THE RECOGNITION OF SMART CONTRACTS IN JERSEY[1]

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This article examines Jersey law around the recognition of smart contracts as enforceable legal contracts. It considers whether contracting parties should receive a human readable translation of contractual terms written in computer code to provide valid contractual consent and whether Jersey law needs to recognise the concept of an electronic agent. This article concludes that, smart contracts can create enforceable legal contracts under Jersey law subject to satisfying the usual elements of a contract.

1. Introduction

1 Smart contracts have the potential to revolutionise contracting and legal practice. Elements of smart contracts are novel and, being de-materialised, challenge the traditional methods of conducting business in the "paper era".[2] Often described as "self-executing contracts" smart contracts effectively animate contracts. They can offer automated payment solutions, secure data transfer and constitute a new way of contracting (potentially transformative for, *eg*, finance contracts, by automating certain quantitative provisions; and, *eg*, conveyancing contracts, by automating updates to the public land registry). Using Nick Szabo's original example, a blockchain literate car can, using a smart contract, detect the occurrence of a default on the car finance and disable itself until payment is received.[3]

2 The term "smart contract" is a computer science term and not a legal term. A "smart contract" is computer code and not a contract *per se* in the legal sense. To constitute a legally binding contract the code

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[1] Abridged for the JGLR; originally written 28 February 2020 as a thesis for a Master's degree in Jersey law.

[2] Nick Szabo is a computer scientist and legal scholar. He distinguishes between the "paper era" and the "digital era" in N Szabo (1997) "Formalizing and Securing Relationships on Public Networks" https://nakamotoinstitute.org/formalizing-securing-relationships/ [accessed 31 October 2020].

[3] See note 2.

would need to satisfy the usual elements necessary to make a legally binding contract. Reference to "smart contracts" in this paper is to smart contracts that are intended to be valid legal contracts or smart legal contracts.

3 The enormous potential application of smart contracts creates a commercial imperative for Jersey law to recognise smart contracts as legal contracts enforceable in Jersey. This article focuses on whether a "smart contract" is capable of being interpreted and enforced as a valid contract under Jersey law and concludes that:

(i) ordinary rules of Jersey contract law apply to smart contracts;

(ii) some forms of smart contracts are capable of forming valid contracts under Jersey law without statutory intervention;[4]

(iii) it would be beneficial for Jersey to make a statement of its recognition of smart contracts as part of the forthcoming restatement of contract law; and

(iv) amendments to the Electronic Communications (Jersey) Law 2000 as amended by the Electronic Communications (Amendment of Law) (Jersey) Regulations 2019 (the "ECJL") are recommended to encourage smart contract usage in Jersey.

4 This article also considers whether smart contracts are a revolution or simply an evolution in ways of forming a contract. In applying the ordinary rules of contract law (Norman-derived customary law ("customary law")) it is evident that smart contracts are not a revolution. Smart contracts do re-write the rule book on how we transact, but not the fundamental legal principles of contracting. The marketplace has evolved, with online retailers, increased use of electronic signatures and more complex products (*eg* synthetic derivative securities) but the fundamental principles of law have survived.[5] It is better to adapt long-established principles of contract law[6] (even with inherent inconsistencies) than to guess the impact of a technology and attempt to legislate for it. Interpreting the technology using established principles and allowing the courts to clarify where necessary is more prudent. This is consistent with the approach of the

[4] See para 11 and 135 *et seq*.

[5] For example, implied warranties for quality of goods (although now codified in the Supply of Goods and Services (Jersey) Law 2009).

[6] Albeit that certain points are not settled in case law and at times there are areas which have proven to be "highly controversial in Jersey in recent times" (*Booth v Viscount* (see note 45, para 43)).

UK Jurisdiction Task Force ("UKJTF") which concluded that "the ordinary rules of contract law apply to smart contracts".[7]

2. What is a smart contract?

5 This section provides a basic overview of smart contracts to assist the legal analysis that follows.

2.1 *Smart contracts*

6 "Smart contract" is an umbrella term for "smarts" or computer code with no single legal definition. "Smart contract" is a computer science term referring to computer code that runs in certain blockchain systems (*eg* ERC-20 or ERC-721 using Ethereum) causing pre-defined outcomes to be performed when pre-defined conditions are met.[8] For example, if A occurs, the outcome is B. The smart contract code is run by nodes (the network participants) and when the pre-defined conditions are met, the ledger maintained on the network is automatically updated with the pre-defined outcome, *eg* the transfer of ether. Smart contracts are therefore referred to as being auto-executing or self-executing. The term "contract" is used loosely[9] as the "smart contract" may not always form an enforceable legal contract (see below).

7 Szabo first coined the term "smart contracts" in the 1990s[10] giving the following as examples of how smart contracts work: (i) a "humble vending machine"; and (ii) a blockchain literate car that could disable itself in the event of a default on the repayment of the finance arrangements relating to it.[11] In these examples, Szabo portrays the computer running the code (the contract) as performing certain tasks in the contract.

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[7] The UKJTF "Legal statement on cryptoassets and smart contracts" is accessible through the link on A Zmudzinski (2019) "Public Statement Aims to Define Legal Status of Crypto Assets in the UK" https://cointelegraph.com/news/public-statement-aims-to-define-legal-status-of-crypto-assets-in-the-uk [accessed 31 October 2020].

[8] The Bitcoin whitepaper summarises how blockchain and DLT work: S Nakamoto (2008) Bitcoin: A Peer-to-Peer Electronic Cash System. https://nakamotoinstitute.org/bitcoin/ [accessed 31 October 2020].

[9] Highlighting the need for unified nomenclature across law and technology.

[10] D Morris (2014) "Bitcoin is Not Just Digital Currency. It's Napster for Finance" http://fortune.com/2014/01/21/bitcoin-is-not-just-digital-currency-its-napster-for-finance/ [accessed 31 October 2020].

[11] See note 2.

2.2 *Usage*

8 There are endless uses in Jersey for smart contracts and distributed ledger technology ("DLT") more broadly. A few examples give some context:

(i) The issuance and transfer of digital assets: digital representations of traditional securities (*ie*, security tokens with the rights and obligations of a traditional security which are transferable in de-materialised digital form); utility tokens; and other non-security tokens can be issued and transferred by smart contract. This would enable on-chain transfers of securities and instantaneous updates of registers, *eg* shares in share transfer companies owning properties, could be transferred on the blockchain (if the distributed ledger was nominated as the register of members/securities holders).

(ii) Payment solutions for immediate settlement: bypassing lengthy settlement times and removing intermediaries, agents and clearing houses (and their costs) from the process, smart contracts enable immediate on-chain settlement.[12] Examples include the JP Morgan DLT derivatives margin payment solution[13] and the HSBC custody solution.[14] In the retail context: (a) BMW, General Motors and Ford are testing blockchain payment systems in their cars;[15] and (b)

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[12] Bank for International Settlements ("BIS") anticipates efficiencies in clearing and settlement by reducing T+2 settlement to instantaneous settlement on-chain (or as the parties may specify). BIS quotes Mainelle and Milne (2016) who estimated that DLT can—

> "reduce back office costs by up to 50%. A study . . . by Santander InnoVentures (2015) estimates that $15–20 billion could be saved annually in the broader banking industry."

See M Bech and R Garratt (2017) *BIS Quarterly Review*, 17 September 2017. Central bank cryptocurrencies. BIS https://www.bis.org/ publ/qtrpdf/r_qt1709f.htm [accessed 31 October 2020].

[13] H Partz (2019) "JPMorgan Automates Derivatives Margin Payments With DLT Firm" https://cointelegraph.com/news/jpmorgan-automates-derivative s-margin-payments-with-blockchain-tech [accessed 31 October 2020].

[14] Ledger Insights (2019) "HSBC Securities to use Blockchain for Securities custody" https://www.ledgerinsights.com/hsbc-securities-blockchain-custody / [accessed 31 October 2020].

[15] A Zmudzinski (2019) "BMW, General Motors, Ford to Start Testing Blockchain Payments in Cars" https://cointele graph.com/news/ bmw-general-motors-ford-to-start-testing-blockchain-payments-in-cars [accessed 31 October 2020].

Mastercard[16] and Ikea[17] are using smart contracts to facilitate settlement.[18]

(iii) Transferring and validating information, such as:

(a) voting (*eg* by security holders), thereby reducing the administrative burden of convening and voting at meetings.

(b) public records: if Jersey introduced DLT public registers, they could automatically update on trigger events.

example (1) The register of immovable properties could update on the change of legal owner;

example (2) A confidential register of wills (registered on satisfaction of relevant formalities) could release a will to the family of the testator following his/her death, but allow codicils or new wills to be made in sequential order, thereby reducing the costs, delay and emotional burden of lost, destroyed or uncertain wills.[19]

2.3 *Smart legal contracts*

9 Smart legal contracts (a subset of smart contracts) are those which satisfy the conditions necessary to form a binding and enforceable contract.[20] The Chamber of Digital Commerce ("CoDC") identifies two further categories:

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[16] J Wieczner (2017) "Mastercard Will Now Let You Pay With Blockchain—But Not Bitcoin" https://fortune.com/ 2017/10/20/mastercard-blockchain-bitcoin/ [accessed 31 October 2020].

[17] D Palmer (2019) "IKEA in 'World First' Transaction Using Smart Contracts and Licensed E-Money" https://www.coindesk.com/ikea-in-world-first-transaction-using-smart-contracts-and-licensed-e-money [accessed 31 October 2020].

[18] See https://www.liquidshare.io/ .

[19] France has a register of wills, the *Fichier Central des Dernières Volontés*, which only *notaires* (sworn draftsmen/lawyers) can access. England has an optional register where law firms hold their own registers. Neither jurisdiction has the same execution formalities as Jersey.

[20] See The Chamber of Digital Commerce (2018) "Smart Contracts: Is the Law Ready?" Smart Contract Alliance. https://digitalchamber.org/smart-contracts-whitepaper/. [accessed 31 October 2020]. See also the ISDA, Linklaters whitepaper (2017) "Whitepaper Smart Contracts and Distributed Ledger—A Legal Perspective". https://www.isda.org/a/6EKDE/smart-

(a) *internal smart contracts*: a smart legal contract that captures the entire agreement between the parties, *eg* a transaction on standard binary terms selling a digital asset from Alice to Bob. There are two types:

(i) where the code represents the whole agreement between the parties, superseding human-readable clauses which are considered explanatory; and[21]

(ii) where the code represents only part of the contract, but that part contains the operative terms of the contract and supersedes the clauses written in human-legible language;

(b) *external smart contracts*: negotiated contracts with bespoke terms that cannot be reduced to a binary outcome although quantitative elements (*eg* asset transfer and interest payments) could be automated, *eg* syndicated loan agreements. They are written predominantly in human-parsable languages which prevail over the code (an interpretation clause is required for that effect).

10 The internal v external distinction is important in Jersey because it relates to the interaction between the human-parsable terms and computer code.[22]

11 This article focuses on whether smart contracts can create legally enforceable contracts under Jersey law. It is submitted that:

(a) external contracts are more likely than internal contracts to meet the requirements of a valid Jersey law governed contract because humans can read their terms and determine whether to consent to those terms (see developed further at Section 3).

(b) internal contracts which are not human-parsable and override human-parsable terms are less likely to constitute valid contracts under Jersey law unless the non-human-parsable automated part of the

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contracts-and-distributed-ledger-a-legal-perspective.pdf [accessed 31 October 2020].

[21] The CoDC paper references Werbach and Cornell:

> "if a court concludes it (the conventional contract) better reflects the parties' meeting of the minds, it would be trying to supersede the smart contract, not interpret it."

