

# SMART CONTRACTS & BLOCKCHAIN: THE PANACEA TO THE UNEQUAL BARGAINING POWER OF CONSUMERS?

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**Abstract:** *The growing use of technology, apps, and internet-of-things is pushing innocent consumers to the bottom of the chain when it comes to freely negotiated contracts. Consumers click 'I Agree' without knowing the terms and conditions of the contract. However, this rise in technology may hold the cure to the unequal bargaining power in standard form consumer contracts. This paper highlights the current issues existing in consumer law jurisprudence and explains Blockchain or Decentralised Ledger Technology, and Smart Contracts.*

*The paper argues that the application of such technologies, especially Ricardian Contracts, has the potential to level the playing field and provide equal bargaining power to consumers, without comprising their privacy. It surveys the current use of such technology in areas of insurance, flight compensation and service contracts and demonstrates how issues of consent, legal certainty and enforcement of consumer rights can be better addressed by Blockchain and Smart Contracts.*

*The paper argues that such technologies foster trust, confidentiality, and efficiency and remove jurisdictional barriers in international trade and commerce. However, before such technologies can be given legal sanction for in the area of consumer law, many legal thresholds and statutory requirements will have to be revamped by legislatures. It concludes that Blockchain and Smart Contracts can*

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*help in creating freely negotiated consumer contracts if consumer rights receive support from policymakers.*

**Keywords:** Bitcoin, Blockchain, Decentralized Ledger Technology, Smart Contracts, IoT, Privacy, Ricardian Contract, etc.

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## I. INTRODUCTION

It is no secret that technologies have permeated the lives of humans more than ever before. Every cynic of the 90's who had called the internet a 'fad'<sup>1</sup> is now hooked on to it, either by choice or by necessity. Trade and commerce have quadrupled their potential, and cross border transactions are increasing by the day. Caught in between this rocket science is the innocent consumer clicking 'I agree' on contracts running into mini novels or downloading apps on the Smartphone and signing up for apps that do much more than their described purpose. In a certain sense, technology has made the otherwise powerless consumer even more powerless.

Adding to this helplessness is the new trend, the Internet of Things (hereinafter 'IoT').<sup>2</sup> Devices are connected to each other, interdependent, and connected to the consumer through an app or a URL. Buying an IoT gadget means signing up for an entire system of things.<sup>3</sup> For example, Tesla announced that

<sup>1</sup> David Williams, 'That Internet Thing? It's Just a Fad' (*NBR. Co. Nz*, 31 January 2013) <[www.nbr.co.nz/article/internet-thing-its-just-fad-ns-135266](http://www.nbr.co.nz/article/internet-thing-its-just-fad-ns-135266)> accessed 5 April 2020.

<sup>2</sup> Liz Coll and Robin Simpson, 'Connection and Protection in the Digital Age: The Internet of Things and Challenges for Consumer Protection' (2016) Consumers International <<https://www.consumersinternational.org/media/1292/connection-and-protection-the-internet-of-things-and-challenges-for-consumer-protection.pdf>> accessed 2 April 2020.

<sup>3</sup> The language of this Article is sufficiently broad to cover also cases of so-called automated contracting, i.e. where the parties agree to use a system capable of setting in motion self-executing electronic actions leading to the conclusion of a contract without the intervention of a natural person, *See*, UNIDROIT Principles of International Commercial Contracts 2016, art 2.1.1 (3).

its cars would be able to order spare parts on its own.<sup>4</sup> IBM and Samsung created a smart washing machine that can trigger service calls, etc.<sup>5</sup> The consumer is being pushed further and further down to the bottom of the ladder in terms of freely negotiated contracts, actual consent, and bargaining power. Based on this, technology may sound like the death knell for consumers and a mammoth task for consumer law.

However, this poison pill of technology may well be the vaccine to consumer rights and bargaining power. Mass consumer contracts which are simple, standardised and based on simple facts are executed millions of times every day.<sup>6</sup> The advent of Blockchain or decentralised ledger technology (hereinafter ‘DLT’ or ‘Blockchain’) may serve as the knight in shining armour for consumer protection and regulation of consumer contracts.

Coupled with this is the use of smart contracts, ie, automated contracts prepared in computer code that execute themselves based on pre-defined conditions (hereinafter ‘Smart Contracts’). For a quick reference point, smart contracts have been around for a long time. A vending machine dispensing a can of coca-cola after payment of money is a typical example of Smart Contracts.<sup>7</sup> However, the machine cannot consider if the purchaser is being forced to put the money in the machine, (ie, there is coercion).<sup>8</sup>

On the other hand, DLT, which is the technology used in crypto currencies or what is commonly referred to as ‘Bitcoins’, is a transparent system that prevents asymmetry of information. Smart Contracts have created a buzz only because of blockchain technology,<sup>9</sup> primarily Bitcoins,<sup>10</sup> where the user has

<sup>4</sup> Fred Lambert, ‘Tesla Vehicles can now Diagnose Themselves and Even Pre-Order Parts for Service’ (*Electrek*, 6 May 2019) <<https://electrek.co/2019/05/06/tesla-diagnose-pre-order-parts-service/>> accessed on 5 April 2020.

<sup>5</sup> Amitranjan Gantain, Joy Patra and Ayan Mukherjee, ‘Integrate Device Data with Smart Contracts in IBM Blockchain’ (*IBM Developer*, 1 June 2017) <<https://developer.ibm.com/articles/cl-blockchain-for-cognitive-iot-apps-trs/>> accessed on 5 April 2020.

<sup>6</sup> Miklos Boronkay and Philip Exenberger, ‘Blockchain, Smart Contracts and Arbitration Overrated Hype or Chance for the Arbitration Community?’ in Christian Klausseger and others (eds), *Chapter IV: Science and Arbitration in Austrian Yearbook on International Arbitration 2020* (MANZ Verlag Wien, Stampfli, C.H. Beck 2020) 413.

<sup>7</sup> Nick Szabo, ‘Formalizing and Securing Relationships on Public Networks’ (1997) 2 *First Monday* <<https://firstmonday.org/ojs/index.php/fm/article/view/548>> accessed 7 April 2020.

