerns the problem of accessibility in a digitised world as the digitisation of justice and legal practice has not progressed beyond approximations and pilot projects in some areas and jurisdictions.³⁵ Often procedures are still settled according to analogue methods, which reinforces the previous points of criticism - the long procedures, too high costs and lack of effectiveness. In general, old-fashioned means such as faxes still dominate traditional court procedures, while they are hardly used outside the courtroom.

Also, in many jurisdictions around the world, the processing of digital files in court exceeds current technical capabilities and the pandemic has shown that digital infrastructure is important to maintaining essential day-to-day processes.³⁶ Also considering the last point, the reluctance to digitize the judiciary is remarkable. In the Netherlands, the KEI project (*Project Quality and Innovation of the Judiciary*) sought to digitize the judicial system more pragmatically and quickly.

The project began in 2013 and provides for, first, the digitization of the civil justice system, and second, related to that, the necessary revisions of (among others) the Code of Civil Procedure.³⁷ However, the €200 million project turned out to be flawed in its implementation, so much so that in 2018, the year when fully electronic communication with the courts should have been possible, the literature itself spoke of the KEI debacle.³⁸

³¹ Tosca Ten Kroode and others, 'Afscheid van ee klassieke procedure?' (2017) *Nederlands Juristenblad* 1514.

³² *Final Report Project Procedural Duration of the Dutch Judiciary 2019*, 113 <<https://www.rechtspraak.nl/SiteCollectionDocuments/eindrapport-doorlooptijden-in-beweging.pdf>> accessed 9 July 2021.

³³ Edo Groenewald, 'De traagheid van het civiele geding' (2017) *Nederlands Juristenblad* 260.

³⁴ *ibid.*

³⁵ Frank Zschieschack, 'Zivilverfahren in Zeiten des Coronavirus' in Hubert Schmidt (ed), *COVID-19 - Rechtsfragen zur Corona-Krise* (CH Beck 2020) para 1.

³⁶ Peter Schrader, 'Wie verändert sich die Arbeit des Anwalts durch die Corona-Krise?' (2020) *Neue Zeitschrift für Arbeitsrecht* 571.

³⁷ *Dutch Parliamentary Papers II* 2014/15, 34 059, no 1-4.

³⁸ Paul Bovend' Eert, 'Is de Nederlandse rechterlijke macht een inferieure staatsmacht?' (2018) *Nederlands Juristenblad* 2299.

Although the KEI has been replaced by a new digitization project, called project Digital Accessibility,³⁹ this project is also already experiencing delays.⁴⁰ In summary, therefore, it can be concluded that judges are still working in principle ‘analogue’. The lack of digitalization of the Dutch courts becomes especially clear when looking at the current *EU Scoreboard of Justice 2020*. Regarding⁴¹ the category ‘submitting and following a claim online’, the Netherlands is in third last place of all EU countries.⁴²

B. Entrepreneurship Conquers the Legal Services Sector: Conflict Resolution by the Private Sector

This section will look at the phenomenon of legal tech in general and of ODR procedures in particular, which can be understood as private sector initiatives to create practical dispute resolution tools.⁴³

(a) New Actors and Digital Solutions by the Legal Services Sector (Legal Tech)

Legal tech is the term that summarizes private sector initiatives in legal contexts of the digital age. The term refers to the use of digital technology and software to provide legal services and support legal processes such as, for example, litigation, document review, legal advice by lawyers et cetera.⁴⁴ The goal of legal tech is to make law enforcement and legal practice more effective, affordable and accessible.⁴⁵ Legal tech tools emerge not only because advancing digital technologies offer new opportunities, but also because there is money to be made from them.⁴⁶

This is done not only by selling the new software and digital infrastructure to the judiciary, the legal profession and other companies, but also especially by offering it to a wide audience of individuals.⁴⁷ Legal tech-entrepreneurs try to design smart digital tools that offer an alternative to the traditional offerings of the legal services market. Numerous legal tech start-ups have now

³⁹ See Dutch Parliamentary Papers 29279, no 623.

⁴⁰ ‘Opvolger KEI loopt nu al vertraging op’ (*Mr. Online*, 7 June 2019) <<https://www.mr-online.nl/opvolger-kei-loopt-nu-al-vertraging-op/>> accessed 9 July 2021.