[22] In the UK, the UKJTF did not consider these distinctions in any detail, simply noting that there is a "spectrum" within which contractual terms are defined by code. Questions as to whether the code reflects the agreement between the parties will be determined objectively by extrinsic evidence. See note 7.

code which is inconsistent with the human-parsable terms is peripheral.[23]

12 In Jersey this position will persist whilst the subjective approach to contractual consent prevails (discussed at para 27 *et seq*). For a human counterparty to subordinate its understanding of contractual terms to computer programming which he/she cannot understand is not in my view a sound basis for contractual consent. It may be commercially desirable for precise computer code to take precedence over lengthy legal prose, but the implementation of technology does not arise in a legal vacuum and traditional legal analysis must be applied to it, including the established principles of contractual consent.

13 This distinction between internal and external smart contracts is likely to be a short-lived given advancements in technology. Projects are underway to enable lawyers to draft contracts in human-parsable language which can be converted into computer code and create new mark-up languages (*eg* (i) DAML, the Digital Asset Modelling Language which is coded in the source code, but appears as human language and is converted into bytecode on the ledger,[24] and (ii) FpML, the Financial Products Markup Language managed by ISDA for the electronic dealing and processing of OTC derivatives trades).[25] This means that it is only a matter of time before programs align human-parsable language with computer-readable code thereby removing the potential for uncertainty and inconsistency.

3. Can smart contracts create enforceable contracts under Jersey law?

14 This section examines the traditional requirements for creating a contract under Jersey law and shows how smart contracts are capable of satisfying each requirement.

3.1 *Choice of law*

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[23] *Prestige Properties Ltd* v *Styles* 1989 JLR 96 supports the proposition that an endorsed contract with some amendments is an implied acceptance of the other terms. Accordingly, if the acceptance altered peripheral details, there may still be acceptance of the overall terms.

[24] Digital Asset, "A New Language for a New Paradigm: Smart Contracts" (2018) https://medium.com/daml-driven/a-new-language-for-a-new-paradigm-smart-contracts-648cc30294ad [accessed 31 October 2020].

[25] Page 12 ISDA (2020) ISDA Legal Guidelines for Smart Derivatives Contracts—Interest Rate Derivatives. Available at: https://www.isda.org/a/I7XTE/ISDA-Legal-Guidelines-for-Smart-Derivatives-Contracts-IRDs.pdf [accessed 31 October 2020].

15 For Jersey law to apply to a smart contract, it should be governed by Jersey law. This could be determined by the governance documents of the relevant blockchain or by a term of the specific smart contract. The ordinary methodology for determining the governing law of traditional contracts should apply, *ie* parties make an express choice or take into account, for example, their physical locations, the situs of an asset, performance of services or the jurisdiction of incorporation of an issuer.[26] For example, Jersey law would be an appropriate governing law for smart contracts relating to immovable property in Jersey or tokens issued by a Jersey company. Where neither the identity nor location of the contracting parties is known, the architects of the blockchain ecosystem would need to select an appropriate governing law agreed by those participating in the network.

16 Traditional rules of private international law focus on the *lex situs* of tangible property. However, for dematerialised intangible property, analysis has previously focused on the situs of the ledger (book entry) recording the proprietary rights.[27] The decentralised nature of the blockchain network can complicate this analysis as DLT systems often have a cross-border dimension making it "less than clear where assets and their records are located in a DLT environment." [28]

17 Therefore, parties intending Jersey law to apply to their smart contract should include an express term to that effect (although this does not prevent claims that another governing law applies). Where there is a conflict of laws, there is a good argument to suggest that the ordinary conflict of law principles should apply. The UKJTF concluded likewise and suggested some factors to determine the governing law. These included:

(a) the location of (i) any relevant off-chain asset; (ii) any centralised control; (iii) a particular participant controlling a particular crypto-asset;[29]

(b) the law applicable to the relevant transfer (*eg* due to parties' choice).

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[26] Notwithstanding the decentralised ledger, private permissioned blockchain ecosystems could nominate a jurisdiction where the ledger is deemed situs for compliance with relevant laws.

[27] Financial Markets Law Committee (2018) "Report: Distributed Ledger Technology and Governing Law" http://fmlc.org/ report-finance-and-technology-27-march-2018/ [accessed 31 October 2020]. Para 1.2. Para 4.4.

[28] *Ibid*, para 1.2.

[29] The UKJTF gave the location of storage of the private key as an example of control.

3.2 *Contracts*

18 Assuming the parties choose Jersey law, either in the blockchain terms of usage or in the smart contract terms or Jersey law otherwise applies, the elements of forming a valid Jersey contract must then be satisfied. Smart contracts are capable of satisfying these requirements.

19 Where a smart contract transfers a store of value (monetary or otherwise) from Alice to Bob in exchange for a benefit (however defined), it is a contract for value or *contrat à titre onéreux*. Alice confers a right on Bob with the intention of securing a reciprocal benefit from Bob. A feature of smart contracts on the public blockchain is that the parties may be anonymous or pseudo-anonymous, so Alice does not know that she is contracting with Bob. This is not unique to smart contracts. For example, when contracting with an agent, Bob might not know the identity of the agent's principal. Similarly with contracts concluded in e-market places (eBay or Airbnb *etc*), the counterparties might not be easily identifiable.[30] It is not a requirement of Jersey law that parties be known to each other to create legal relations, but it is of practical importance for serving notice and suing for breach of contract.

20 There are instances when the identity of the counterparty is relevant in so far as it affects the value and provenance of the subject of the contract, *eg* Bob buys Sir William's copy of *La Glose*. The book's value is affected by the provenance *viz*. that it was owned by Sir William. Buying a book from Alice would not justify the premium.

3.3 *Contract formation*

21 Jersey law requires the four keystones of (a) consent, (b) capacity, (licit) *objet*, and (d) (licit) *cause* (*per Selby v Romeril*[31] and *Marett v Marett*).[32]

22 Smart contracts can satisfy these requirements although there are some novel features which may arise. Some traditional contracts

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[30] The UKJTF notes at paras 20 and 156—

> ". . . a smart legal contract between anonymous or pseudonymous parties is capable of giving rise to binding legal obligations . . . there is no requirement under English law for parties to a contract to know each other's real identity."

See also *Siu Yin Kwan v Eastern Insurance Co Ltd* [1994] 2 AC 199, 207.

[31] *Selby v Romeril* 1996 JLR 210.

[32] *Marett v Marett* 2008 JLR 384.

involve additional formalities such as powers of attorney but even these requirements could be satisfied using blockchain technology.

23 Intertwined with consent is the need for the parties to intend to create legal relations. Smart contracts transfer a store of value from Alice to Bob in return for, *eg*, Ether. The mutuality of obligations[33] establishes that the arrangement is intended to create legal relations.

24 To give clarity to the position, the blockchain terms and conditions of usage could include an acknowledgement by the parties of their intention to enter into legal relations. The Guernsey Ordinance[34] deals with this by including a rebuttable presumption to this effect. Whilst not advocating a blockchain specific statute, a rebuttable presumption (in statute) could give an element of contractual certainty. However, this goes beyond the approach taken for traditional contracts.

3.3.1 *Consent*

25 Pothier said the consent of the parties is the "essence of the contract of sale"[35] (and of contracts generally). Consent is required for parties to reach an agreement and is essential to the operation of the legal maxim enshrined in Jersey law "*La convention fait la loi des parties*"[36] (the agreement makes the law of the parties). It is this key principle that promotes the inherent flexibility of Jersey contract law and assists with the legal recognition of smart contracts. The parties are free to reach a binding agreement by smart contract if they see fit.

26 Under Jersey law, valid consent requires (a) a definite offer to be bound; (b) an unequivocal acceptance of that offer; and (c) certainty of terms.

Subjective v objective approach

27 The Royal Court in *Selby v Romeril*[37] did not state whether consent should be assessed on a subjective basis (looking for the

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[33] The court in *1995/105 Dairy Hill Real Estate v Rent Control Tribunal* (unreported) held that mutual promises are not enough alone to establish an intention to create legal relations.

[34] Defined below para 101 *et seq*.

[35] R Pothier (1761) *Treatise On The Contract of Sale*. Paris and Orléans Translated by LS Cushing (nd). Italy: Rotomail Italia S.p.A. Article III.

[36] *Donnelly v Randall's Vautier Ltd* 1991 JLR 49 at 57, *Doorstop Ltd v Gillman* 2012 (2) JLR 29, *Basden Hotels Ltd v Dormy Hotels Ltd* 1968 JJ 911.

[37] 1996 JLR 210

subjective intention of the individual parties to the contract)[38] or objective basis (what a properly informed reasonable man would take to be the position). This article assumes that the current Jersey approach is a subjective test[39] rather than the objective test applied by the English courts (which "promote[s] certainty and predictability in the resolution of contractual disputes").[40] This may change and legal authorities in Jersey are inconsistent on this point,[41] but it is an important distinction when evaluating the weight of the various sources of customary law. Generally, in practice, contractual interpretation in Jersey closely follows the approach taken in England. However, some contractual dispute authorities highlight fundamental differences between Jersey and English law (*eg cause* v consideration, *erreur* v misrepresentation), and not least whether Jersey follows a subjective approach (which is the prevailing view) or an objective approach to contractual consent.

28 Marett v Marett[42] is authority for the principle that the subjective approach to contractual consent should be followed. As Sir Philip Bailhache has written—

> "One of the important consequences of the principle [*la convention fait la loi des parties*] is the implicit emphasis upon the mutual consent of the parties"

and, citing *Incat Equatorial Guinea Ltd v Luba Freeport Ltd*[43] that—

> "*volonté*, or will, which binds them together and requires that the mutual obligations which they have agreed be given effect by the courts . . . A man is bound only by his will, and because he is the best judge of his own interests the best rules are those freely agreed by free men . . ."[44]

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[38] J Kelleher "Another Puzzling Contract Judgment" (2018) 22 *Jersey & Guernsey Law Review* 78

[39] *Marett v Marett* 2008 JLR 384 overruled earlier lines of case law (*Leach v Leach*) 1969 JJ 1107 and *Mobil Sales & Supply Corp v Transoil (Jersey) Ltd* 1981 JJ 143 which applied an objective approach to consent.

[40] Lord Steyn "Contract Law: Fulfilling the Reasonable Expectations of Honest Men" (1997) 113 LQR 433.

[41] In *Trico Ltd v Buckingham* [2020] JRC 009 the Royal Court applied English law sources and the objective approach.

[42] 2008 JLR 384.

[43] 2010 JLR 287 at 294

[44] P Bailhache "Subjectivity in the formation of a contract—a puzzling postscript", (2016) 20 *Jersey & Guernsey Law Review* 160 at para 8.

29 The law applying to smart contracts should follow the law applied to traditional contracts. A detailed analysis of the objective v subjective approach is set out in the judgment of the Court of Appeal in *Booth v Viscount.*[45] In *Booth* the court observed:

(a) that the debate should not be over which source of law to follow (English principles or French) but instead whether to follow the objective or subjective approach; and

(b) that those advocating the objective view should not "sweep away existing Jersey concepts and superimpose English contract law".

The author's primary reservation about adopting the objective approach is the erosion of the inherent flexibility afforded by customary law. The contractual freedom embodied in "*La convention fait la loi des parties*" assists with the legal recognition of smart contracts, because it embodies the freedom which:

> "entails that a person is free to decide whether or not to bind himself by contract and to determine the consent of his commitment, the corollary of that . . . *consensus ad idem* [meeting of the minds] means that intention will suffice, without there being any requirement as to form."[46]

30 Whilst the objective approach can be substituted for the subjective approach, it will be submitted that this could lead to potentially unfair outcomes, particularly in the context of smart contracts written in code which humans cannot read or where the code supersedes the human-parsable translation.

31 It is argued that some subjective element of contractual consent should be preserved to safeguard against such potentially unfair outcomes. However, the Court of Appeal acknowledged in *Booth v Viscount* that the subjective view (as adopted in French law) was not without its problems: notably the indefinite uncertainty of discovering a defect in consent at a later date that could lead to the contract being void.