<sup>8</sup> Mateja Durovic and Andre Janssen, ‘The Formation of Smart Contracts and Beyond: Shaking the Fundamentals of Contract Law?’ (2018) *Research Gate* <[https://www.researchgate.net/publication/327732779\\_The\\_Formation\\_of\\_Smart\\_Contracts\\_and\\_Beyond\\_Shaking\\_the\\_Fundamentals\\_of\\_Contract\\_Law](https://www.researchgate.net/publication/327732779_The_Formation_of_Smart_Contracts_and_Beyond_Shaking_the_Fundamentals_of_Contract_Law)> accessed 2 April 2020.

<sup>9</sup> *Ibid.*

<sup>10</sup> It should be noted that Bitcoins led to the establishment of *Ethereum* which is a more sophisticated blockchain platform allowing more complicated transactions beyond just transfers

access to the entire ledger, and hence, in a certain sense, the consumer is actually ‘the king’.<sup>11</sup> DLT does away with problems of trust, privacy concerns, and most importantly, intermediaries.<sup>12</sup>

There is an exact record of the goods from the manufacturing, to delivery to the end consumer, including its current working status.<sup>13</sup> More importantly, the record is accessible by everyone, including the consumer.<sup>14</sup> Therefore, claims of manufacturing defect, etc. might be easier to make and much easier to prove. Alternatively, the DLT may trigger an error, the moment a non-conforming good is produced. Therefore, DLT holds the potential for increasing efficiency at every level of the supply chain and legal rights, including the elimination of counterfeits.

Further, these technologies can be combined and deployed in favour of consumers. Think of compensation for a delayed flight.<sup>15</sup> No human intervention is required; the contract requires no legal interpretation and enforcement can be instantaneous. The moment the website of the airline is updated with the information of flight delay; compensation can be transferred to the consumer, either in Bitcoins, or to their bank accounts linked through a payment app like GooglePay. *Smart, isn't it?* Such a concept has already been implemented by the insurance giant AXA.<sup>16</sup> Additionally, Blockchain may be used for identity credentials, voter records, permissions, security transactions, property/land use records, interbank settlement records, firmware updates,<sup>17</sup> and cloud storage in the future.<sup>18</sup>

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of currency, or bitcoins. See, L.H. Scholz, ‘Algorithmic Contracts’ (2017) 20 Stanford Technology Law Review 101, 120; TFE Tjong Tjin Tai, ‘Smart contracts En Het Recht’ (2017) 93 Nederlands Juristenblad 176, 177; Ethereum even developed its own coding language called Solidity <<https://solidity.readthedocs.io/en/develop/>> accessed 2 April 2020.

<sup>11</sup> Vijay Raghunathan, ‘Smart Contracts - Putting the Customer Back into “Customer Service”’ (*Medium*, 19 October 2018) <<https://medium.com/@vijay/smart-contracts-putting-the-customer-back-into-customer-service-c2670234e916>> accessed 7 April 2020.

<sup>12</sup> Clifford Chance, ‘Smart Contracts: Legal Agreements for the Digital Age’ (2018) Briefings Clifford Chance <<https://www.cliffordchance.com/content/dam/cliffordchance/briefings/2019/12/smart-contracts-april-2018.pdf>> accessed 4 April 2020.

<sup>13</sup> Boronkay and Exenberger (n 6) 413.

<sup>14</sup> *Ibid.*

<sup>15</sup> C Buchleitner and T Rabl, ‘Blockchain und Smart Contracts’ (2017) *Ecolex* 4, 7.

<sup>16</sup> Zibin Zheng and others, ‘An Overview on Smart Contracts: Challenges, Advances and Platforms’ (2020) 105 *Future Generation Computer Systems* 475, 486.

<sup>17</sup> K Christidis and M Devetsikiotis, ‘Blockchains and Smart Contracts for the Internet of Things’ (2016) 4 *IEEE Access* 2292.

<sup>18</sup> Da’Morus Cohen and Anthony DiResta, ‘Bitcoin, Blockchain and Consumer Protection Laws’ (*Holland & Knight*, 10 January 2018) <<https://www.jdsupra.com/legalnews/bitcoin-blockchain-and-consumer-20912/>> accessed on 5 April 2020.

However, smart contracts and Blockchain still have many legal hurdles to cross. The first one is that of a legal regime supporting such contracts. *Does a legal system recognise consent through electronic means, digital signatures, app-based consent?* Second, *who drafts the contracts, and how?* Consumers are unequipped to create coded contracts. *So do we again permit companies and commercial entities to draft lop-sided smart contracts, and that too self-executing?*<sup>19</sup> *Can such contracts be tested, read, or modified? Can one party unilaterally modify such contracts? How does a consumer file a dispute? How do government bodies regulate such contracts?*

It has been argued, although surprisingly, that consumer law does not apply to Smart Contracts.<sup>20</sup> However, this paper argues otherwise,<sup>21</sup> and analyses these questions in the context of consumer law and attempts to find potential solutions, if not the right answer. It must be clarified at the outset, though, that without suitable amendments to contract law statutes and support from courts, this dream empowering consumers through smart contracts and Blockchain will only remain a dream. Therefore, the scope of this paper is confined to analysing consumer rights and how the same can be strengthened through technology. Issues of contract law, the validity of such contracts, etc. have not been addressed.

**Part I** of the paper describes the current issues in consumer protection law and technology. **Part II** of the paper explains the different technologies that can be used in fostering consumer rights. **Part III** of the paper will attempt to address those issues through the application of smart contracts and Blockchain. **Part IV** of the paper highlights the legal issues that will have to be addressed by countries to implement these technologies. Lastly, the paper concludes that smart contracts and Blockchain can address issues of privacy, enforcement, standard-form contracts, unequal bargaining power, and provide a fillip

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<sup>19</sup> For the reasons *see* Tjong Tjin Tai, 'Smart Contracts En Het Recht' (n 10) 182; For different views, *see*: Alexander Savelyev, 'Contract Law 2.0: "Smart Contracts" as the Beginning of the End of Classic Contract Law' (2017) 26 Information and Communications Technology Law 116, 120. According to him, the main field of applicability of smart contract are the business to business and consumer to consumer transactions. The exact impact of development of smart contracts on consumer law and policy is of course yet uncertain. It should also be pointed out that because to draft and enter smart contracts have high initial costs and require infrastructure and expert knowledge (coding) the access to it is not equal. Only those who can afford the powerful hardware and know how to computer-code or can afford to hire a programmer can (as of now) utilise the technology, though certain startups exist to allow 'laymen' to draft their own smart contracts.