⁴¹ EU-Scorebord of Justice 2020 <https://ec.europa.eu/info/sites/info/files/justice_scoreboard_2020_en.pdf> accessed 9 July 2021.

⁴² *ibid.*

⁴³ Gabriele Buchholtz, ‘Legal Tech - Chancen und Risiken der digitalen Rechtsanwendung’ *Juristische Schulung* 2017.

⁴⁴ Susanne Hähnchen and others, ‘Legal Tech’ (2020) *Juristische Schulung* 626.

⁴⁵ *ibid.* 630.

⁴⁶ Susanne Hähnchen and others, ‘Legal Tech’ (2020) *Juristische Schulung* 626, 630.

⁴⁷ *ibid.*

established themselves in the market⁴⁸ and many large law firms with sufficient financial resources are using or even co-developing the products of these providers.⁴⁹ In the Netherlands, there has traditionally been a strong market position of legal service providers outside the legal profession. According to some studies, they hold two-thirds of the market.⁵⁰ It is therefore not surprising that legal tech is finding fertile ground.

(b) Online Dispute Resolution: The Substitutability of Statewide Conflict Resolution

1. The Features and Ways of Applying ODR

A subcategory of legal tech that focuses on improving dispute resolution and access to justice are ODR procedures. In general, ODR procedures are a way of resolving disputes in a digital environment or on the Internet.⁵¹ Through digital solutions, a kind of digital forum is created in which a resolution of a legal dispute takes place, just like in a classic court procedure or a physically taking place arbitration procedure. According to a broad definition, ODR can be described as the use of an online environment to facilitate communication and dispute resolution.⁵²

According to a narrower and more conventional definition, ODR can be seen as a process that ‘uses the Internet as a more efficient medium for parties to resolve their disputes’.⁵³ According to this approach, ODR serves as an alternative to state courts.⁵⁴ Others consider ODR to be a counterpart of offline dispute resolution and not a counterpart to judicial dispute resolution in the sense of ADR.⁵⁵ The advantage of this view of ODR is that it does not pre-

⁴⁸ See Legal Tech Map the Netherlands <<https://www.legaltechmap.nl>> accessed 9 July 2021 and Legal Tech in Germany <<https://tobschall.de/legaltech/>> accessed 9 July 2021.

⁴⁹ Jelle van Veenen and Joost Schmaal, ‘Legal tech en de advocatuur’ (2018) *Computerrecht* 54.

⁵⁰ Matthias Kilian, ‘Rechtsberatungsmonopol, Rechtsschutzversicherung und Kostenerstattung in den Niederlanden’ (1999) *Zeitschrift für die gesamte Versicherungswissenschaft* 44.

⁵¹ Pablo Cortés, *Online Dispute Resolution for Consumers in the European Union* (Routledge 2010) 2.

⁵² Nicolas Vermeys and Karim Benyekhlef, ‘ODR and the Courts’ in Mohamed and others (eds), *Online Dispute Resolution: Theory and Practice: A Treatise on Technology and Dispute Resolution* (Eleven International Publishing 2012) 307.

⁵³ Nicolas Vermeys and Karim Benyekhlef, ‘ODR and the Courts’ in Mohamed and others (eds), *Online Dispute Resolution: Theory and Practice: A Treatise on Technology and Dispute Resolution* (Eleven International Publishing 2012) 307-308.

⁵⁴ See Karolina Mania, ‘Online Dispute Resolution and The future of Justice’ (2015) *International Comparative Jurisprudence* 78; Nicolas Vermeys and Karim Benyekhlef, ‘ODR and the Courts’ in Mohamed and others (eds), *Online Dispute Resolution: Theory and Practice: A Treatise on Technology and Dispute Resolution* (Eleven International Publishing 2012) 307-308.