32 The discussion over objective v subjective approach is just as relevant to smart legal contracts as it is to traditional contracts. Arguably, contracting by smart contract leans more towards the objective approach given the potential lack of direct negotiation between parties (potentially anonymous) and increased reliance on the

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[45] *Booth v Viscount* 2019 (2) JLR 1.

[46] H Beale, A Hartkamp, Kötz and D Tallon (2002) *Ius Commune Casebooks on the Common Law of Europe, Cases Materials and Text on Contract Law* North America (US and Canada): Hart Publishing, para 1.3.2.A at 115.

limited written communications and/or code to demonstrate their respective intentions.

33 Some members of the judiciary appear to take the view that the subjective approach is less desirable than the objective approach because the objective approach is more modern: the court in *Calligo* stated that the Jersey contract law needs to be updated from its customary law roots to "suit the needs of a modern community which is also a sophisticated international finance centre"[47] and the "requirements of life in the 21st century". Whilst a clear and consistent contract law is desirable, it is not clear that a modern approach (if that means fundamentally different) is required or indeed that an objective approach achieves that. This modern community needs to apply Jersey contract law to smart legal contracts and it is the subjective approach, stemming directly from the customary law principles, which assists both with their legal recognition and in providing "individualised justice".[48]

34 Following the objective approach to contractual consent, to the exclusion of the subjective approach, makes consent mechanical in so far as consent will effectively be deemed (or not) from the written word of the contract and its circumstances. The distinction between the two approaches is important because it can lead to very different outcomes in practice. The examples below highlight these different outcomes in the blockchain context.

(a) *Example 1: transferring a token from Alice to Bob via smart contract (running human-parsable code).* Applying the objective approach to contractual consent, the outcome is assessed by the facts: the smart contract is agreed when the code is run. This automatically performs the terms of the contract and Bob becomes the tokenholder. Applying the subjective approach, the outcome is unchanged if the code reflects the human-parsable terms.

(b) *Example 2: transferring a token from Alice to Bob via smart contract (running code that is not human-parsable).* Computer code that is not human-parsable cannot be reviewed by the counterparties. Taking the objective approach, some construction of the facts could lead to an argument that contractual consent had been given to terms the parties had not read. A similar approach is taken under Guernsey Ordinance (defined below) which gives legal effect to contracts not reviewed by a human (see para 101 *et seq*). This may be efficient for a

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[47] *Calligo Ltd v Professional Business Systems CI Ltd* 2017 (2) JLR 271, at para 25.
[48] See note 44.

contract with simple terms but may cause issues with a more complex contract. By comparison, applying the subjective approach, if the terms of the contract are not human-parsable, it may be difficult to show that the minds met or that there was a *volonté* of the parties.

(c) *Example 3: transferring a token from Alice to Bob via smart contract (running code that is not human-parsable) the terms of which will transfer the token to Charlie if the DeFi reaches X. Neither Alice nor Bob realise there could be an onwards transfer.* Applying the subjective approach, Alice and Bob could claim they had not agreed to the onwards transfer as it did not reflect their intentions. This argument would not be available if the objective approach were applied. Taking the objective approach, the facts would show that the code contained the contractual terms that were exchanged between Alice and Bob.

The above examples indicate that, whilst there are advantages to the objective approach in terms of simplicity and contractual certainty, the disadvantage is the potential for unjust outcomes to arise.[49]

35 If the main advantage of the objective approach is legal certainty, then there are other methods to achieve certainty including:

(a) *introducing a limitation period*. On its expiry, counterparties would be barred from claiming their consent was invalid. The limitation period could be: (i) a time period; or (i) the subsequent transfer of the token. This would provide certainty in the subsequent chain of transactions and mitigate the risk that subsequent transferors were transferring assets that they did not have title to (pursuant to the maxim *nemo dat quod non habet*); and

(b) *introducing objective elements to the subjective approach*. Such as reference to any human-parsable elements of the written contract and/or other evidence showing the acceptance of the terms such as by conduct.[50]

36 Adapting and applying Jersey law to prevailing market conditions by judicial interpretation is important in a small jurisdiction such as

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[49] Sir Philip Bailhache observes in his article at para 13 that "a subjective test makes for more individualised justice" citing *La Motte Garage* as an example where the objective and subjective tests produce different results.

[50] Professor Fairgrieve notes there are subjective elements in the English objective approach, see D Fairgrieve, Institute of Law Jersey (2018): *Jersey Law Course 2018–2019 Law of Contract*, It may be that the solution is not a binary choice between subjective or objective, but an approach which blends the two.

Jersey which has a relatively slim statute book. Sir William Bailhache[51] observed that *volonté* (the meeting of minds)—

> ". . . result[s] from the political liberalism of the age of reason and of the economic liberalism of the 19th century, where obligations imposed from outside should be as few as possible. *A man is bound only by his will, and because he is the best judge of his own interests the best rules are those freely agreed by free men* . . . the same rationale appears in the commentaries of Berault, Godefroy & d'Aviron on *La Coutume Reformée de Normandie* . . . being published in 1684 . . ." [Emphasis added]—

ie, *volonté* is what a man consents to being bound by. In this way *volonté* and consent are co-dependant because without *volonté* there can be no consent.

37 One might compare the fintech revolution with the "political liberalism" and "economic liberalism of the 19th century" that Sir William mentioned. The characteristics of economic liberalism are evident in the current market demand for efficiencies and democratisation of capital markets, *eg* by reducing barriers to entry for retail investors.[52] Of course, some obligations "from outside" (see quote above) are necessary in the 21st century as, for example, regulators need to regulate to help prevent money laundering and protect investors. This should not detract from the central principle that, if counterparties have a will to contract using a specific technology, they should not be prevented from doing so or from being bound by that will—as envisaged by customary law on this point of principle. The lack of a blockchain statute is of no consequence. In this way, the spirit of customary law and the freedom of contract (both in terms of the content of the contract and method of contacting) is as relevant to modern commerce as it was in the 17th, 18th and 19th centuries.

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[51] At para 22 of his judgment in *Incat Equatorial Guinea Ltd v Luba Freeport Ltd* 2010 JLR 287 at para 22.

[52] For example, Robinhood offers fractional stock trading, *eg* fractions of Amazon shares trading around $1,700 can be acquired for $1.00 See Klebnikov (2019) "Robinhood is the Latest Firm to Offer Fractional Stock Trades. What's all the Hype About?" https://www. forbes.com/sites /sergeiklebnikov/2019/12/13/robinhood-is-the-latest-firm-to-offer-fractional-stock-trades-whats-all-the-hype/#1c2c9946a7c4 [accessed 31 October 2020].

38 The Jersey Law Commission[53] was critical of the customary law, citing difficulties including: (i) inaccessibility of Norman texts; (ii) language barriers (with French being regarded as "totally alien"); and (iii) ancient concepts remaining "frozen in time".[54] It is submitted that, since the Commission reports were published, customary law has become more, not less, accessible. The launch of the Jersey Law Course at the Institute of Law ("IoL") and the publication of the contract law study guides have taught advocates and *écrivains* a consistent view of Jersey contract law (among others) from a comprehensive and accessible text.[55] In addition, there is more case law and learned articles in the *Jersey and Guernsey Law Review* on these topics. The salient provisions of customary law are contained in the study guides and copies of Pothier and Domat and Fairgrieve's comparative law text on contract law are available to buy online. The way to avoid customary law becoming "frozen in time" is to publish Norman texts (and translations) so they can be studied and commented upon rather than treating them as museum pieces.[56] The translation of the Grand Coutumier and the proposed translation of the *Très Ancien Coutumier* will assist in this regard.

39 The Commission proposed to clarify the Jersey contract law by adopting of a statutory framework modelled on the Indian Contract Act of 1872, essentially the adoption of the English common law of contract.

40 To codify, by extension, means that Jersey would adopt blockchain-specific legislation in some form. Codification is challenging and a restatement may be a more sympathetic approach as it enables a settled position on the law to be pronounced without extinguishing the spirit of customary law. It is important to keep the spirit of customary law alive as it enshrines into Jersey law an inherent flexibility to be applied to changing market practice.

41 The rapidly changing nature of the market requires any restatement to be future-proofed to avoid the restatement being

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[53] Jersey Law Commission (2002), *Consultation Paper—The Jersey Law of Contract*, Consultation Paper No 5.

[54] Jersey Law Commission (2004) *The Law of Contract—Topic Report No 10* (2004) https://jersey lawcommission.files.wordpress.com/2015/ 06/2004-topic-report-on-the-law-of-contract.pdf [accessed 31 October 2020], p 7.

[55] Prior to the foundation of the Institute of Law, advocates and *ecrivains* were self-taught.

[56] Pothier has been published in English on a number of occasions, including by the New York Public Library.

outdated by technological developments.[57] This is relevant to contracting by smart contract (as they are increasingly being seen as a credible means of contracting): numerous initiatives have been launched, exploring blockchain solutions for standardised contracts such as ISDA[58] and discussion around the digital future for syndicated loans.[59] The restatement will need carefully to navigate between a subjective or objective approach to contractual consent or a combination. This is because:

(a) as set out above, where smart contracts are written only in programming code (internal contracts) they are not currently human-parsable (this may change as technology develops). This means that humans could not read, understand or approve the terms of the contract in order to provide valid consent (as required for a meeting of minds taking the subjective approach) unless a human-parsable translation is provided that prevails in the event of inconsistency (external contracts);

(b) as smart contracts potentially enable contracts to become more commoditised and standardised and less negotiated, parties' contractual intentions over standardised contracts may become less nuanced. If so, it may be appropriate for less emphasis to be placed on the parties' subjective intentions and to follow a more objective approach focusing on the written terms; and

(c) the objective approach seems to offer a more certain outcome desirable for meeting the demands of business efficacy; but

(d) contractual certainty should not be achieved at the expense of individualised justice. A blended approach may therefore be the solution. A subjective element may become even more important in conserving equity and justice and ensuring that contractual intention is

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[57] For example, terminology used in the JFSC ICO guidance is already out of date referring to ICO and not addressing "STO"s (security token offerings). See https://www.jerseyfsc.org/industry/guidance-and-policy/application-process-for-issuers-of-initial-coin-offerings/ [accessed 31 October 2020].

[58] See ISDA, Linklaters whitepaper (2017) "Whitepaper Smart Contracts and Distributed Ledger—A Legal Perspective". https://www.isda. org/a/6EK DE/smart-contracts-and-distributed-ledger-a-legal-perspective.pdf [accessed 31 October 2020].

[59] Clifford Chance (2019) "The digital future of syndicated loans: Loans & Tech: Now and the future" https://talkingtech. cliffordchance.com/ en/industries/fintech/the-digital-future-of-syndicated-loans.html [accessed 31 October 2020].

reflected in contractual terms if humans are bound to contractual terms written in code that they cannot read or understand.

Remedies

42 One advantage of smart contracts is that they enable faster transaction speeds. Consequently, it is foreseeable that remedies to contractual disputes may be demanded at a similar pace to contract formation. There may be a demand for faster rather than traditional legal remedies. As arbitration can be more time and cost effective than legal proceedings, it may be possible for an arbitration function to be incorporated into the consensus mechanism on the blockchain. In such cases, the nodes participating in the arbitration consensus would need to examine the evidence on an objective basis, probably by looking only to the written material (including code) available on the blockchain ecosystem and written submissions of the parties. If so, the same approach taken to contract formation (subjective, objective or a blend) may need to be applied to contractual remedies. This may also mean that even if a subjective approach to consent in contract formation is retained, the process to assess the evidence will create a hybrid approach.

43 In addition, standardised remedies may develop to deal more efficiently with contractual disputes (such as (i) a pre-agreed unwinding of the contract on certain terms; or (ii) a quasi-arbitration to process claims, possibly automated or via the consensus mechanics on the blockchain). If so, it is likely to be impossible or impractical for the counterparties' full subjective intentions to be examined or accounted for in the remedial process. Consequently, the requirements for contractual consent should include objective elements to enable a consistent approach to be taken to contract formation and remedies, for example, a consideration of the written terms of the contract.