<sup>20</sup> Savelyev (n 19) 120.

<sup>21</sup> Pete Rizzo, 'Consumers' Research: Blockchain Tech Will Boost Consumer Protection' (*Coindesk*, 8 August 2015) <[www.coindesk.com/consumers-research-blockchain-tech-will-boost-consumer-protection](http://www.coindesk.com/consumers-research-blockchain-tech-will-boost-consumer-protection)> accessed on 5 April 2020.

to international trade and commerce across jurisdictions. Most importantly, the use of smart contracts and Blockchain may be the answer to the perennial problem of the unequal bargaining power of consumers.

## II. PART I: CURRENT ISSUES IN THE USE OF TECHNOLOGY & CONSUMER LAW

Consumer laws across jurisdictions have struggled to keep with the frequent changes in technology. With new inventions, creative modifications, and the digitisation movement, consumer rights have not received sufficient attention.

Currently, a typical consumer contract executed over the internet works in the following manner. A consumer logs on to a website, or opens an app on the Smartphone. He/She then completes a user registration form providing his/her email address, or phone number. A standard form contract running into pages and pages is displayed, or hyperlink is provided next to the checkbox, 'I understand the terms and conditions and agree to the same'. Consent is provided to these pre-defined terms and conditions by clicking the 'I agree' button, or ticking the checkbox.

For registrations through phone numbers, a One-Time-Password ('OTP') is generated and entered by the consumer. The consumer then proceeds to shop and makes payment through his/her credit card, debit card, a payment app, or internet banking. Subsequently, goods are delivered to him/her.

If this transaction is broken down for a moment:

- (a) Consent: The consumer has consented to terms and conditions about which he/she has no idea. Popularly known as 'shrink-wrap' contracts, or 'click-wrap' contracts, the consumer has no choice but to agree.<sup>22</sup> In such cases, traditional jurisprudence from across countries suggests that the courts are likely to uphold such contracts,<sup>23</sup> unless enforcement would be unreasonable under the circumstances, or the contract is prima facie unconscionable.<sup>24</sup> The act of signing up and providing an

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<sup>22</sup> Nathan J Davis, 'Presumed Assent: The Judicial Acceptance of Clickwrap' (2007) 22 Berkeley Technology Law Journal 577.

<sup>23</sup> *Thornton v Shoe Lane Parking Ltd.* (1971) 2 QB 163 (Lord Denning MR); *R (Software Solutions Partners Ltd) v H.M. Customs & Excise* (2007) EWHC 971 [67]; UNIDROIT Principles of International Commercial Contracts 2016, art 2.1.19.

<sup>24</sup> William J Jr Condon, 'Electronic Assent to Online Contracts: Do Courts Consistently Enforce Clickwrap Agreements' (2003) 16 Regent University Law Review 433.

OTP is considered to be sufficient consent.<sup>25</sup> Even the vending machine is an example of a ‘wrapper contract’ made unilaterally by the owner of the machine.<sup>26</sup>

- (b) Unequal Bargain: Tied to the idea of consent is the unequal bargaining power of the consumer. Not only does the consumer have no idea of what he/she has agreed upon, but he/she also has no option to change the terms and conditions.<sup>27</sup> He/She cannot make a fair bargain,<sup>28</sup> cannot alter the terms of warranties, etc.
- (c) Privacy: In agreeing to pre-defined terms, the consumer, without knowing, has surrendered his/her privacy. The seller now has access to his/her contacts, location, browsing history, sometimes even photographs.<sup>29</sup>
- (d) Confidentiality: While making payment for the goods, the consumer has provided his/her card details, bank account details, etc., and has risked phishing of the information.<sup>30</sup>
- (e) Trust: Despite having compromised so much, the consumer still does not trust that the goods will be delivered in time, that they will conform to what was demonstrated online, that they would be free from defects. This deficit of trust is only compounded in international transactions.<sup>31</sup> *Moreover, how will disputes be resolved? Will the seller refund the money? Alternatively, replace the product?*

The questions consumer law regulators have struggled with, therefore is *can the same transaction be done without the consumer comprising his/her rights, privacy, confidentiality, and instead build more trust?* This is where smart contracts and Blockchain may have the answer.

<sup>25</sup> Trilegal, ‘Electronic Signatures in India’(Adobe, September 2017) <<https://acrobat.adobe.com/content/dam/doc-cloud/en/pdfs/electronic-signatures-in-india-uk.pdf>> accessed 8 April 2020.

<sup>26</sup> Durovic and Janssen (n 8) 12.

<sup>27</sup> Marcos Loos and Joasia Luzak, ‘Wanted: A Bigger Stick. On Unfair Terms in Consumer Contracts with Online Service Providers’ (2016) 39 Journal of Consumer Policy 63.

<sup>28</sup> *Ibid* 67.

<sup>29</sup> Miriam J Metzger, ‘Privacy, Trust, and Disclosure: Exploring Barriers to Electronic Commerce’ (2004) 9 Journal of Computer Mediated Communication.

<sup>30</sup> Gregory Megaw, ‘Phishing Within E-Commerce: Reducing the Risk, Increasing the Trust’ (2010) <<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.460.2623&rep=rep1&type=pdf>> accessed 14 April 2020.

<sup>31</sup> Metzger (n 29) 4.

### III. PART II: UNDERSTANDING SMART CONTRACTS AND BLOCKCHAIN

There has been great euphoria around Bitcoins and crypto currency across the world.<sup>32</sup> While many regimes have made all efforts to ban them, some jurisdictions have welcomed the technology with open arms.<sup>33</sup> In some jurisdictions, like India, the government had completely banned them,<sup>34</sup> but the judiciary has set it aside.<sup>35</sup> Technology lovers have painted a beautiful future of artificial intelligence and crypto currency.<sup>36</sup> For the common man, Blockchain means Bitcoins. However, that is only the tip of the iceberg. The potential of DLT to a consumer is tremendous, and it may even reverse the long-held tradition of unequal bargaining power against the consumers.