⁵⁵ *ibid* 307-309.

clude courts from using ODR interfaces as well.⁵⁶ And this is probably more in line with current reality, as more and more courts worldwide are using ODR in the context of the so-called Online Courts.⁵⁷

ODR can be a promising option for improving the redress of consumers' claims, enhancing their confidence in the market, broadening access to justice/conflict resolution and promoting the sustainable growth of e-commerce.⁵⁸ ODR may offer the possibility of resolving domestic and cross-border disputes of limited financial significance, which otherwise could not be easily solved in the light of consumers' rational apathy.⁵⁹

2. Application Examples of ODR

The final structure and working methods of ODR procedures are multifaceted and therefore a complete description of all the different procedures is unfortunately not possible in the context of this contribution. A simple example is the ODR infrastructure of eBay already mentioned. Functionally, most disputes here are resolved through computer-assisted negotiations in which the parties can reach a solution themselves, but parties can, for a small additional fee, engage a human mediator to help resolve the dispute.⁶⁰

Another example of online dispute resolution is Cyber Settle, which claims to have facilitated 100,000 transactions representing more than \$750 million in settlements between 1998 and 2005.⁶¹ Operating since 1998, the ODR platform facilitates negotiations to resolve insurance and commercial disputes. Parties make confidential bids that are made public only when both bids meet certain standards or a certain amount of money. The settlement amount is the midpoint of the two bids.⁶² These private sector examples reflect the general nature and current use of ODR procedures.

⁵⁶ Gabrielle Kaufmann-Kohler and Thomas Schultz, *Online Dispute Resolution: Challenges for Contemporary Justice* (Kluwer Law International 2004) 6.

⁵⁷ See for instance Richard Susskind, *Online Courts and the Future of Justice* (Oxford University Press 2019); David Larson, 'Designing and Implementing a State Court ODR System: From Disappointment to Celebration' (2019) 2 *Journal of Dispute Resolution* 77.

⁵⁸ Pablo Cortés, 'Factsheet: What Should the Ideal ODR System for E-Commerce Consumers Look Like? The Hidden World of Consumer ADR: Redress and Behaviour' (Centre for Socio-Legal Studies Oxford 2011) <https://www.law.ox.ac.uk/sites/files/oxlaw/dr_pablo_cortes.pdf> accessed 9 July 2021.

⁵⁹ Pablo Cortés, *Online Dispute Resolution for Consumers in the European Union* (Routledge 2010) 2.

⁶⁰ Edwin Montoya Zorrilla, 'Towards a Credible Future: Uses of Technology in International Commercial Arbitration' (2018) *Zeitschrift für Schiedsverfahren* 106, 109.

⁶¹ Bruno Deffains and Yannick Gabuthy, 'Efficiency of Online Dispute Resolution: A Case of Study' (2005) 60 *Communications & Strategies* 205.

⁶² Pablo Cortés, 'Factsheet: What Should the Ideal ODR System for E-Commerce Consumers Look Like? The Hidden World of Consumer ADR: Redress and Behaviour' (Centre for

The growing market share and the emergence of start-ups and the hundreds of thousands of daily users as in the case of eBay show that ODR procedures can indeed offer a digital and private alternative to solve (small and smallest) disputes and thus address the problem of rational apathy (especially of consumers). ODR procedures are thus no longer a theoretical phenomenon, but a practical reality. ODR procedures may in principle offer a good digital solution for low-threshold, efficient and relatively inexpensive dispute resolution for certain disputes.

But could the barriers for the litigant perhaps be lowered even further? Especially for disputes with small claims and manageable complexity? Could it conceivably be that the injured party with a small financial claim would not have to take any significant steps and efforts at all to resolve their legal dispute? One possible answer to this question might be the concept of smart dispute resolution. In the next section, we will elaborate on this and explain the method and possible areas of application.

III. ONE-IN, TWO-OUT: THE DIGITAL CONNECTION OF UNDERLYING LEGAL RELATIONSHIP AND CONFLICT RESOLUTION

A. The Potential of Smart Contracts for Managing Legal Relationships

Smart contracts are on everyone's lips and have become increasingly important in past few years. Smart contracts technically work regularly based on blockchains, also called distributed ledgers, which are touted as a technology that can revolutionize business practices and contract law.⁶³ Smart contracts are an example of using technology to improve or even replace traditional institutions and to partially replace human and therefore subjective decision-making with algorithms.⁶⁴

There are numerous definitions of smart contracts. The U.S. National Institute of Standards and Technology describes a smart contract as a 'collection of code and data (sometimes referred to as functions and state) that is deployed using cryptographically signed transactions on the blockchain network.'⁶⁵ Although no universal definition for blockchain exists either, *Mik*

Socio-Legal Studies Oxford 2011) <https://www.law.ox.ac.uk/sites/files/oxlaw/dr_pablo_cortes.pdf> accessed 9 July 2021.