44 The objectivity could be achieved in a manner similar to that present in the French civil procedure where weight is placed on written submissions and evidence rather than oral submissions.

45 The UKJTF had a slightly different theory, that smart contracts would reduce the need for legal intervention altogether because they "may prevent intentional non-performance by a party and avoid or limit factual disputes and disputes about interpretation of terms".

Offer and acceptance

46 Returning to the elements of contract formation, in the example of a smart contract transferring a store of value from Alice to Bob in exchange for Ether, the offer is made by Alice sending the terms of a smart contract to Bob which is then accepted by Bob in transferring

the Ether to the smart contract address. Further examples include algorithmic trading and robo-investing, where computer programs run algorithms reflecting a certain investment strategy to select order terms to offer to the market[60] and the terms to accept. In both cases these are examples of acceptance by conduct. The acceptance should be clear as there is no intervening opportunity for the parties to negotiate terms.

47 In a public blockchain, where parties are unknown to each other, negotiation is limited given the limited ability for the parties to communicate outside of the blockchain ecosystem. However, in a private blockchain, greater negotiation may be possible.

Certainty of terms

48 For a smart contract to constitute a legal contract, it must have certainty of terms. This is a logical component of the parties agreeing contractual terms that reflect their intentions. In the smart contract context, where terms can be written only in computer-parsable code (internal contract), the crucial point is whether any material, non-human-parsable terms of the contract can be deemed sufficiently certain to enable a valid contract to be formed. It raises the question whether the terms need to be capable of being understood by the parties. If the parties cannot read the terms of the contract, they cannot (i) understand it; (ii) be certain of its terms; or (iii) check that the proposed terms reflect their mutually agreed intentions.

49 This is important because, if "certain" does mean "understandable", it could lead to different outcomes depending on whether the objective or subjective approach to consent is taken. Taking the objective approach, once the terms are accepted, a reasonable man would say that the parties had agreed to be bound by the terms. Taking the subjective approach, no consent could be given if the terms were not understood.

50 The type of smart contract (internal or external) therefore affects the risk of this uncertainty arising, for example:

(a) internal contract—where the smart contract is written only in code and is not human-parsable, it is debatable whether the terms have sufficient certainty. If certainty of terms simply means to have identifiable terms, the UKJTF stated "there should be no difficulty in identifying terms (they will comprise the source code)". Identifying the source code containing the terms is one matter, but it is quite a

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[60] See, *eg*, L Scholz, "Algorithmic Contracts", 20 Stan Tech L Rev 128 (2017).

separate matter to read and understand its terms sufficiently to enable a decision to be made whether or not to be bound by them. Under Jersey law, so long as the subjective approach to contractual consent prevails (notwithstanding the mixed authorities on this point), there is an inference that to have certainty, the terms should be understood (or at least be able to be understood) by the parties. If a smart contract is written only in computer-readable code there is arguably no certainty of terms for a source-code illiterate human unless there is a human-parsable translation;

(b) where part only of the contract is written in code and not human-readable, proving the certainty of terms may become pivotal in the event of inconsistency between human-parsable and computer-readable elements of the contract (as by extension it relates to proving that such terms reflect the parties' mutually agreed intentions). Although, *per Prestige* if the inconsistency relates to a peripheral matter it should not be material[61];

(c) external contract—where the contract is fully human-readable and some terms have been automated (*eg* payment of interest) certainty of terms would be easily demonstrated.

51 The type of smart contract could become crucial because if the terms do not coincide with the terms of the offer understood by the parties, there is an *erreur obstacle* (where there has been no meeting of minds). This goes to the very heart of the contract. An *erreur obstacle* can be as to (i) the nature of the contract; (ii) the *objet* of the contract; or (iii) the *cause* of the contract. If any of these elements is absent, then the contract will be a *nullité absolu*.

52 Under French law, there are two types of *erreur* and two types of *nullité* that arise:

(a) *erreur obstacle*—where there is no meeting of minds and no contract is formed; and

(b) *erreur* leading to a *vice de consentement* which "does not destroy consent: it merely negatives consent, or to simplify again, the mistake concerns the validity of the contract".[62]

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[61] M Finck and V Moscon (2018) "Copyright Law on Blockchains: Between New Forms of Rights Administration and Digital Rights Management 2.0", https://link.springer.com/article/10.1007%2Fs 40319-018-00776-8 [accessed 31 October 2020].

[62] R Sefton-Green (2005) *Fraud and Duties to Inform in European Contract Law*. Cambridge: Cambridge University Press, p 6.

53 Arguably, if the parties cannot read the terms of the contract, they cannot: (i) understand it; (ii) be certain of its terms; or (iii) ascertain whether the terms reflect their intentions, and there is an inference that these requirements ought to be present taking the subjective approach to contractual consent. This concern was shared by Szabo who raised two concerns about contracts written in code: (i) human counterparties not understanding the code and therefore the terms of the contract; and (ii) the computer not carrying out the human counterparties' intentions. Szabo cautions that the computer processing units involved in the messaging (which run the smart contract) may or may not be acting in accordance with the intentions of the human user.

54 This is a key challenge to any purported "agency" relationship (however tenuous) between human and computer.[63]

55 Conversely, following the UKJTF approach, it can be argued that the non-human-parsable terms (the source code) would have sufficient certainty and, accordingly, that the parties can intend to accept such terms irrespective of whether they understand them. This would lead to clear outcomes but may lead to difficulties, particularly if applied to contracts with members of the public.

56 For example, Natwest Bank announced a blockchain project to record data in the house buying process.[64] Taken together with the HM Registry project to produce a blockchain land registry, it is feasible to predict a future state where properties (including residential properties) are bought, sold and mortgaged on the blockchain.

57 There are a few simple practical solutions to make code or internal contracts human-parsable:

(a) provide human-readable translations of the code; and

(b) use pro-forma contracts in human-parsable language. This could be embedded in the governance documents of the blockchain protocol. This is ideal for simple contracts. A rider could be included for non-automated negotiated terms to be populated. These would be qualitative rather than quantitative terms (*eg* payment terms) and would need not be reduced to code to: (i) be valid contractual terms; or (ii) enable the parties to benefit from automation of the quantitative elements; in both cases the human "translation" would prevail.

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[63] see para 95 *et seq.*

[64] Ledger Insights 2020 "NatWest Bank in blockchain consortium to streamline the mortgage process" https://www. ledgerinsights. com/natwest-bank-blockchain-consortium-mortgage-coadjute/ [accessed 31 October 2020].

58 Solutions to this may become more established with the development of smart contracts which are both human-parsable and computer-parsable. Mougayar[65] suggests that developments will—

> ". . . include user-friendly entry points, like a Web browser. That will allow any business user to configure smart contracts via a graphical user interface, or perhaps a text-based language input."

Human counterparties will then be able to draft contracts in human language using software that codes the automatable provisions into computer executable code. Such projects are underway.

3.3.2 *Capacity*

59 If the essence of a contract lies in consent,[66] each contracting party must be capable of giving such consent. Under Jersey law, for natural persons, the age of majority is 18.[67] There is a presumption that persons aged 18 are capable of giving valid consent, although certain medical conditions prevent the giving of consent.[68]

60 To mitigate the risk of incapacity, private blockchain platforms could incorporate a gating mechanism that checks age and capacity by incorporating some form of self-certification or independent identity verification. This would not mitigate the risk of the counterparty lacking capacity on other grounds, but this is an accepted risk of dealing with retail clients in online or non-face-to-face transactions. Public blockchains where parties are anonymous would be at risk.

61 Similar solutions can be used for corporate entities verifying their corporate existence which could be verified by reference to Public Registries and authorised signatories.

3.3.3 *Objet*

62 *Objet* is a "party's obligation of performance under a contract: What a party promises to do under the contract by way of performance

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[65] W Mougayar (2016) *The Business Blockchain*, New Jersey: John Wiley & Sons, p 43.
[66] R Pothier (1761) *Treatise On The Contract of Sale. Paris and Orléans.* LS Cushing (trans) (n.d.). Italy: Rotomail Italia S.p.A.—Article III.
[67] Article 1 Age of Majority (Jersey) Law 1999.
[68] Article 4 (1) Capacity and Self-Determination (Jersey) Law 2016.

/ discharge of his or her obligations."[69] *Objet* must be (a) certain, (b) possible, and (c) lawful.[70]

63 *Objet* relates to either a thing (*res*) or a service (*factum*).

64 Applying the limbs to the example of the transfer of a token:

(a) the *objet* is certain (identifiable) - it is the obligation to transfer the token, a *res*;

(b) as long as the token exists and there are no transfer restrictions, the transfer will be possible; and

(c) if the token does not relate to an illicit matter (see below) the transfer will be lawful.

65 Demonstrating whether an *objet* is possible should be straight-forward in a smart contract context. Smart contracts are described as "auto-executing" because they can be programmed to perform tasks when certain conditions are met. This feature makes smart contracts suited to performing certain quantitative contractual terms (*eg* the transfer of tokens and payment of ether on a given date) without further instruction by either party.

66 However, usual contractual principles should apply where the underlying *objet* does not exist or is flawed. To use examples given by Pothier,[71] one cannot sell a horse (if it is dead) or a house in Orleans (if it has burned down). Nevertheless, one can sell a "mere expectation"[72] of something which does not yet exist (such as wine which may be made). Therefore tokenisation (*eg* of real estate developments or derivatives) should not present any novel issues.

Lawful

67 Factors affecting whether the *objet* is lawful relate to whether the *objet* of the obligation is *per se* lawful. Under Jersey law, this is interpreted as not unlawful.

68 Blockchain-related assets, cryptocurrencies and other digital assets are not prohibited under Jersey law[73] as they are in some

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[69] *HRCKY Ltd v Hard Rock Ltd* 2019 (2) JLR 47, para 27 (CA) per Sir William Bailhache, President.

[70] *Marett v Marett* 2008 JLR 384, para 59.

[71] See note 66, art I.

[72] See note 66, art I.

[73] There are many jurisdictions where this is not the case. See https://www.profitconfidential.com/cryptocurrency/bitcoin/top-countries-bitcoin-legal-illegal/. This potentially raises conflicts of law questions in cross-border

jurisdictions.[74] Digital assets should therefore be subject to the same principles of legality under Jersey law as the subject matter of any other contract, *eg* digital assets relating to prohibited substances or sanctioned activities would be unlawful and fail this limb.

69 It is likely that being lawful includes meeting all relevant regulatory requirements. In the context of a Jersey entity issuing a digital security, this may include the issuer obtaining a consent pursuant to the Control of Borrowing (Jersey) Order 1958 (or future regulatory equivalent) and a consent pursuant to the Companies (General Provisions) (Jersey) Order 2002[75] depending on the number of security holders and number of persons to whom the offer is circulated. Cross-border transactions will require a more extensive review of the global regulations in jurisdictions for primary and secondary markets, on which the asset will be available, particularly if issued/transferred on a digital asset exchange.[76]

70 Factors relating to licit *objet* are relevant to licit *cause* (see below) because a transaction with an unlawful *objet* is likely to have an unlawful *cause*:

> " . . . thus in bilateral contracts there is a fundamental interdependence between *objet* and *cause*. If one party's obligation lacks an *objet*, then it is likely that the other party's obligation will lack a *cause*."[77]

3.3.4 *Cause*

71 The final limb is (licit) *cause*. In *Marett v Marett*[78] *cause* was found to be the reason for the contract, why it is that an obligation under a contract is owed.