However, it is vital to first understand these technologies, by governments and consumers, in order to prevent prejudice against their use and implementation:

- (a) Smart Contracts: The term was coined before 1990 by their creator, Szabo,<sup>37</sup> and only meant contracts that could be executed by the computer protocols.<sup>38</sup> In the words of Szabo, Smart Contracts are ‘computerised transaction protocol that executes the terms of a contract. The general objectives of smart contract design are to satisfy common contractual conditions (such as: payment terms, liens, confidentiality, and enforcement etc.), minimise exceptions both malicious and accidental, and minimise the need for trusted intermediaries like banks or other kind of agents’.<sup>39</sup> To put it simply, a computer code that is created to automatically execute contractual duties upon the occurrence of

<sup>32</sup> See, Global Legal Research Centre, ‘Regulation of Cryptocurrencies around the World’ (2018) The Law Library of Congress <<https://www.loc.gov/law/help/cryptocurrency/cryptocurrency-world-survey.pdf>> accessed 12 April 2020.

<sup>33</sup> For example, Japan, United States of America, Germany, Netherlands, United Kingdom, New Zealand etc. See, *Ibid.*

<sup>34</sup> Reserve Bank of India, ‘Prohibition on Dealing in Virtual Currencies (VCs)’ Circular Bearing Number DBR.No.BP.BC.104/08.13.102/2017-18 <<https://rbidocs.rbi.org.in/rdocs/notification/PDFs/NOTI15465B741A10B0E45E896C62A9C83AB938F.PDF>> accessed on 12 April 2020.

<sup>35</sup> *Internet and Mobile Assn. of India v RBI*, (2020) SCC OnLine SC 275.

<sup>36</sup> Ahmed Banafa, ‘Blockchain and AI: A Perfect Match?’ (*BBVA Open Mind*, 6 May 2019) <<https://www.bbvaopenmind.com/en/technology/artificial-intelligence/blockchain-and-ai-a-perfect-match/>> accessed on 9 April 2020.

<sup>37</sup> Nick Szabo, ‘Smart Contracts’ (1994) <<http://www.fon.hum.uva.nl/rob/Courses/InformationInSpeech/CDROM/Literature/LOTwinterschool2006/szabo.best.vwh.net/smart.contracts.html>> accessed 7 April 2020.

<sup>38</sup> Nick Szabo (n 37).

<sup>39</sup> Nick Szabo (n 37).

a trigger event,<sup>40</sup> or agreements wherein execution is automated, usually by a computer programme.<sup>41</sup>

It should be noted that there is nothing ‘smart’ about ‘smart contracts.’ They are not even contracts in the real sense, and their binding nature has been questioned.<sup>42</sup> There are considered to be a disruptive legal innovation which may make traditional jurisprudence on the formation of contract redundant.<sup>43</sup> Hence, ‘smart contracts’ is a misnomer<sup>44</sup> as Smart Contracts do not contain any obligations,<sup>45</sup> and there is no consideration.<sup>46</sup> Smart Contracts are essentially embedded contracts in all sorts of property that is valuable and controlled by digital means.<sup>47</sup>

Thus, once parties agree on a smart contract, the execution of the contract is not under the control of the parties.<sup>48</sup> The discretion in performance and enforcement is deemed to have been exercised.<sup>49</sup> However, when Smart Contracts are used along with Blockchain or DLT, they are not only executed ‘smart’ but are also concluded ‘smart’ through the Blockchain.<sup>50</sup> Thus, the algorithms work something similar to an ‘artificial agent’ in the context of the formation of a contract.<sup>51</sup>

Today, examples of such protocols are everywhere, auto-debit for credit card payments, subscriptions to stream services, such as Netflix, agreement to deliver goods through Amazon, etc. All of the e-commerce industry today would fall within the traditional notion of Smart Contracts. However, the reference to Smart Contracts here means the

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<sup>40</sup> P. Paech, ‘The Governance of Blockchain Financial Networks’ (2017) 80 *Modern Law Review* 1072, 1082.

<sup>41</sup> Max Raskin, ‘The Law and Legality of Smart Contracts’ (2017) 1 *Georgetown Technology Review* 305, 306; T Söbbing, ‘Smart Contracts und Blockchain: Definitionen, Arbeitsweise, Rechtsfragen’ (2018) *IT-Rechts-Berater* 43, 44.

<sup>42</sup> S Bourque and S Fung Ling Tsui, *A Lawyer’s Introduction to Smart Contracts* (Scientia Nobilitat, 2014) 4; Reggie O’Shields, ‘Smart Contracts: Legal Agreements for the Blockchain’ (2017) 21 *North Carolina Banking Institute* 178.

<sup>43</sup> Durovic and Janssen (n 8) 19.

<sup>44</sup> Buchleitner and Rabl (n 15) 6; Söbbing (n 41) 46; Durovic and Janssen (n 8) 19.

<sup>45</sup> Savelyev (n 19) 132.

<sup>46</sup> Kevin Werbach and Nicolas Cornell, ‘Contracts Ex Machina’ (2017) 67 *Duke Law Journal* 314.

<sup>47</sup> N Szabo (n 7)

<sup>48</sup> Stuart D Levi and Alex B Lipton, ‘An Introduction to Smart Contracts and their Potential and Inherent Limitations’ (2018) *Harvard Law School Forum on Corporate Governance* <<https://corpgov.law.harvard.edu/2018/05/26/an-introduction-to-smart-contracts-and-their-potential-and-inherent-limitations/>> accessed on 5 April 2020.

<sup>49</sup> Paech (n 40) 1077.

<sup>50</sup> Buchleitner and Rabl (n 15) 7.

<sup>51</sup> Scholz (n 10) 108.

use of computer code, with ‘if-then’ scenarios that require no human intervention, (ie, transacting parties leave the performance of the contract to the software). For example, if goods are not delivered by a scheduled date, a penalty of 10% of the contract price shall automatically be debited from the account of the seller and paid to the buyer.