⁶³ Markus Kaulartz and Jörg Heckmann, 'Smart Contracts - Anwendung der Blockchain-Technologie' (2016) *Computer und Recht* 618.

⁶⁴ Eliza Mik, 'Smart Contracts: A Requiem' (2019) *Journal of Contract Law* 1.

⁶⁵ Dylan Yaga and others, 'Blockchain Technology Overview' (NISTIR Internal/Interagency Report 820254, 2018).

summarizes the basic functions of the blockchain as a decentralized, peer-validated, cryptographic database that is publicly visible and allows for the chronological and permanent recording of past transactions.⁶⁶ The standard example of a blockchain application is the cryptocurrency Bitcoin (or similar cryptocurrencies).

All participants (nodes) form a digital network (peer-to-peer network). During a transaction, the users must check and verify the correctness of the transfer in order for it to be successful. When a new data file (block) is added, it always refers to the previously stored data file, creating a chain.⁶⁷ At the same time, the use of asynchronous encryption and signature mechanisms technically ensures that data (or stored program codes), once stored in the blockchain, cannot be modified by individual participants.⁶⁸

The combination of peer-to-peer networks and cryptographic technologies ensures that such transfers are immediately recorded and visible to all.⁶⁹ This makes the blockchain a distributed system which has an advantage over a centralised system controlled by only one party. It is more transparent and auditable and less susceptible to fraud and manipulation. A smart contract is different from the blockchain, but technically it works mostly through the digital structure of the blockchain.⁷⁰ Thus, the advantages just described also apply to it, such as less susceptibility to manipulation and more transparency, since it is based on verifiable electronic protocols.

The basic idea behind smart contracts is to map a contract as programme code. The programme code runs for the duration of the contract and automatically performs actions, in particular payment transactions, when certain conditions arise.⁷¹ In addition to the blockchain technology already described, the focus is on the use of contract ware, which allows analogue contracts to be converted into digital programmes.⁷² The complexity and technical maturity of blockchain and contractware determine how detailed a contractual relationship can be represented digitally and which contract parameters are controlled or covered by the smart contract.⁷³ By its nature, a smart contract can only han-

⁶⁶ Eliza Mik, 'Smart Contracts: A Requiem' (2019) *Journal of Contract Law* 2.

⁶⁷ Klaus Eschenbruch and Robert Gerstberger, 'Smart Contracts' (2018) *Neue Zeitschrift für Baurecht und Vergaberecht* 3.

⁶⁸ *ibid.*

⁶⁹ Eliza Mik, 'Smart Contracts: A Requiem' (2019) *Journal of Contract Law* 2.

⁷⁰ *ibid.*

⁷¹ Klaus Eschenbruch and Robert Gerstberger, 'Smart Contracts' (2018) *Neue Zeitschrift für Baurecht und Vergaberecht* 3.

⁷² *ibid.*

⁷³ Eliza Mik, 'Smart Contracts: A Requiem' (2019) *Journal of Contract Law* 2; Klaus Eschenbruch and Robert Gerstberger, 'Smart Contracts' (2018) *Neue Zeitschrift für Baurecht*

dle digitally mapped outcomes; for all other data, the smart contract is blind. The interface between the real world and the smart contract is called oracle.⁷⁴ They provide the smart contract with necessary outside information, such as the current price of a cryptocurrency.

Without going into too much technical detail, a concrete example of a smart contract will be given to provide more practical understanding. For example, a smart contract could be applied to conclude and digitally verify a car insurance contract. In the case of a modern car that is connected to the Internet (eg, a Tesla), the mileage and annual mileage could be digitally transmitted to the smart contract. Depending on the mileage, a lower or higher premium would then apply (following the principle: pay as you drive smart contract). The smart contract could also be linked to the driver's bank account or cryptocurrency wallet so that the money owed for insurance is automatically transferred to the insurer. This example highlights the key features and advantages of smart contracts over traditional contracts. They can independently control the contractual terms, and automatically proceed to the execution of the contract terms. Therefore, the widespread use of smart contracts could have clear economic implications.