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digital assets transactions where the token is legal in the jurisdiction of one party but not the other. For an overview of jurisdictions where bitcoin is legal and not legal see Cryptonews (2020) "Countries where Bitcoin is Banned or Legal in 2020" https://cryptonews.com/guides/countries-in-which-bitcoin-is-banned-or-legal.htm [accessed 31 October 2020].

[74] See Library of Congress (2019) "Regulation of Cryptocurrency Around the World" https://www.loc.gov/law/help/crypto currency/world-survey.php [accessed 31 October 2020].

[75] These consents relate to the issuance of securities by Jersey entities and circulation of a prospectus respectively.

[76] See Basel Committee on Banking Supervision (2019) "Statement on crypto-assets". https://www.bis.org/publ/bcbs_nl21.htm [31 October 2020].

[77] *HRCKY Ltd v Hard Rock Ltd* [2019] 2 JLR 47 at para 29.

[78] 2008 JLR 384.

72 *Cause* is essentially the rationale or reason for the parties to contract. In practice, it is often explained to foreign lawyers by likening *cause* to consideration under English law;[79] however, the Royal Court has firmly distinguished between the two.[80]

73 The concept of *cause* fits blockchain transactions of all types. By nature, a token on a blockchain transferring a store of value or operating as a medium of exchange, operates on the basis of reciprocity. The "value" transferred being anything from monetary value (*eg* the value ascribed to an ether) to the value ascribed to the sharing of data.

74 The *cause* for a party contracting is the rationale for contracting. Smart contracts should be subject to the same principles of *cause* as any other contract. The discussion above regarding certainty of terms is relevant here as the terms ought to make the cause obvious.

75 In considering *Marett*, the Court of Appeal in *Booth v Viscount* intentionally does not rule on whether *cause* is assessed on an objective or subjective basis. Rather the court noted the uncertainty in modern French law given that the new French Civil Code did not require *cause* at all in the formation of a contract.[81]

76 Smart contracts are not immune to *cause* being negated by *vice de consentement* (the usual exceptions to autonomy of will). There are three categories of *vice de consentement*:

(a) *dol*;

(b) *violence*, being (i) duress and (ii) undue influence, and

(c) *erreur*.

77 These are discussed below in Section 4.

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[79] Note the discussion above regarding the objective v subjective approaches to contractual consent.

[80] *Osment v Constable of St Helier* 1974 JJ 1, *Granite Products Ltd v Renault* 1961 JJ 163, *Wightman v Cathcart Properties Ltd* 1970 JJ 1433.

[81] Article 1128 of the French Civil Code requires only: (i) consent of the parties; (ii) their capacity to contract; and (iii) a licit and certain content. Commentators have however noted that other areas of the Civil Code still make a reference to the purpose of passing contracts, *eg* art 1170 and art 1162. See also D Fairgrieve (2016) *Comparative Law in Practice Contract Law in a Mid-Channel Jurisdiction.* Bloomsbury Publishing plc, p 77.

4. Do smart contracts help or hinder issues with consent and authority?

78 This section addresses whether the fact that a contract takes the form of a smart contract increases or reduces (or may increase or reduce) the occurrence of:

(a) defective or lacking contractual consent by reason of a *vice de consentement*; and

(b) defective authority with computers running code not authorised by the counterparties.

4.1 *Vice de consentement*

79 Pothier stated that contractual consent must be given freely.[82] Impediments or defects to such consent can result in the contract being capable of being set aside (*vice de consentement*) or being void *ab initio* (as if no consent had been given at all).

80 According to the court in *Steelux Holdings Ltd v Edmonstone*,[83] a *vice de consentement* is where there is no consent, no meeting of minds between the parties, which allows the innocent party to treat the contract as void. However, the Court of Appeal indicated in *HRCKY Ltd v Hard Rock Ltd*[84] that the contract would be automatically void (rather than merely treated as void).

81 In a blockchain context, it is arguably easier to demonstrate (objectively) that consent to contract has been freely given, in particular if certain features are incorporated into the blockchain ecosystem such as:

(a) click-through screens—requiring acknowledgement of, and consent to, terms of use and terms of the contract (assuming they correctly translate the underlying code);

(b) evidence to demonstrate computer access time and location of both parties;

(c) in relation to a private blockchain network, identifying counterparties before being granted entry to the platform and confirming any relevant matters (such as intention to contract; capacity; receipt of legal advice; or that the parties are not known to each other *etc*); and/or

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[82] R Pothier (1800) *A Treatise on Obligations Considered in a Moral and Legal View*, N Newbern (trans). Volume 1 of 2. (1802): Martin & Ogden.
[83] *Steelux Holdings Ltd v Edmonstone* 2005 JLR 152.
[84] [2019] 2 JLR 47 at para 64.

(d) a two-stage consent, *eg* consent is given on one page and re-confirmed on a second page.

82 However, even incorporating such features does not guarantee that the parties have freely agreed to the terms (*ie* free from duress or fraud) or that those terms reflect their intentions or will. Key elements of *vice de consentement* are briefly discussed below alongside an evaluation of how smart contracts could heighten or mitigate the risks of these exceptions occurring:

Dol (fraudulent or false conduct)

83 If a counterparty is induced to contract by fraudulent or false conduct (*dol*) or some other "artifice" the contract will be void. The Court of Appeal in *Hard Rock*[85] held that where a contract is induced by *dol* it will be void and every clause will fail. *Whittaker*[86] determined that "*dol*" includes fraudulent misstatements.

84 Smart contracts must be subject to the same principles of *dol* as traditional contracts. The type of *dol* most relevant to smart contacts is fraudulent misstatements (*eg* where a misstatement is made off-chain, but affects a smart contract where the code does not constitute the entire agreement between the parties).

85 From an evidential perspective, smart contracts can assist by recording statements made on-chain and identifying whether a statement has been embedded in a chain of transactions.[87] For example:

(a) all documentation including marketing information (teasers, heads of terms, circulars, offering memoranda *etc*) can be stored and accessed by counterparties and potential counterparties on-chain. This would clearly show all written statements made;

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[85] See note 69.

[86] As cited in D Fairgrieve, Institute of Law Jersey (2018): *Jersey Law Course 2018–2019 Law of Contract* p 115.

[87] If misstatements are embedded in a chain of transactions it may indicate that these are innocent or negligent misrepresentations. Innocent or negligent misrepresentations do not amount to *dol*, as there is no intention to deceive. Instead, this may result in the other party's consent being vitiated on the ground of *erreur.*

(b) in a private blockchain context, advisers (*eg* lawyers and tax advisers) can take part in the consensus mechanism and confirm they have approved or verified the transaction material;[88]

(c) oracles (see para 129) can be used to confirm certain matters of fact have occurred, *eg* the FTSE index or the NASDAQ DeFi index has reached a certain level; and

(d) in a chain of transactions, the full transaction history (and documentation) can be made available, thereby reducing the potential for data to be incorrectly transcribed.

86 Each of the above examples is also relevant to *erreur* (see below).

87 Given the ability for transaction history to be stored on-chain and for misstatements to be included in documentation used in chains of transactions, smart contracts may be at increased risk of misstatements. The original misstatement may be either: (i) an innocent representation made on the basis of a mistaken belief thought to be correct and may result in the other party's consent being vitiated on the ground of *erreur*; or (ii) made with the intention to defraud and be *dol* (see also *erreur* at para 89).[89] Subsequent misstatements contained in subsequent transactions, if made by innocently replicating misstatements contained in earlier transaction documentation, would likely vitiate consent on the ground of *erreur*. These are the same risks that apply today in traditional contracts and would be dealt with in the same manner.

Violence

88 There are two principal types of *violence:* (i) duress; and (ii) undue influence. In each instance, a smart contract should be subject to the same arguments regarding duress and undue influence as a traditional contract. Consequently, smart contracts will be affected by the same inconsistencies in case law in this area (as to whether the English or French approach should prevail) as a traditional contract.

Erreur

89 The two types of *erreur* are: (i) *erreur sur la personne*; and (ii) *erreur sur la substance* and should apply equally to smart contracts as for traditional contracts save that some features of blockchains could mitigate the risk of *erreur sur la personne* arising.

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[88] This does not mean that misstatements will not occur if advisers are involved, but indicates a level of diligence has been carried out.

[89] The court in *Hard Rock* held that *erreur* and *dol* should not be elided.

90 *Erreur sur la personne* only applies where the identity of the contracting party is the main *cause* for the contract. Given the anonymity of counterparties in the public blockchain context, *erreur sur la personne* is unlikely to arise. In the private blockchain space, however, this would follow the same principles as a traditional contract. Features can be built in to the blockchain protocol to mitigate this risk by verifying the identity of counterparties.

Jersey law on misrepresentation

91 Irrespective of the substantive law in this area, and whether or not it is a separate area of law relating to pre-contractual discussions, such substantive law should apply equally to smart legal contracts as to traditional contracts.

92 Following *Hard Rock*, the fact that a *vice de consentement* (whether that be *dol*, *erreur* or misrepresentation to the extent misrepresentation may exist in Jersey law) makes a contract void, highlights the importance of including in a smart contract:

(a) representations and indemnities to deal with misstatements, in particular when dealing with assets which are frequently traded (at risk of prior representations causing previous contracts transferring the asset to be void);

(b) a mechanism dealing with the practicalities of unwinding the contract in the event of a misstatement or incorrect representation to return the parties to their pre-contractual state. For example, in the context of a digital asset, code automating the re-transfer of the asset to the seller and a refund of the payment to the buyer; and

(c) an arbitration mechanism in the event of a dispute or claim of *vice de consentement*.

93 Traditional remedies in the courts would of course remain available to the parties, but an in-built mechanism may be a practical means of resolving simple disputes quickly and cost-efficiently.

4.2 *Defective authority*

94 The potential physical separation of counterparties in the smart contract context is not novel. Pothier specifically contemplated that people could contract remotely by: (i) letter; or (ii) through the intervention of an agent *per epistolam*, *aut per nuntium*[90] (by letter or by messenger).

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[90] See note 35—art III, para 32.

Are computer programs forming smart contracts "agents"?

95 Taking the second example, "intervention of an agent", there is a questionable line of opinion and legislation supporting the notion that the smart contract is an agent for the human operator.

96 The argument in support of this notion is that: (i) smart contracts on Ethereum each have an address and can store value or data; (ii) the networked computer running programs operated by the human operator is the agent for the human operator; and (iii) the smart contract is autonomous (self-governing) insofar as it is only controlled by the code. It is this autonomy that distinguishes smart contracts from other technologies (such as the internet, which is simply a medium allowing parties to communicate, but, where the parties remain in control). However, the smart contract is not fully autonomous, it is simply code run on a network of computers and controlled by the code. The fact that a smart contract has an address and can store value does not mean that it owns the value it holds. It is similar to (i) a bank account, with a distinct number capable of holding a balance for someone; or (ii) a humble vending machine, holding cans until purchased. Accordingly, the smart contract is not capable of being appointed as an agent.

97 Szabo[91] rightly expressed a concern about humans not understanding the underlying code controlling the smart contracts. In writing about smart contract protocols he observed that:

> "A protocol in computer science is a sequence of messages between at least two computers . . . These programs act as proxies, or agents, for human users, who communicate their preferences *via* users' interfaces. We distinguish protocol endpoints by names such as 'Alice' and 'Bob' . . . which may or may not be under the control of, or taking actions contrary to the intent of, the human user."

98 This concern is amplified applying the objective approach to contractual consent as this focuses on the written contractual terms (rather than intentions) which may be concluded between the parties' "agents" (computer programs) and contain terms or have consequences that neither party intended. This would be exacerbated where parties cannot identify each other in order to make contact and independently verify their respective intentions.

99 As Szabo observes:

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[91] See note 2.

> "Human users typically do not have full knowledge of the protocol in question, but rather a metaphorical understanding . . . Unlike most real-world contracts, protocols must be unambiguous and complete."