The tricky area, however, is how will a computer code receive the input that goods have not been delivered since the real world exists outside the computer code. This input can be given to the computer code in two ways, (a) through an Oracle, ie, a website which will contain that input, like the tracking of a courier, or consignment bill; or (b) through the use of Blockchain or DLT which will automatically upload the ledgers as soon as delivery is made. It is pertinent to point out that Smart Contracts can work without Blockchain, something that is commonly not understood.<sup>52</sup>

- (b) Blockchain or DLT: A distributed ledger is a decentralised, peer validated crypto-ledger, consisting of a network of nodes that provides a permanent chronological record of all prior changes.<sup>53</sup> Think of a public register in which everyone can access, and everyone can make an entry. However, once the entry is made, it cannot be changed without the consent of every single person. Therefore, there is no information asymmetry, no chances of fraud, no data being corrupted or manipulated, and there is no intervening party who controls the register. This, in essence, is Blockchain or DLT.

An excellent example of the use of this technology is the logistics business. Every shipment is connected to sensors and updates the entire record of delivery. The moment the goods are shipped, in transit, delivered, etc., each user on the Blockchain has access to that information.<sup>54</sup>

- (i) *Permissioned Blockchain*: A permissioned Blockchain is where only a certain group of people with a ‘key’ can make changes.
- (ii) *Permission less Blockchain*: A permission less Blockchain is where anyone can make changes, subject to the approval of all others.

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<sup>52</sup> Durovic and Janssen (n 8) 6.

<sup>53</sup> Sloane Brakeville and Bhargav Perepa, ‘Blockchain Basics: Introduction to Distributed Ledgers’ (*IBM Developer*, 18 March 2018) <<https://developer.ibm.com/technologies/blockchain/tutorials/cl-blockchain-basics-intro-bluemix-trs/>> accessed on 5 April 2020.

<sup>54</sup> Zheng (n 16) 476.

- (c) Oracle: Blockchain or DLT is not connected to the internet.<sup>55</sup> Hence, it needs an Oracle, i.e. Oracles are trusted data feeds that interface smart contracts with the external world, thus allowing a smart contract to be more flexible (adjustable between coded parameters).<sup>56</sup> To go back to the airline example, if a flight is delayed or cancelled, the website of the airline will be updated with the information. The Oracle would extract the data from the website and feed it to the Smart Contract. Even currently, streaming services get suspended if monthly payments are not made. Without realising, consumers are already surrounded by Oracles and Smart Contracts. There are also platforms such as Town Crier<sup>57</sup> which scrape data from reliable websites and feed the data to the smart contracts.

Therefore, an Oracle, as a bridge to the outside world and the world of computer code, will supply this information to the variable in the contract. This will, in turn, trigger the obligation for compensation, etc. The problem, however, is what if the cancellation or delay is due to force majeure event,<sup>58</sup> or there is unreasonable delay.<sup>59</sup> All such cases where an interpretation is required, DLT or Smart Contracts find their application limited.

- (d) Ricardian Contracts: According to its creator, Ian Grigg, a Ricardian Contract is *'a digital contract that defines the terms and conditions of an interaction, between two or more peers, that is cryptographically signed and verified. Importantly it is both human and machine readable and digitally signed'*.<sup>60</sup> To put it simply, a Ricardian Contract is a one that exists both in paper and code form. A person can read the contract

<sup>55</sup> The reason is that for blockchains to function at each node the result of an equation must be the same. If, using our example of a stock price as a variable in an equation, the result at each node would be different, because they would be able to verify the price of the stock in real time, the blockchain would not be able to function.

<sup>56</sup> The trust worthiness of oracles and the related sources of information are crucial for the correct functioning of smart contracts. Since oracles are not part of the distributed ledger, they need to be designed and programmed in such a way to be sufficiently reliable.

<sup>57</sup> F Zhang and others, 'Town Crier: An Authenticated Data Feed for Smart Contracts' (Proceedings of the 2016 ACM SIGSAC Conference on Computer and Communications Security, 2016) 270.

<sup>58</sup> N Guggenheim, 'The Potential of Blockchain for the Conclusion of Contracts' in R Schulze, D Staudenmeyer and S Lohse (eds), *Contracts for the Supply of Digital Content: Regulatory Challenges and Gaps* (Nomos, 2017) 83, 95.

<sup>59</sup> Falco Kreis and Markus Kaulartz, 'Smart Contracts and Dispute Resolution – A Chance to Raise Efficiency?' in Matthias Scherer (ed), *ASA Bulletin* vol 37 (Association Suisse de l'Arbitrage; Kluwer Law International, 2019) 336, 339.

<sup>60</sup> Dmitri Kotoshov, 'Smart vs Ricardian Contracts: What's the Difference?' (*EliNext*, 28 February 2018) <[www.elinext.com/industries/financial/trends/smart-vs-ricardian-contracts/](http://www.elinext.com/industries/financial/trends/smart-vs-ricardian-contracts/)> accessed 5 April 2020.

just like he/she would ordinarily. However, the terms and conditions of the contract are self-executing based on ‘if-then’ conditions, like a Smart Contract. Therefore, a Ricardian Contract is a Smart Contract that exists in code as well as readable text.

It should be noted that not all Smart Contracts are Ricardian Contracts, and not all Ricardian Contracts are Smart Contracts. Smart Contracts are digital agreements which have already been agreed upon. Ricardian Contracts, on the other hand, record ‘intentions’ and ‘actions’ like an ordinary contract, whether it has been executed, or not.<sup>61</sup> There are also reverse engineering tools like E-rays, which convert an encoded contract into readable form.<sup>62</sup> Similarly, new languages such as IELE are now being developed to bridge the gap between machine code and human language.<sup>63</sup>

#### IV. PART III: USE OF SMART CONTRACTS AND BLOCKCHAIN

Anyone reading this paper, may, in fact, be convinced after reading the above, that ‘this is too much tech’. *How an ordinary consumer who does not understand standard form contracts is, be reasonably be expected to understand all these technologies?* That is a fair question. However, as consumers seek more simplicity, transparency and accessibility at a lesser cost,<sup>64</sup> Smart Contracts and Blockchain may just be the solution to these concerns:

- (a) Trust: Since Smart Contracts are self-executing, the problem of enforcement becomes minimal, if not zero. Therefore, there is no need for trust between the consumer and the seller before undertaking the transaction.<sup>65</sup> The trust is digitised through certainty of execution.<sup>66</sup>

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<sup>61</sup> *Ibid.*

<sup>62</sup> Zheng (n 16) 479.