B. Smart Dispute Resolution: The Digital Symbiosis of Agreement and Conflict Resolution

Let us now focus on the next step, namely the potential regarding dispute prevention and dispute resolution when deploying ODR and smart contracts (ideas previously defined as smart dispute resolution). In the following, two conceivable 'levels' of dispute resolution in the context of smart dispute resolution will be discussed, with examples of what they might look like in practice. The first level is dispute resolution through a dispute avoidance mechanism based on the automatic execution of smart contracts (*smart dispute resolution in a broad sense*), the second level to be discussed here is the use of forum selection clauses in a smart contract for an ODR procedure in the event of a dispute arising from the deployment of the smart contract (*smart dispute resolution in a strict sense*).

und Vergaberecht 3.

⁷⁴ Markus Kaulartz and Jörg Heckmann, 'Smart Contracts - Anwendung der Blockchain-Technologie' (2016) *Computer und Recht* 619.

(a) *Automatic Execution of Smart Contracts: Dispute Prevention (Smart Dispute Resolution in a Broad Sense)*

The simplest form of smart dispute resolution can already be seen in the functionality of automatic execution of a smart contract itself. The following example will illustrate this. In order to provide air passengers with a minimum level of protection, the European Parliament and the Council adopted Regulation (EC) No. 261/2004 (the so-called Regulation on the Rights of Air Passengers). In the event of a delay of more than three hours or a cancellation of a flight, the passenger is entitled to compensation.⁷⁵ The EU Regulation uses fixed amounts between €250 and €600 for this purpose.

Despite the existence of this actually comfortable legal situation, hundreds of thousands of airline passengers refrain from enforcing their legitimate claims and airlines refuse to pay compensation *en masse*.⁷⁶ Many airlines take advantage of the rational apathy of air passengers, because the amounts of compensation are often perceived by them as too low to really start litigating. Even when passengers actually confront the airlines with their claims, they often speculate that the passengers will ultimately go to court.⁷⁷

Thus, what should in principle accrue to passengers without question (unless no special circumstances under art 5(3) of Regulation 261/2004 are present) remains widely with the wrongfully acting parties, the airlines. *Tavakoli* concludes that many passengers are deterred by the idea - especially without legal expenses insurance - of taking legal action against a major airline and initially paying the legal costs.⁷⁸ The European Court of Auditors aptly summarizes this shortcoming in a special report by pointing out that 'EU passenger rights are comprehensive but passengers still need to fight for them.'⁷⁹

To sum up, the situation is almost 'tailor-made' for the airlines. They are aware that passengers often have no choice but to go to court in order to enforce their rights effectively. The associated costs of court fees and lawyers' charges, the expected duration of the proceedings and the emotional burden are

⁷⁵ Art 7, Regulation 261/2004; ECJ EU 19 November 2009, ECLI:EU:C:2009:716 (*Sturgeon*).

⁷⁶ European Court of Auditors, *Special Report (Pursuant to Article 287(4), Second Subparagraph, TFEU)* (2018) <https://www.eca.europa.eu/Lists/ECADocuments/SR18_30/SR_PASSENGER_RIGHTS_EN.pdf> accessed 9 July 2021.

⁷⁷ Henning Hofmann and Rebecca-Sophia Scheu, 'Fluggastrechte auf dem Prüfstand' (2015) *Verbraucher und Recht* 369.

⁷⁸ Anusch Tavakoli, 'Automatische Fluggast-Entschädigung durch Smart Contracts' (2020) *Zeitschrift für Rechtspolitik* 46.

⁷⁹ European Court of Auditors, *Special Report (Pursuant to Article 287(4), Second Subparagraph, TFEU)* (2018) <https://www.eca.europa.eu/Lists/ECADocuments/SR18_30/SR_PASSENGER_RIGHTS_EN.pdf> accessed 9 July 2021.

often so disproportionate to the cost of the ticket that passengers often refrain from going to court after all.