100 A party's "metaphorical understanding" (or lack of understanding) of the code may present a challenge to the purported "agency" relationship as it exposes the principal to the risk of being bound to unintended consequences resulting from that code. This underlines the importance of parties receiving a human-parsable translation of the code so as to form contractual intentions (whether subjective, objective or a mixture) and the extent of the authority given to the agent. Some jurisdictions, *eg* Guernsey, are comfortable with this risk and recognise computer programs as electronic agents and the resulting contracts formed by such electronic agents, even where the human counterparties had not read the code. The advantage of accepting this risk is the resulting contractual certainty.

Guernsey Ordinance

101 Guernsey has adopted legislation that recognises smart contracts are concluded using an electronic agent.[92] The Electronic Transactions (Electronic Agents) (Guernsey) Ordinance, 2019 ("the Ordinance") recognises electronic agents can conclude contracts and provides that such a contract:

> "shall not be denied legal effect, validity, enforceability or admissibility solely because its making, formation, creation or delivery involved the action or use of one or more electronic agents."

This appears progressive, but using electronic agents to form contracts is not without risk and appears unnecessary.

102 The Ordinance provides that contracts can be formed either: (i) among electronic agents;[93] (ii) between an electronic agent and a natural person;[94] or (iii) with information in electronic form:[95] "where

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[92] "Electronic agent" is defined in the Ordinance as:

> "a computer program or electronic or other automated means used independently to initiate an action or to respond in whole or in part to information or actions in electronic form or communicated by electronic means, without review or action by a natural person."

[93] Article 2(3) Ordinance.

[94] Article 2(4) Ordinance.

[95] Article 2(5) Ordinance.

no natural person was aware of, or reviewed, the electronic agents' actions or the resulting terms"[96] or reviewed such information.

103 This gives a statutory recognition to the practice of counterparties accepting terms and conditions ("T&C") that they have not read. These statutory provisions potentially diminish the significance of contractual consent (by deeming it to have taken place where no human has had the ability to review the terms of the contract). There is a difference between choosing not to review T&C and not being able to read T&C (*eg* if not human-parsable). Whilst parties are clearly free to choose to contract even when not able to read the T&C, it is not without risk. If smart contracts become a prevalent method of contracting (especially with members of the public), this approach could have significant risks. For example, an individual may acquire a token (*via* smart contract) that results in losing his/her life savings. This creates a curious new form of agency where:

(a) the agent (the code) is not a legal person;

(b) the agent's actions are limited to running pre-determined code and consequently the agent is unable to exercise any discretion;

(c) the principal is unaware of the extent of the authority delegated to the agent if the principal does not understand the code being run.

104 Bowstead & Reynolds[97] (the English law authority on agency adopted as authority under Jersey law)[98] define "agency" as:

> " . . . the fiduciary relationship which exists between two persons, one of whom expressly or impliedly manifests assent that the other should act on his behalf so as to affect his legal relations with third parties, and the other of whom similarly manifests assent so to act or so acts pursuant to the manifestation . . . "

This definition clearly demonstrates that the agent must be: (i) a legal person; (ii) a fiduciary; (iii) appointed and authorised by the principal to affect legal relations; and (iv) able to act in accordance with such appointment and authority. The Ordinance meets only half of these elements: the first two elements are absent; the third element is satisfied through deemed authority; the fourth is satisfied because the actions of the agent (the code) are limited to running the code, illustrating that "the manifestation", the actual authority, must

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[96] Article 2(3) Ordinance.

[97] *Bowstead & Reynolds on Agency* (2017) 21st edn. Consolidated Mainwork Incorporating Second Supplement. UK: Sweet & Maxwell Ltd.

[98] *Izodia PLC v Royal Bank of Scotland Intl Ltd* 2006 JLR 346, para 77.

encompass the terms of the code—potentially problematic if the principal does not understand those terms. This raises the question of why does the code need to be an agent? If parties chose to contract by running code they do not understand, why do they need to be deemed to have appointed an agent to do that (and nothing more) on their behalf.

105 The Ordinance describes the electronic agent as acting "on behalf of a person" and is deemed to be appointed as an agent authorised to contract on behalf of the counterparties under the usual rules of agency in Guernsey. This aspect of the agency relationship is consistent with English and Jersey law and, in the contract law context, consistent with *Chitty on Contracts* which provides that the agent is merely a medium through which assent is given:

> "A contract made by an agent as such, is, in law, the contract of the principal. The agent is considered merely as the medium by which the contract is effected; and his assent is merely the assent of his principal."[99]

If merely a medium to effect a contract, under the Ordinance, the electronic agent must be deemed to have such broad authority to contract on behalf of its principal that it is unnecessary for the principal to be aware of the existence of any contract which the agent concludes (or its contractual terms, *ie* the terms of the code). This is hard to justify when "the manifestation", the actual authority of the agent to act, must encompass the terms of the code. If the agent has no discretion, is not a fiduciary and has no function other than running the code as programmed, it is questionable whether an agent is needed at all (particularly given the risks of a principal being deemed to appoint an agent to run code and enter into contracts on terms the principal does not understand). The central issue that this obfuscates is the interaction between: (i) the parties' understanding of the terms of the contract; and (ii) contractual consent. When the developments in artificial intelligence and Internet of Things technology[100] are overlaid with electronic agency, it is foreseeable that once the rights of the principal (to give actual consent to the contractual terms) are eroded, it may be difficult for the principal to re-assert those rights.

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[99] H Beale (2019) *Chitty on Contracts Volume II Specific Contracts.* 33rd edn. Sweet & Maxwell Ltd, para 31–039.

[100] For example, where household appliances are connected to the internet and have cryptocurrency wallets to purchase products online when their sensors detect such products are required, *eg* a fridge orders milk when it has run out, or a car pays for parking.

106 The Ordinance is noteworthy because it is commercially attractive from the perspective of legal certainty and because Guernsey has a similar customary law heritage to Jersey. However it is not recommended that Jersey follow this approach. Such legislation would need to be constantly amended to keep pace with technological developments. It is submitted that the recognition of an electronic agent by the Guernsey Ordinance is flawed.

107 Nevertheless, Jersey can learn from the Ordinance. It would be helpful to state the elements applicable to smart contracts and their recognition as smart legal contracts (to give certainty to parties using the technology who will be bound). They could include:

(a) contractual consent (subjective or objective or a blend);

(b) a rebuttable presumption that the consent given was valid—in reality this would follow a fairly objective approach to consent and look to objective evidence to show the parties' consent had been given (*eg* by way of a click-through screen); and

(c) link any rebuttal of that presumption to the usual grounds for defective consent under Jersey law (*ie* whether there was a *vice de consentement*).[101] The period for rebuttal should also be time-limited. For a contract for the immediate delivery of a digital asset then the period for rebutting the presumption should be low, *eg* five business days.

108 The above elements would enable some subjective elements to be blended with the otherwise fairly objective approach needed to give sufficient certainty to the parties contracting. Maintaining a subjective element is desirable because, if contracting by smart contract does become market standard, individuals and, in particular, vulnerable persons, will need protection from an overly objective approach if, for example, the contracts affect material matters such as their life savings. The FCA appears to have similar concerns having banned the sale of crypto-asset derivatives to the retail market.[102]

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[101] The objective, subjective or blended approach should not be any different for smart legal contracts and should reflect the position for traditional contracts. Any recommendations in a restatement of contract law on this matter should apply equally to smart contracts and traditional contracts.

[102] Financial Conduct Authority (2020) "FCA bans the sale of crypto-derivatives to retail consumers" https://www.fca.org.uk/news/press-releases/fca-bans-sale-crypto-derivatives-retail-consumers#:~:text=These%20products%20cannot%20be%20reliably,secondary%20market%20(eg%20cyber%20theft) [accessed 31 October 2020].

Can computer code hold assets?

109 The idea that smart contracts "hold" digital assets in quasi-custodial and escrow arrangements has led to the argument that the code must therefore be an agent. BIS questions this, giving the example of smart contracts where digital assets are held suspended (not held by either party) and where programmers assert it is held by the contract, rather like a vending machine storing and dispensing cans on payment of monies.

110 In law, there are rules concerning the ability to transfer title to assets. Title to an asset typically remains the seller's until the buyer complies with certain conditions. In an escrow arrangement, an escrow agent may hold an asset for the seller until the conditions are met, whereupon it is held for the buyer on new terms. In the smart contract context, the terms of the code (the contract) could provide for the asset to belong to the transferor until such time as the transfer conditions are met, whereupon the ledger would update to reflect a change of ownership. It is submitted that the smart contract need not be an agent to do this.

Is computer code a separate legal entity?

111 BIS noted that certain players in the European Commission advocate the smart contract being its own legal entity. This is a step further than the electronic agency position under the Guernsey Ordinance.[103] Recognising code as a separate legal entity seems to be unnecessary. A smart contract is code. Code is unable to owe fiduciary duties or to be liable for its actions and omissions. Code will simply run as written (or not, if the code contains an error) and does not need legal personality to do that. By way of comparison, words in traditional contracts are not given legal personality; they simply describe contractual rights and obligations. To suggest otherwise is a legal absurdity.

112 Legal personality is given to natural persons with capacity and to legal persons (*ie* bodies corporate) which are given this status.[104] Laws state what the constitutive documents of the legal person should contain and what statutory obligations the legal person owes to its members. As these are creatures of statute, they require a natural

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[103] Although the Ordinance recognises the ability of the electronic agent to enter into contracts, which is a characteristic of legal personality.

[104] For Jersey companies it is the Companies (Jersey) Law 1991; for separate limited partnerships, it is the Separate Limited Partnerships (Jersey) Law 2011, and so on.

person to carry out decision-making or generally to act on their behalf, *eg* directors (who in turn rely on natural persons, if a corporate director). Those decision-makers derive their power from the constitutive documents, statute and general law and, in turn, owe fiduciary duties to the legal person. None of this seems to work if legal personality is ascribed to code. Logic should not be thrown to the wind by the introduction of novel and ill-considered legal concepts in order to fix a non-existent problem (*eg* recognising code as an agent or giving it separate legal personality, when neither is required for smart contracts to function).

113 It is, however, plausible that legal personality or fiduciary duties could apply to a blockchain ecosystem, or decentralised autonomous organisations ("DAOs"), or to node operators. Requirements could be introduced for DAOs to meet minimum standards for protocols and bye-laws including placing fiduciary duties on the node operators who validate and participate in the consensus mechanism, *eg* to act independently, with due care and skill, and *bona fide*. This approach would also enable governments and regulators to ensure that key rights and obligations are dealt with in the blockchain protocol and ecosystem, *eg* by requiring certain minimum technical standards to be met, including as to security; or by requiring minimum rights and obligations to be contained in the terms of use of the protocol or resulting smart contract code. In addition, in relation to tackling money laundering and CFT, this could be achieved by (i) requiring network participants and their location to be identified; (ii) requiring insurance; or (iii) incorporating a feature to protect rights relating to the sale of goods and services (such as a time period within which the contract can be reversed to deal with a statutory return policy).

Smart contracts are messages

114 As quoted above, Pothier contemplated contracting remotely by letter.[105] Contracting by letter involves an exchange of messages. The exchange of messages is central to the conclusion of smart contracts. In listing the characteristics of smart contracts, Mougayar[106] refers to smart contracts as "software code representing business logic that runs a blockchain",*ie* computer to computer messaging, via code. It therefore appears that smart contracts are simply an evolution in letter-writing. We have seen an evolution in messaging technology before: from letter to email.

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[105] See note 66, art III, para 32.
[106] See note 65 p 42.

115 One novel feature of smart contracts is their apparent autonomy. However this autonomy should not be overstated. Mougayar[107] notes that "[t]hey are closer to an event-driven construct, more than artificial intelligence." If so, the perceived autonomy seems exaggerated and in practice it simply means that code can be written to effect certain quantitative outcomes in certain quantitative circumstances.