<sup>63</sup> C Lattner and V Adve, ‘LLVM: A Compilation Framework for Lifelong Program Analysis & Transformation’ (Proceedings of the International Symposium on Code Generation and Optimisation: Feedback-Directed and Runtime Optimisation, IEEE Computer Society, 2004) 75; M Coblenz, ‘Obsidian: A Safer Blockchain Programming Language’ (Proceedings of the 39th International Conference on Software Engineering Companion, ICSE-C ’17, 2017) 97.

<sup>64</sup> G Vannieuwenhuysse, ‘Arbitration and New Technologies: Mutual Benefits’ (2018) 35 *Journal of International Arbitration* 119, 120.

<sup>65</sup> This has led some authors to the conviction that only ‘the code is the law’ and that law is obsolete for smart contracts *see* L. Lessig, *Codes and Other Laws of Cyberspace* (Basic Books, 1999) 24. However, this opinion did not gain sufficient support as it is obvious that (contract) law remains to play an important role for smart contracts. *See*, M Kaulartz and J Heckmann, ‘Smart Contracts – Anwendung der Blockchain-Technologie’ (2016) *Computer Und Recht* 618; Tjong Tjin Tai, ‘Smart Contracts En Het Recht’ (n 10) 179.

<sup>66</sup> I-H Hsiao, ‘Smart Contract on the Blockchain-Paradigm Shift for Contract Law’ (2017) 14 *US-China Law Review* 685, 687.

If the consumer receives defective goods, or the shipment is delayed, conditions within the Smart Contract will be triggered, and the consumer will immediately receive refunds, or compensation. Consumers may even communicate directly with the Smart Contract, feeding it data about the delivery.<sup>67</sup> This reduces the chances of malicious behaviours like fraud and also, significantly reduces the turnaround time.<sup>68</sup>

For replacements, the consumer can always be requested to provide input on whether he/she wants a refund, or a replacement through the website, or app (the Oracle). Something like this is currently done by Amazon,<sup>69</sup> or the PayPal Dispute Resolution Process.<sup>70</sup> Therefore, the consumer is assured that his/her money is safe and that he/she has a sufficient remedy in case his/her rights are violated. By virtue of their tamper-proof, time-stamped and immutable character, smart contracts offer a viable option to create and strengthen trade relationships.<sup>71</sup>

- (b) Self-Enforcement: The self-enforcement and lack of non-compliance ensure that warranties are not subject to interpretation, that consumers are not harassed by legal jargon of the burden of proof and procedural rules. This also lowers the overall costs of enforcement and litigation of consumer rights.<sup>72</sup>

There is no verification of rights. If the good purchased, for example, is a watch and the watch has stopped working, the DLT or Blockchain would have recorded that the watch is not working, and hence, the breach of warranty is *ex facie* proved. The only condition remaining to be fulfilled is the replacement of the watch, or the refund of the money. The instant remedy of violation of rights would also limit claims for compensation on account of harassment, mental agony, and unfair trade.<sup>73</sup>

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<sup>67</sup> Tjong Tjin Tai, 'Force Majeure and Excuses in Smart Contracts' (2018) Tilburg Private Law Working Paper No. 10/2018, 4 <[ssrn.com/abstract=3183637](https://ssrn.com/abstract=3183637)> accessed 10 April 2020.

<sup>68</sup> Zheng (n 16) 476.

<sup>69</sup> See <<https://www.amazon.in/gp/help/customer/display.html?nodeId=201819090>> accessed 10 April 2020.

<sup>70</sup> The exact process is explained under the following link: <<https://www.paypal.com/us/brc/article/customer-disputes-claims-chargebacks-bank-reversals>> accessed 10 April 2020.

<sup>71</sup> Oscar Borgogno, 'Usefulness and Dangers of Smart Contracts in Consumer Transactions' in Larry A DiMatteo, Michel Cannarsa and Cristina Poncibò (eds), *The Cambridge Handbook of Smart Contracts, Blockchain Technology and Digital Platforms* (Cambridge University Press 2019) 288.

<sup>72</sup> Hsiao (n 66) 687.

<sup>73</sup> Cohen and DiResta (n 18).

- (c) Legal Certainty: One of the key advantages of Smart Contracts would be the reduction of costs of enforcement, but more important issues of cross border legal frameworks and rules of civil procedure will not arise as Smart Contract is independent of applicable law.<sup>74</sup> Consumer disputes, especially in cross border transactions, would substantially drop<sup>75</sup> as they would be detached, to a certain degree from the constraints of national laws.<sup>76</sup>
- (d) Consent: By legal systems recognising consent through electronic means, and the UNCITRAL Model Law on E-Commerce along with UNIDROIT Principles sanctioning consent to a system of things in the case of IoT,<sup>77</sup> consumers would be more willing to undertake transactions if they can see the terms and conditions and actually consent to them along with the added advantage of self-enforcement. How such consumers will see the code is discussed in Part IV.
- (e) Privacy: Since Blockchain or DLT does not require the identity of the party holding the asset but applies to the asset itself, there is no need for the consumer to provide his/her name, contact details, GPS location, etc. A physical address may be sufficient, without electronic access to his/her private data.<sup>78</sup>
- (f) Confidentiality: Similarly, there is no need for linking bank accounts, or digital payments, or paying commissions. Crypto currency can directly be debited and credited without the need for any financial intermediary.
- (g) Bargaining Power: The most significant advantage of Smart Contracts is that the consumers may be able to negotiate a specific contract.<sup>79</sup>

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<sup>74</sup> C Lim, TJ Saw and C Sargeant, 'Smart Contracts: Bridging the Gap Between Expectation and Reality' (2016) Oxford Business Law Blog <[www.law.ox.ac.uk/business-law-blog/blog/2016/07/smartcontracts-bridging-gap-between-expectation-and-reality](http://www.law.ox.ac.uk/business-law-blog/blog/2016/07/smartcontracts-bridging-gap-between-expectation-and-reality)> accessed 10 April 2020.

<sup>75</sup> Shereen Khan, Olivia Tan Swee Leng and Nasreen Khan, 'Legal Challenges of Consumer Protection in Blockchain Transactions' (33rd IBIMA Conference Proceedings, Granada, 10 April 2019).