This problem could be solved with smart contracts. The smart contract could digitally monitor flight delays and cancellations through an oracle, just as they can be found in real time on the Internet. If the smart contract is connected to the bank account or wallet of the passenger and the airline, it could automatically transfer the compensation amounts owed to the passenger from the airline's account to the passenger's account if the requirements of Regulation 261/2004 are met. This mechanism would eliminate the problem of rational apathy in Europe in the contexts described. This would be a digital and barrier-free way to enforce consumer claim rights.

In this case, the automatic execution of the smart contract (here the transfer of the compensation) prevents dispute from arising. Disputes are prevented before they can arise and this is in principle a 'smart way' of dispute resolution. However, there is an elephant in the room and that is that economically the airlines have no reason to use smart contracts, which provide automatic compensation on a large scale. One solution to this problem is to make the use of smart contracts mandatory for certain areas of law, such as here, by the legislature.

In this case, the legislature ultimately provides mandatory smart dispute resolution through the automatic execution of the smart contracts. In principle, the consumer does not need to know anything about the smart contract, as it operates in the background. Of course, the consumer should be informed when booking the flight online and give his consent that possible compensation amounts are transferred to his bank account or wallet. That this is not just a pie in the sky shows the latest development in Germany, where there are plans for mandatory automatic compensation in the event of flight delays or cancellations.⁸⁰

⁸⁰ BR-Drucksache 571/18(B) <[https://www.bundesrat.de/SharedDocs/drucksachen/2018/0501-0600/571-18\(B\).pdf](https://www.bundesrat.de/SharedDocs/drucksachen/2018/0501-0600/571-18(B).pdf)> accessed 9 July 2021; <[sessionid=848B3223C9D-F9A39CE982D81A43CB2FB.1_cid349?__blob=publicationFile&v=1](https://www.bundesrat.de/SharedDocs/drucksachen/2018/0501-0600/571-18(B).pdf?__blob=publicationFile&v=1)> accessed 9 July 2021. See also Martin Fries, 'Automatische Vertragsentschädigung: Smart contracts für Verbraucher' (*Blog zur Verbraucherstreitbeilegung*, 3 January 2019) <<https://www.verbraucherstreitbeilegung.de/automatische-vertragsentschaedigung-smart-contracts/>> accessed 9 July 2021.

(b) *Forum Selection Clause in a Smart Contract for ODR Procedure*
(*Smart Dispute Resolution in a Strict Sense*)

It is obvious that not all disputes can already be solved or avoided in the manner just described by the use of (mandatory) smart contracts. Let us therefore turn to the second level of dispute resolution, namely the use of forum selection clauses in a smart contract for an ODR procedure in the event of a dispute arising through the use of a smart contract itself (smart dispute resolution in a strict sense). A conceivable situation, in the case of the previous example, would be that the program that records flight delays and cancellations online (the oracle) transmits incorrect times to the smart contract, for example four hours of delay, although the flight is not delayed at all.

The smart contract will then proceed to automatic execution (ie, with transferring the compensation to the passengers) even though there is no legal basis for this. The incorrect transfer of the compensation to the passenger could also happen due to a defect in the software. For example, due to a programming error, flight times are matched that do not belong to the booked flight. In such cases, due to the lack of revocability of the transactions in the blockchain-based smart contract, the only thing left for the aggrieved party (here the airline) is a claim for refund.⁸¹

Clearly, all the benefits of smart contracts are then lost, as the automated, digital world is left behind and normally the aggrieved party must analogously demand in state court that a transaction be executed again in the opposite direction (reversed transaction).⁸² This example reflects a fundamental problem, namely ‘that the power of technology to resolve disputes is outweighed by the power of technology to generate disputes.’⁸³ For example, studies have shown that 100 errors can be hidden in 1,000 lines of code and a smart contract is nothing more than programmed computer code.⁸⁴

However, there is also a solution to this scenario where the contractual relationship *and* dispute resolution remain in the digital world. In order to avoid a dispute over the performance of a smart contract - for example, over the erroneous execution - being brought before a state court, the parties to the smart

⁸¹ Markus Kaulartz, ‘Smart Contract Dispute Resolution’ in Matthias Fries and others (eds), *Smart Contracts* (Mohr Siebeck 2019) 74.