4.3 *Concluding contracts electronically*

116 As a medium for messaging in electronic form, the code underlying a smart contract (intended to give rise to a legal contract) and its deployment on a blockchain network is "electronic communication" pursuant to the Electronic Communications (Jersey) Law 2000 ("ECJL").[108] Below is an analysis of how ECJL enables contracting by smart contract (although amendments to the Law are recommended).

117 Smart contracts fall within the scope of ECJL because the code of the smart contract and manner of its deployment are "a communication of information transmitted in electronic form" (art 1). Accordingly, an offer and acceptance can be expressed by means of electronic communication for the formation of a smart contract (art 4).

118 For the purposes of art 8(1), the blockchain protocol would be the "information system" distributing the source code of the smart contract (the electronic communication) which operates automatically.[109] In this way, ECJL deals with "self-executing" contracts in the same way as contracting *via* email, without needing to establish an agency relationship (unlike the Ordinance).

119 In terms of contractual consent, art 8(4) ECJL allows the counterparty to assume that "the electronic communication received was what its originator intended to dispatch, and to act on that assumption." In other words, there is an allowable assumption that the source code of the smart contract reflects the intended terms of the originating party. If the counterparty accepts those terms, there should be a "meeting of minds" sufficient to constitute consent. In this way,

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[107] See note 65 p 43.

[108] "'[E]lectronic communication' means a communication of information transmitted—

(a) by means of guided or unguided electromagnetic energy or of both; or

(b) by other means, but, while in electronic form . . ."

[109] Programmers would need to advise whether the description fits the smart contract infrastructure but, if not, minor amendments could be made to the ECJL to ensure that it applied.

and if the requirements of art 8 are satisfied, ECJL makes a clear statement that the parties (dealing directly) can be assumed to intend the terms communicated; *ie* the terms of the source code accepted by the counterparty represented the originator's intentions. ECJL therefore supports the centrality of consent and the meeting of minds.

120 In terms of concluding the contract, the use of the public–private keys represents the parties' signature to the smart contract and the act signifying the acceptance by the parties of the terms of the contract. Public–private key cryptography involves the generation of two sets of unique keys:

(a) public keys (which encrypt the message); and

(b) private keys (which decipher the encryption enabling the parties to access the encrypted messaging contained on the code). It is the private key which also fulfils the function of the signature—it enables the sender of the message digitally to "sign" the message.

The typical analogy regarding the key status is a bank account (the public key) and a PIN (the private key) which enable access to the funds in the bank account.

121 On receipt by the recipient counterparty, the recipient counterparty uses the originator's public key to verify the originator's signature (which is done automatically). Article 12 ECJL recognises the use of electronic signatures but currently its application is limited to signatures in the case of "a person required by an enactment to provide a signature . . ."

122 This is of limited utility. The application is further limited by the requirement at art 12(1)(a) ECJL for a "method [to be] used to identify the person and to indicate the person's approval of the information communicated".[110] This requirement might be satisfied if the public–private key cryptography method is deemed sufficient to enable a person to be "identified" and demonstrate approval, although this will depend on whether a public or private blockchain is used (given the pseudo-anonymity of parties on public blockchains).

123 Potential amendments to ECJL include:

(a) finessing art 12(1)(a) to capture contracting by smart contract;

(b) bringing signatures to any document in scope (*ie* not limited to a signature required by an enactment)—this would also cater for changes in legal practice following COVID-19 and the marked increase of electronic signatures for concluding contracts;

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[110] There are further requirements for the signature of government entities.

(c) whether specific execution requirements and formalities (such as being witnessed by a Jersey advocate (*eg* certain powers of attorney and wills)) could be satisfied by electronic signatures for both the signature and to verify the signature:

(i) a private blockchain-based solution would appear to satisfy this—an advocate could participate in the consensus to approve the transaction or update of the blockchain once he/she has ensured that the relevant legal requirements have been satisfied;[111] and

(ii) Article 12(3) ECJL addresses this to some extent by providing that:

> "a signature, seal, attestation or notarisation is not to be denied legal effect, validity or enforceability only because it is in electronic form"; and

(d) a non-exhaustive list of acceptable forms of electronic signatures, to give certainty to the market, *eg* click-through acceptance of terms.

124 Article 8 ECJL preserves existing legal principles by stating at art 8(7) that nothing in that article affects the law of agency or the law on the formation of contracts, meaning that art 8 ECJL can be applied in parallel to the developments of such laws.

5. Contractual remedies and unwinding smart contracts

125 This section contains a discussion of:

(a) features of smart contracts that might assist in contractual disputes; and

(b) potential new contractual remedies made possible by DLT.[112]

126 The ease of access to swift and cost-effective contractual remedies will become as critical as the ease and efficiency of forming smart contracts. Increased transaction speed could mean that transactions are not well-planned, resulting in more disputes. It is

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[111] It is now widely accepted in the UK that deeds can be executed electronically. See the HM Land Registry guidance: https://www.gov.uk/government/publications/execution-of-deeds/practice-guide-8-execution-of-deeds#electronic-documents-with-electronic-signatures. [Accessed 31 October 2020].

[112] Traditional contractual remedies and methods of dispute resolution should apply to smart contracts as they do to traditional contracts, but these are not addressed below.

therefore foreseeable that market practice will demand "self-help remedies" to enable parties to deal efficiently with contractual issues among themselves, *eg* including terms at the outset for the automatic reversing of the contract or triggering the automatic payment of damages, without requiring the parties to resort to the traditional avenues of litigation which are costly and time-consuming (although these options would remain available).

5.1 *Features of smart contracts which may assist in contractual disputes*

Inherent audit trail

127 DLT and smart contracts have an inherent audit trail. Mougayar[113] said:

> "Smart contracts, being computer programs, are just the enabling technology, but the consequence of their actions can be made part of a legal agreement . . . A smart contract outcome could be used as an audit trail to prove if terms of legal agreement were followed or not."

128 This feature, together with article 9 of ECJL (which allows evidence in electronic form to be given evidential weight), could transform the disclosure process in litigation. Evidence would be readily available, tamper-proof and less likely to be contested.

Oracles

129 Oracles are data feeds which verify real-world events or "values" in a secure and trusted manner by transferring external data to the blockchain for on-chain use. If used in a blockchain protocol, the computer running the smart contract code can ascertain whether the pre-defined conditions have been satisfied. In this way, oracles can transform legal contracts by independently triggering the performance of certain terms of a contract (*eg* warranty claims or the payment of interest) when the oracle confirms that a certain real-world event has occurred (the pre-defined condition). This extrinsic data, once input by the oracle, can be captured on-chain and: (a) cannot be disputed by the parties; and (b) may be used as evidence in a contractual dispute. This may be particularly useful in avoiding disputes relating to breaches of covenants, because oracles can be used to trigger automated payments on blockchain. For example, in a construction contract, oracles can prove weather conditions using data from off-

[113] See note 65, p 42, para 3.

chain sources such as the Met Office. This can assist with construction delays by proving weather conditions at the relevant time.

5.2 *"Self-help" contractual remedies*[114]

Rescinding contracts

130 Smart contracts run in accordance with the source code. They are coded from the outset and the code is immutable. A smart contract could therefore be coded with certain event triggers which enable the contract to be rescinded (*ie* unwound so as to return to the *status quo ante*). Event triggers could include:

(a) a failure to meet pre-set quantitative standards;

(b) a failure of arbitration (traditional arbitration or arbitration on-chain via the consensus mechanism);

(c) a limitation period (*eg* if no dispute is raised within 6 months, the contract cannot be reversed in this manner). The passage of time could be monitored by an oracle.

These event triggers would be effective in circumstances where the parties are anonymous because the smart contract is simply running the pre-agreed code and parties do not need to contact each other to resolve the dispute, *eg* to serve notice in a traditional litigation context. However, this remedy would not work for every type of contract, such as when specific performance is warranted.

Reversing

131 A similar remedy, but one requiring the parties to co-operate, is "reversing". Reversing took place following the 2016 DAO hack when a hacker stole 3.6 million ETH (worth $70m at the time).[115] Reversing restored the on-chain activity to the position pre-hack. However, a survey by Vitalik Buterin (Ethereum co-founder) showed reversing to be unpopular (60% responded "no" to reversing). Reversing may be helpful where a chain of transactions is affected by the same issue, *eg* a misstatement in an offer document.

Liability

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[114] Traditional contractual remedies and methods of dispute resolution should also apply to smart contracts as they do to traditional contracts, but these are not addressed in this section.

[115] For the DAO Hack see https://medium.com/swlh/the-story-of-the-dao-its-history-and-consequences-71e6a8a551ee [accessed 31 October 2020].

132 Contractual disputes bring back into focus the question of where liabilities will lie. The technology underlying smart contracts brings additional dimensions of liability. For example, is the developer liable for erroneous source code?[116] Are those participating in the consensus mechanism validating transactions also accountable? As the technology matures and disputes are litigated, market practice will develop to deal with these questions of liability. This may include:

(a) new insurance products to insure against liability;

(b) market standards for excluding liability; and

(c) market standards for security and performance of the network.

6. Conclusion and recommendations

6.1 *Evolution not revolution*

133 Contracting is in a new evolutionary cycle and smart contracts appear to offer a credible method of contracting. Smart contracts enable contract standardisation and automation, a growing trend in various types of contracts from ISDA master agreements to standard conditions of sale (for properties). Smart contracts (and DLT more broadly) also assure the integrity of transaction data and its storage by enabling the secure sharing of data across a network of stakeholders and by maintaining a data audit-trail. Jersey needs to embrace smart contracts to stay competitive in the global market.

134 Since smart contracts are an evolution in contracting, the ordinary rules of contract law, including customary law principles overlaid with ECJL, apply to smart contracts without further statutory intervention, as they do to contracts concluded by email or *via* the internet. Therefore, a legally binding smart contract would need to satisfy all the usual elements necessary for any other contract. Principles of customary law potentially give greater flexibility for the development of law in this area than would the introduction of blockchain-specific legislation, by enabling contract law to develop in parallel with technological developments. Whilst elements of smart contracts are novel (the autonomy and use of code), they should not change the fundamentals of what constitutes a valid contract and the ordinary rules applicable to them.

135 Whilst the subjective approach to contractual consent prevails, the following types of smart contract are capable of constituting smart

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[116] Particularly relevant where the terms depart from human-parsable translations.

legal contracts (assuming the other elements necessary for a binding contract are present):

(a) External smart contracts where human-parsable and computer-readable terms co-exist, but the human-parsable "translation" prevails;

(b) Basic internal smart contracts or those where only peripheral or immaterial elements are inconsistent with human-parsable terms;

(c) Other types of smart contract where immaterial elements are automated or where a full human-parsable translation is provided which will prevail over the code in the event of a conflict.

136 Ultimately, all types of smart contract (internal or external) intended to be legally binding may be capable of creating a valid contract if technology advances and programs develop to enable all smart contracts to be coded using human-parsable code. In the fullness of time, developments in the technology could give smart contracts the ability to satisfy additional formalities, *eg* those reserved for wills.

137 As noted above, smart contracts should be subject to the ordinary rules of contract law, including their inherent inconsistencies. In some respects, smart contracts may be more effective in addressing contractual issues: for example, demonstrating consent using click-through screens; storing immutable evidence regarding acceptance of contractual terms.

138 Ironically, in the public blockchain context, two key mitigants to undue influence stem from anonymity: (i) the anonymity or pseudo-anonymity of counterparties reduces the likelihood of parties identifying each other and inflicting *violence,* duress or undue influence;[117] and (ii) parties may not find each other but are "matched" by an algorithm, *eg* on a cryptocurrency or digital assets exchange.

139 The nascence of DLT (and therefore smart contracts) means that features and safeguarding mechanisms can be introduced to tighten procedural elements of contracting on a blockchain protocol. Governance standards for DAOs, developers, users and blockchain protocols, could reduce the ability of parties to attack the validity of their contractual consent; or digital equivalents of execution requirements and formalities could be embedded. Until regulators and legislatures understand and address the risks and opportunities presented by this technology, the industry will be self-regulating and rely on the good faith of developers and investors.