<sup>76</sup> Vannieuwenhuysse (n 64) 129.

<sup>77</sup> UNIDROIT Principles of International Commercial Contracts 2016, art 2.1.1; UNCITRAL Model Law on Electronic Commerce 1996, art 11.

<sup>78</sup> Zheng (n 16) 477.

<sup>79</sup> Kaulartz and Heckmann (n 65) 622; *When describing the actual process of formation of on-chain smart contracts, the concept can be well explained through the Ethereum's process. This process is as follows: The user first types out the contract in coding language, which the user has to download the Ethereum software and be part of its network. Then he will 'propose' a specific contract by making it available in the system. The contract will have its own identification number and 'function as an autonomous entity within the system, somewhat similar to how a website may operate on Internet'. Another user may then 'accept the*

This can be achieved through options being given to the consumer through form filling links. Something akin to current consumer purchases online.<sup>80</sup> Such forms with minimal data input from consumers can be supported by statutory representations and warranties and hence, not required in the contract *per se*. This would minimise the size of the contract to the essentials which actually require agreement between the parties.

Moreover, if Ricardian Contracts are used (as opposed to just Smart Contracts), consumers will in effect draft the contracts and companies will then consent to the clauses, along with national statutory protections which will be pre-defined and accessible to both parties.

Since contracts would self-execute if money is debited from the account of the seller and is not refunded, it will be company filing the claim against the consumer and hence, the burden of proof would stand reversed. This may limit, if not end consumer harassment by big corporate with deep pockets to fund endless litigation compelling the innocent consumer to settle with the company out of frustration, lack of funds to continue fighting, especially for small claims.

#### V. PART IV: LEGAL HURDLES & VIABLE OPTIONS

While the scenario above raises hope of a pro-consumer regime, such a regime is far from reality. Many legal hurdles have to be crossed before such an implementation can become a reality. How Smart Contracts are implemented in the future will depend on the following, (a) the level of automation in the execution of the Smart Contracts;(b) the variance between actual agreed terms and the code of the Smart Contract; and (c) the custodial right and/or discretion in the Smart Contract and its execution.<sup>81</sup>

That is not to say that the current legal framework is entirely inapplicable to Smart Contracts and Blockchain. Most traditional contract law concepts can still be applied to Smart Contracts. Firstly, the traditional concept of contract

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*proposed contract' by communicating to it. For instance, he communicates by making a payment. See, Durovic and Jannsen (n 8) 8; Tjong Tjin Tai, 'Force Majeure and Excuses in Smart Contracts' (n 67) 4.*

<sup>80</sup> Once the broker in that case put the criteria into a software, the software would seek and conclude contracts on the broker's behalf with no further requirement of human action. The court found that a contract was completed, *R (Software Solutions Partners Ltd) v HM Customs & Excise* (2007) EWHC 971 [67].

<sup>81</sup> Bourque and Fung Ling Tsui (n 42) 4.

formation, i.e. offer and acceptance equally applies to Smart Contracts. Using Blockchain, the use of cryptographic private keys is proof of commitment and consent.<sup>82</sup> Even otherwise, acceptance can also be demonstrated by conduct. One party transfers control of a digital asset, say Bitcoin, then, it by conduct communicates an unequivocal acceptance.<sup>83</sup> Therefore, a meeting of the mind expressed in code and consent expressed by the use of keys does not violate the legal requirement of *consensus ad idem*,<sup>84</sup> as long as it can be demonstrated that both parties had read and understood the terms of the contract.<sup>85</sup> Moreover, the contract should also be readable by the adjudicating authority. This is where the Ricardian Contracts can be useful.

Secondly, though there are disagreements by academicians about there being a promise and consideration in Smart Contracts<sup>86</sup> since unilateral contracts have been enforced by courts for a long time, there is no reason, why the same should not be enforced today. Exchange of a digital asset on the Blockchain can thus be a gift.<sup>87</sup>

One author argues that by choosing to use Smart Contracts, parties opt for an alternative regulatory system and not traditional contract law. Therefore, parties do not have the intention to create legally binding obligations,<sup>88</sup> (ie, *vinculum juris*).<sup>89</sup> However, the end result remains the same, i.e., enforcement

<sup>82</sup> G. Jaccard, 'Smart Contracts and the Role of Law' (2017) Jusletter IT 22; JJ Szczerbowski, 'Place of Smart Contracts in Civil Law: A Few Comments on Form and Interpretation' (Proceedings of the 12th Annual Scientific Conference, Czech Republic, 9 November 2017) <[ssrn.com/sol3/papers.cfm?abstract\\_id=3095933](https://ssrn.com/sol3/papers.cfm?abstract_id=3095933)> accessed 10 April 2020; Werbach and Cornell (n 46) 368. Since one party must post his (on-chain smart) 'contract' on the blockchain on platforms (for example Ethereum) and the other party accepted by the cryptographic key, such communication (the posting of the on-chain smart 'contract' on the blockchain) will likely be held as to be an offer.

<sup>83</sup> P Catchlove, 'Smart Contracts: A New Era of Contract Use' (2017) SSRN <[ssrn.com/abstract=3090226](https://ssrn.com/abstract=3090226)> accessed 11 April 2020.

<sup>84</sup> However, problems arise if at least one of the contracting parties does not understand the computer code but nevertheless conclude the smart contract. In this scenario the party who did not understand the computer code could try to advocate in hindsight for the existence of a 'mistake' and to rewind the smart contract. In German legal scholarship this case has been discussed but has always been rejected so far as an 'Inhaltsirrtum' according to § 119(1) BGB. It is said that in principle it is the risk of the parties to conclude a contract not knowing the underlying computer code. See, M Jünemann and A Kast, 'Rechtsfragen beim Einsatz der Blockchain' (2017) Kreditwesens 531, 533; Kaulartz and Heckmann (n 65) 622.

<sup>85</sup> Maneck Mulla, 'Validity of Electronic Contracts in India' (*Mondaq*, 4 May 2018) <<https://www.mondaq.com/india/contracts-and-commercial-law/699022/validity-of-electronic-contracts-in-india>> accessed on 12 April 2020.