⁸² *ibid.*

⁸³ Referring to this finding according to *Kash and Rabinovich-Einy*: Amy Schmitz and Colin Rule, ‘Online Dispute Resolution for Smart Contracts’ (2019) 2 *Journal of Dispute Resolution* 104.

⁸⁴ See Amy Schmitz and Colin Rule, ‘Online Dispute Resolution for Smart Contracts’ (2019) 2 *Journal of Dispute Resolution* 104.

contract could themselves agree to a private dispute resolution mechanism.⁸⁵ The most effective option in this regard would be to include in the smart contract a forum selection clause in favor of an ODR procedure (preferably with a choice of law).⁸⁶

An ODR forum selection clause in a smart contract could have the following content: ‘Any dispute controversy, difference or claim arising out of or relating to the contract, performance, breach or termination thereof will be settled by name of the ODR system/provider’.⁸⁷ The question of whether and when such an ODR forum selection clause is permissible in a smart contract depends on many circumstances and ultimately on the applicable domestic law,⁸⁸ but unfortunately must be left aside here.

So how is it possible to include a forum selection clause in the smart contract and to initiate ODR proceeding Smart contracts can be controlled when they are connected to an online interface, allowing the parties to control and monitor the contract itself and its execution? Should the aggrieved party have a need for dispute resolution through an ODR procedure, this online interface could include, for example, a control panel on which the parties could click (eg Start ODR procedure). A concrete example of the smart integration of these capabilities into the smart contract offers *Sagewise*, a Los Angeles-based startup.⁸⁹

Sagewise’s technology is integrated into a smart contract via a coded clause in which users pre-select certain parameters, such as when and how long to delay the execution of the smart contract and who will settle any disputes.⁹⁰ For example, this clause allows a party to freeze execution of the contract and activate *Sagewise*’s ‘Dispute Resolution Mode’ if a dispute arises.⁹¹ The dispute is then forwarded to an external ODR process. The mass use of this technology would have essential benefits. For example, if the aggrieved party is a consumer, the problem of rational apathy is clearly reduced because, in principle, only a click is required to initiate the dispute resolution mechanism. This digital symbiosis of (smart) agreement and dispute resolution could

⁸⁵ Markus Kaulartz, ‘Smart Contract Dispute Resolution’ in Matthias Fries and others (eds), *Smart Contracts* (Mohr Siebeck 2019) 74.

⁸⁶ Amy Schmitz and Colin Rule, ‘Online Dispute Resolution for Smart Contracts’ (2019) 2 *Journal of Dispute Resolution* 105.

⁸⁷ This is a (changed) example from JUR AG. See above: <<https://jur.io/>> accessed 9 July 2021.

⁸⁸ On these aspects, see Markus Kaulartz, ‘Smart Contract Dispute Resolution’ in Matthias Fries and others (eds), *Smart Contracts* (Mohr Siebeck 2019) 74.

⁸⁹ For information on the company, see: <<https://www.zoominfo.com/c/sagewise/452927953>> accessed 9 July 2021.

⁹⁰ Amy Schmitz and Colin Rule, ‘Online Dispute Resolution for Smart Contracts’ (2019) 2 *Journal of Dispute Resolution* 116.

⁹¹ *ibid.*

be a weapon against rational apathy in small claims and would also promote user-friendliness for litigants.

C. Conceivable Application Areas of Smart Dispute Resolution Procedures

Although already been pointed out, for the sake of clarity the conceivable scope of mechanisms for smart dispute resolution procedures will be summarized once more. First of all, it should be recalled that, by definition, these are contractual relations, where the characteristic contractual terms and performance are digitally verifiable and controllable.⁹² Otherwise, no automated and self-executing smart contract can be used to digitally replicate at least the contractual level of the legal relationship. The previously mentioned example of the car insurance contract is a good one.