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[117] That is not to say that a sufficiently well-resourced malfeasant could not exert *violence*. Further, in the private blockchain context these risks remain as parties are likely to be identified.

6.2 Emergence of global standards?

140 Perhaps smart contracts present an opportunity to set international standards for contracting and an international taxonomy. Whilst not specific to contracts but relevant to DLT more broadly, the EU through its fintech action plan[118] and proposed regulation on markets in crypto-assets (MiCA)[119] is promoting standardisation in its internal digital market and streamlining DLT regulation. Jersey should therefore maintain a watching brief on the international developments in this area and at this stage avoid taking any potentially restrictive action beyond a clarificatory statement that smart contracts are capable of fulfilling the criteria for creating a valid contract, and those other actions recommended below. If smart contracts are to service a global market, there will be international pressure for a global solution, with jurisdictional variations, to emerge. Financial and academic investment in smart contracts and DLT should see a standardised approach and settled taxonomy emerge.

141 In the meantime in Jersey, smart contracts remain subject to the ordinary legal or regulatory analysis applied to traditional contracts, securities, property rights or data. Whilst some features of the technology are novel and new asset classes may emerge, as a development or digitisation of traditional products, smart contracts should follow the ordinary approach making allowances for technological advancements.

6.3 *Recommendations*

Statement of recognition

142 Jersey would benefit from issuing a statement of its recognition of smart contracts. Any restatement of contract law should extend to smart contacts to ensure the consistent treatment of smart and traditional contracts. Any restatement should retain the inherent flexibility afforded by customary law to navigate the current uncertainties over (i) technological developments; and (ii) the international treatment of smart contracts.

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[118] European Commission (2018) "FinTech Action plan for a more competitive and innovative European financial sector" https://ec.europa.eu/info/publications/180308-action-plan-fintech_en [accessed 31 October 2020].

[119] European Commission (2020) "Proposal for a Regulation Of The European Parliament And Of The Council on Markets in Crypto-assets, and amending Directive (EU) 2019/1937" [accessed 31 October 2020].

143 It is recommended that any such restatement should:

(a) state that ordinary rules of contract apply to smart contracts and adapt the customary law position to current market needs allowing for technological advances;

(b) state the conditions for valid smart contracts which could include:

(i) the requirement for a human-parsable translation of any code;

(ii) the approach for contractual consent (whether subjective, objective or a mixture);

(iii) a rebuttable presumption that consent given was valid; and

(iv) a link between a rebuttal of that presumption and the usual grounds for defective consent under Jersey law.

144 Similarly, amendments to ECJL could increase uptake in the technology and potentially revolutionise Jersey's domestic affairs by facilitating the adoption of blockchain-based registers.

Engagement of legal profession

145 Currently the legal aspects of smart contracts and related concepts are not widely understood by technologists or lawyers, adding to the perception that there are great risks in contracting by smart contract. Risks include defects in consent (*vices de consentement*) and the misguided electronic agency arrangements. This perception is reinforced by *dicta* from elements of the developer community promoting the technology as "unregulated", and by criminals exploiting anonymity. Perceptions can change with education and collaboration. Perceptions will also change as products from well-regulated financial institutions come to market. The ISDA smart contract project is an example of lawyers, developers and academics working together on a new operating model for smart derivatives contracts which will drive market acceptance in this area.

146 Indeed, there are many features of smart contracts that would benefit Jersey's legal profession and finance industry more broadly (particularly in the private blockchain context) including:

(a) lessening the KYC burden;

(b) increasing transaction speeds and efficiency by automating certain diligence exercises for repeat transactions;

(c) automating performance of certain contractual terms such as payment of fees and interest;

(d) automatically unwinding contracts in certain circumstances; and

(e) assuring data integrity via the immutable audit trail.

147 The Jersey legal profession should engage with smart contracts. The spirit of customary law accepts smart contracts as a viable manner of contracting for the continued benefit and prosperity of Jersey. Long-established legal principles deal with many features of smart contracts which are not novel. The law enabling smart contracts to be recognised should be developed by the courts through custom and usage in the traditional way.

Appendix: Blockchain glossary

Set out below are a collection of definitions and meanings in relation to terms used in the article. Some meanings are not yet settled and the definitions should be treated as clarificatory rather than prescriptive.

Address	Similar to a bank account number where your money is kept, Ethereum or Bitcoin contract addresses are a line of characters or a QR code used to send funds on Ethereum or Bitcoin respectively. The address represents the location where the Ethereum or Bitcoin is stored. It is a hexadecimal notion of the public key.
Algorithm	A sequence of computer code setting rules or giving instructions to a software executer.
Bitcoin	Bitcoin is a digital or virtual currency that uses peer-to-peer technology to facilitate instant payments. See the Bitcoin whitepaper for more details.
Blocks	A block is a computer file that stores transaction data. It records some or all of the most recent transactions that have not yet entered any prior blocks. A block is like a page of a traditional ledger or record book.
Blockchain	Blockchain is distributed ledger technology; it is a decentralised (does not require a central authority) database which can be accessed simultaneously in identical form by participants (nodes) on a network. It is a growing chain of records—each block is a transaction or a set of transactions.
Blockchain ecosystem	The sum of all the parts that make up the blockchain community which interact within and outside the system. It is a term which encompasses: the network of nodes including mining nodes, the ledger, the protocol (and its various layers), the on-chain transactions, the various actors including the developers and various service providers such as exchanges and wallet providers and people providing technical support, the DAO and its members.
Coin	A cryptocurrency or digital cash used as an exchange of value.
Consensus mechanism	The process whereby a mining node solves a computational puzzle set by the system and validate the transaction. "Consensus mechanics" should be construed accordingly.
Cryptocurrency	A digital currency for which encryption techniques are used to regulate the generation of units of currency and verify the transfer of funds, operating independently of a central bank.
Cryptocurrency token or token	A cryptocurrency token is designed to behave like a currency, being a store of value and medium of exchange and referred to in certain jurisdictions as a "payment token".
Cryptocurrency wallet	A device, program, service or other physical medium that sends receives and stores a person's public/private keys for their cryptocurrency. A cryptocurrency wallet is separate from the Blockchain and the actual cryptocurrency is stored on the Blockchain.

Cryptography	The practice of secure communication using mathematical theories and computation to encrypt and decrypt information.
DAOs or decentralised autonomous organisations	A DAO is an organization represented by rules encoded as a computer program that is transparent, controlled by its members and not influenced by a central government.
DAO hack	In June 2016, users exploited the DAO code and stole one-third of the DAO's funds (3.6m ether) to a subsidiary account. All the ether was stored in a single address and was vulnerable to attack. The price of ether dropped from over $20 to under $13. In July 2016, the Ethereum community decided to hard-fork the Ethereum blockchain to restore virtually all funds to the original contract.
DeFi	The NASDAQ market index dedicated to blockchain projects in decentralized finance. The DeFI (or decentralised finance, DEFX) collects market information on blockchain projects.
Distributed	Spread over several devices/computers in different locations.
Distributed ledger technology (DLT)	A digital system for recording transactions in which such transactions and their details are recorded in multiple places at the same time. Unlike traditional databases, distributed ledgers have no central data store or administration functionality.
ERC-20	A technical standard used to issue and implement tokens on the Ethereum blockchain.
ERC-721	A technical standard used to issue non-fungible tokens on the Ethereum blockchain. The tokens are not interchangeable.
Ethereum	Ethereum is an open-source, blockchain-based, decentralised software platform used for its own cryptocurrency, ether. It enables smart contracts and distributed applications (DApps) to be built and run without any downtime, fraud, control, or interference from a third party. For more information about Ethereum see the Ethereum Whitepaper.
Ethereum addresses	See "Address". The Ethereum address is specific to the Ethereum blockchain and addresses are based on the Hexadecimal format (also base16 or hex). They are anonymous, meaning that nobody can know if the address belongs to a known person. Public keys are used to create Ethereum addresses.
Exchange	A marketplace for buying and selling cryptocurrencies, security tokens or digital assets.
External smart contracts	These are smart contracts with terms written in human-parsable languages and prevail over the code where human-parsable and computer-readable terms co-exist, but the human-parsable "translation" prevails.
ICO	Initial coin offering—a method of fundraising for new ventures selling coins to investors.
Internal smart contracts	These are smart contracts with terms where the code either: (i) represents the whole agreement between the parties, superseding human-readable clauses which are considered explanatory; or (ii) represents only part of the contract, and supersedes the clauses

	written in human-legible language.
Ledger	A file recording a collection of transactions.
Mark-up language	A mark-up language is a computer language using tags to define elements within a document. It is human-readable, meaning mark-up files contain standard words in human language, rather than typical programming syntax. While several mark-up languages exist, the two most popular are HTML and XML.
Mining	The process of verifying and ultimately adding transactions to the blockchain ledger, by solving a computational puzzle. This is undertaken by a mining node. The first individual to solve the puzzle is rewarded with a newly minted token/coin.
Network	A number of interconnected devices/computers.
Node	Devices/computers on the blockchain network which maintain the blockchain and sometimes process transactions.
Non-security token	A non-security token can (broadly speaking) be broken into (i) utility tokens; and (ii) cryptocurrency tokens.
Off-chain	Transactions that occur off a blockchain network.
Public blockchain	Open, public blockchains are dubbed "trust-less" because no central authority controls access and participation in the consensus. Participants are incentivised to act honestly by being awarded tokens in the ecosystem. This encourages participants to build a sufficient economic stake and not to attack the protocol.
Oracle	A data source of feed from a trusted third party source used for determining outcomes to smart contracts.
Parsable	*Eg* human-parsable, being the way humans analyse language in terms of grammatical constituents, identifying parts of speech and syntactic relations. This can be contrasted with computer-parsable, *viz*. how a computer analyses language or text.
Participant	A device/computer that can access the blockchain and the data stored on it.
Private keys	Private keys are used to sign blockchain-based transactions to send and receive cryptocurrencies.
Private blockchain	Closed, private permissioned blockchains are used by a limited number of trusted participants.
Public key infrastructure (private-public key pairs)	Keys are generated in pairs: (i) the public key—a formula that is relatively easy to encrypt, but practically impossible to decrypt; and (ii) the private key—used to sign transactions and decrypt the data allowing the user to transfer value.
Reversing	The process of reversing a blockchain ledger to change the state of the ledger, *eg* following a hack, to reinstate the ledger to the pre-hack position. A reverse hard fork is a radical change to the network's protocol and makes all previous blocks and transactions invalid. It requires all nodes and users to upgrade to the latest protocol software.
Security token	A security token would typically have the characteristics associated with an equity or debt security in the traditional capital markets sense.
Smart contract	There is no settled definition of a "smart contract". It is computer code and not a contract *per se* in the legal sense. Smart contracts can automate pre-defined tasks (so called "self-executing") and

	remove the requirement for intermediaries (*eg* paying agents escrow agents). It is a computer program stating if "x" then "y".
Smart legal contract	A smart contract which satisfies the elements necessary to form a valid legal contract.
Source code	Computer code which is a collection of computer instructions and statements for defining how software will function written using a human-readable programming language.
Utility token	A utility token confers on the holder merely a usage right or the right to access a product or service. Such token has no economic rights attached to it and there is no expectation of a return.
White paper	In the blockchain context, the white paper is an authoritative paper that informs readers (targeted at developers and investors) about the terms of blockchain protocol or particular coin or token. In fundraising such as an ICO or STO they are used by blockchain developers to explain their project (*ie* the problem they have identified, the research they have undertaken and the solution that they have designed to resolve it including the description of the product that they have launched, it a digital asset this will be a description of the utility of the token or coin that is being issued) to investors to assist investors in making an investment decision.

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