<sup>86</sup> Werbach and Cornell (n 46) 341.

<sup>87</sup> Werbach and Cornell (n 46) 370.

<sup>88</sup> Savelyev (n 19)125.

<sup>89</sup> JW Salmond, *Salmond on Jurisprudence* (PJ Fitzgerald ed, 12th edn, Sweet and Maxwell 1966).

of the bargain between the parties.<sup>90</sup> Moreover, since ‘click-wrap’ and ‘shrink-wrap’ contracts are permissible, Ricardian Contracts’ acknowledgement that the Smart Contract is a valid legal agreement should also be legal.<sup>91</sup> In fact, mainstream law firms are still advising their clients that for the sake of certainty, a legal ‘wrapper’ ought to be created.<sup>92</sup> A similar ‘wrapper’ of ‘I Agree’ can be created for Smart Contracts and Ricardian Contracts.

Unfortunately, that is as far as traditional notions can be applied to Smart Contracts and Blockchain. The technology does not address issues of capacity and free consent. Though restitution remains a remedy, the contract cannot per se be void as it will remain on the Blockchain<sup>93</sup> and most likely will have self-executed.

Similarly, there exist issues of suspension and termination of the contract. Smart Contracts cannot be stopped voluntarily by parties, not by a central entity, court or any other supervisor,<sup>94</sup> even when there is a change of circumstances, or intent of the parties.<sup>95</sup> Therefore, even if a contract were to hold the contract illegal, it will be performed nonetheless.<sup>96</sup> However, there may be a solution. An Oracle can provide for court decisions, or arbitration awards to be communicated to the contract.<sup>97</sup>

Alternatively, a ‘Dispute Resolution Library’ may be provided in the Smart Contract where the arbitrators can not only instruct the Smart Contract but also amend it.<sup>98</sup> Furthermore, the keys can be crucial. While two parties would have the key, the third can be with the regulator, court, or arbitrator. Hence, if two parties use their keys, the contract can be modified.<sup>99</sup>

Another issue with Smart Contracts is that parties may not be able to anticipate all scenarios and prepare the code in advance. Though, in theory, all such questions can be left for Oracle, how many such Oracles should a contract

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<sup>90</sup> Savelyev (n 19) 125.

<sup>91</sup> Durovic and Janssen (n 8) 16.

<sup>92</sup> Clifford Chance, ‘Are Smart Contracts Contracts?’ (2017) *Talking Tech Clifford Chance* <[https://talkingtech.cliffordchance.com/content/micro-cctech/en/emerging-technologies/smartcontracts/are-smart-contractscontracts/\\_jcr\\_content/text/parsysthumb/download/file.res/Are%20smart%20contracts%20contracts.pf](https://talkingtech.cliffordchance.com/content/micro-cctech/en/emerging-technologies/smartcontracts/are-smart-contractscontracts/_jcr_content/text/parsysthumb/download/file.res/Are%20smart%20contracts%20contracts.pf)> accessed 4 April 2020.

<sup>93</sup> J Schrey and T Thalhofer, ‘Rechtliche Aspekte Der Blockchain’ [2017] *Neue Juristische Wochenschrift* 1431, 1436.

<sup>94</sup> Raskin (n 41) 309.

<sup>95</sup> Savelyev (n 19) 129.

<sup>96</sup> Werbach and Cornell (n 46) 373.

<sup>97</sup> Durovic and Janssen (n 8) 20.

<sup>98</sup> Kreis and Kaulartz (n 59) 346.

<sup>99</sup> Werbach and Cornell (n 46) 345.

contain, will remain uncertain. A possible solution to the problem may be that the parties by law will be required to use their keys and terminate the contract. On such termination, the self-execution will stop, and parties will have to resort to traditional litigation and enforcement mechanisms.

The other hurdle that Smart Contract faces is the current statutory protection granted to consumers in EU and UK Law where consumers are permitted to withdraw from the contract within a specified period, or return a good within seven days without assigning any reason.<sup>100</sup>

Similarly, how do regulators check for unfair trade terms? Also, there are requirements to draft consumer contracts in plain readable language under UNCTD, England.<sup>101</sup> These questions will require creative solutions. One such solution, as mentioned above, is the creation of certification bodies along with the statutory protections.

## VI. CONCLUSION

The preceding paragraphs reveal the potential for the use and implementation of Smart Contracts and Blockchain. The biggest hurdle appears to be drafting such complex contracts and the consumer understanding what she is signing up for. In a world where consumers already struggle with legal jargon and lengthy contracts, the use of Smart Contracts and Blockchain may actually be the panacea.

If Ricardian Contracts are formed with minimum terms and conditions, driven by Blockchain technology, consumers may be able to key in such requirements in a form. Such form can then be used to define the terms and conditions in the smart contract, while it continues to exist in a readable form. Hence, it fulfils traditional requirements of contract law. Such forms can be supplemented with exhaustive statutory protections which can be 'deemed' to be included in the Smart Contract. For rights arising out of such 'deeming provisions', the consumer can continue pursuing traditional litigation remedies. However, to the extent, the transaction can be 'if-then' conditions, the enforcement may be automated. Though this solution may appear to be 'piece-meal,' it is nonetheless, a step forward in levelling the lop-sided playing field of consumer contracts and rights.

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<sup>100</sup> Durovic and Janssen (n 8) 25.

<sup>101</sup> Council Directive 93/13/EEC of 5 April 1993 on unfair terms in consumer contracts [1993] OJ No. L95/29, art 5.

Similarly, Oracles can be a viable bridge between code and the real world. Creative use of such Oracles may fill gaps in the contract, especially when the parties are faced with questions of interpretation such as force majeure, good faith, etc. Alternatively, the use of cryptographic keys may permit suspension, termination, modification and regulation of these contracts.<sup>102</sup>

The prime advantage of self-enforcement is that it will lead to a role reversal as the consumer will be provided instant redressal and then a big company will determine whether it is worth pursuing a claim against a small consumer for restitution. While the solutions proposed in this paper are not foolproof, they nonetheless open possible frontiers in the empowering a consumer who has hitherto been receiving many statutory protections, but little effective remedy.

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<sup>102</sup> Kreis and Kaulartz (n 59) 342.