A new Tesla that is connected to the Internet and can transmit its position and mileage via GPS is suitable to be connected to a smart contract. A fully mechanically functioning classic vintage car cannot be connected to a smart contract without special technical modifications. Moreover, contracts with small underlying values seem particularly well suited for the use of smart dispute resolution. There are several reasons for this. On the one hand, the problem of rational apathy is solved more consistently in these situations, since the aggrieved parties usually avoid going to court for claims up to several hundred euros.⁹³

This creates the possibility of dispute resolution where it often did not exist *de facto* before the use of digital solutions in legal reality. There is also a psychological effect. When financial stakes are high, many people tend to leave the assessment of disputes to other people rather than technology. In principle, this does not speak against smart dispute resolution because ODR procedures also exist where human beings adjudicate the dispute, but the limit of automation (eg, ODR dispute resolution solely and finally by algorithms) has been reached where empathy, knowledge of human nature and empathy are of great importance.⁹⁴

Furthermore, some essential advantages of state court litigation over private forms of dispute resolution such as ODR should be noted. For example, state proceedings are backed with several constitutionally guaranteed procedural rights that do not apply to private forms of dispute resolution (eg, art

⁹² Markus Kaulartz and Jörg Heckmann, 'Smart Contracts - Anwendung der Blockchain-Technologie' (2016) *Computer und Recht* 618-19.

⁹³ Jürgen Keßler, 'Verbraucherschutz Reloaded - Auf dem Weg zu einer deutschen Kollektivklage?' (2016) *Zeitschrift für Rechtspolitik* 3.

⁹⁴ Susanne Hähnchen and others, 'Legal Tech' (2020) *Juristische Schulung* 626, 630.

6 of the ECHR). Finally, technical feasibility is an important consideration. From a legal perspective, it can be said that the more complex a legal relationship is, the greater the technical challenge to reproduce or cover it digitally. Technically speaking, the complexity and technical maturity of the blockchain and contractware determine how detailed a contractual relationship can be digitally reproduced and which contract parameters are controlled or covered by the smart contract.⁹⁵

In summary, although the proposed mechanisms of smart dispute resolution create new and interesting forms of dispute resolution for legal practice, they can currently only be applied to a limited number of cases. These are mainly small claims of a few hundred euros, whose contractual parameters can be digitally verified. Also, worth considering is the idea of making smart contracts mandatory for certain legal problems by the legislator and thus ensuring smart dispute resolution (in a broad sense) through automatic implementation of smart contracts.

IV. CONCLUSION AND FUTURE OUTLOOK

The use of the latest digital infrastructure and, in particular, smart contracts and ODR procedures have the potential to play an important role for dispute resolution in private law. If both technical phenomena work well together in the context of smart dispute resolution, it seems likely that certain disputes could be handled in a more effective, user-friendly and cost-efficient manner. At the outset, the question was raised whether this digital alternative to state court proceedings is or may yet become the Swiss army knife of dispute resolution of the future? However, as the description of the limited scope and natural limits of smart dispute resolution has shown, this question must be answered in the negative at this time.

It should, however, be seen as positive that the conceivable scope of smart dispute resolution primarily offers a new alternative of dispute resolution for those cases in which the criticism of the state judiciary is particularly strong. Namely, especially for small claims, where rational apathy often thwarts litigations. Therefore, smart dispute resolution could contribute to improving access to justice. However, looking to the future, the scope of these dispute resolution mechanisms could be expanded, so the current assessment is only a snapshot. This is due to the mechanisms' dependence on the technical advances of blockchain and the digitalization of society.

⁹⁵ Eliza Mik, 'Smart Contracts: A Requiem' (2019) *Journal of Contract Law* 2; Klaus Eschenbruch and Robert Gerstberger, 'Smart Contracts' (2018) *Neue Zeitschrift für Baurecht und Vergaberecht* 3.

In the future, it may be possible to digitally monitor more conditions through a smart contract where this is not possible today. Returning to the introductory quote by *Coco Chanel*,⁹⁶ it can thus be summarized that smart dispute resolution will accompany the world of dispute resolution for a long time to come.

⁹⁶ Marcel Haedrich, *Coco Chanel Secrète* (Robert Laffont 1971) 308; in English language: *In order to be irreplaceable, one must always be different.*