Law in the Age of Digital Technologies

Edited by Francesca C. Villata, Mirela Župan, Katarina Trimmings, Giulia Gabrielli

Milano University Press

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Foreword

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This volume is the result of scientific research conducted by a consortium of four partner universities – Aberdeen, Milan, Osijek, and the University of Zagreb Computing Centre – within the framework of the *Time to Become Digital in Law* (DIGinLaw) Project. The Project, fully funded by the European Union under the Erasmus+ programme, was carried out from 1 April 2021 to 30 September 2023.

Taking advantage of the pervasive digital transformations that shape every aspect of our society and lives, the DIGinLaw Project aimed to address the digital demands in higher education and legal research by enhancing the creation and development of digital literacy and competencies that are greatly needed in the legal labour market. The Project aspired to create an open and inclusive society of digital legal knowledge and literacy to benefit lecturers, students, academics, and stakeholders in the legal labour market. To achieve this ambitious goal, the team members participating in the consortium committed themselves to providing high-quality training on digital competencies to students from partner universities and ensuring open access to the results of their joint scientific research on the effects of digitalization on law and legal education.

As part of these efforts, fostered through the continued collaboration and exchange among partners, this volume retraces the scientific research conducted during the Project on the overall theme of the impact of digitalization on law and legal education. It provides opportunities for further discussions on related cross-cutting themes. To do so, it gathers contributions from scholars and researchers from universities worldwide who are experts in various fields within the broader area of legal research.

The pervasiveness and ubiquity of digital technologies and the advent of information society entail multiple transformations and social changes. As digital technologies continue to evolve and permeate countless aspects of social interactions, work relations, political participation, and business and financial transactions, the need to discuss their private, public, cross-border, and international implications becomes urgent. The transformations fostered by digitalization generate new needs, interests, and conflicts that require harmonization and regulation to improve their economic and societal benefits and, most importantly,

limit the risks and negative consequences they might entail for individuals and society at large.

Among the topics addressed in the volume, new legal realities such as collaborative economic platforms, crowdworking, and banking and financial digital platforms raise significant questions about the need for increased transparency, consumer protection, and the protection of human rights. Regarding the new technologies discussed by the featured contributions, Artificial Intelligence (AI)-based systems present some of the most complex legal issues. Facial recognition technologies, automation, eHealth services, and machine-learning each raise specific questions regarding the protection of human rights and fundamental freedoms, especially privacy and personal data, as well as other legal issues such as civil liability and system security. Similarly, transfers in Distributed Ledger Technologies (DLT) are challenging the existing legal framework and introducing new legal phenomena such as smart contracts, prompting wider research and discussions on their regulation, legislation, and the demand for guidance.

The volume acknowledges the need for additional clarity in response to these digital transformations and offers a perspective on a variety of substantive and procedural legal issues. Part 1 focuses on the conduct of states in the so-called cyberspace and touches upon a few selected legal considerations, noting the technical difficulties in applying the existing international legal framework to states' cyber activities, both during peacetime and in times of armed conflict. Part 2 of the volume shifts to the private sphere of digitalization and covers four distinct fields of study. Section 1 addresses cross-border financial transactions, discussing topics such as automation, electronic evidence, and digital platforms from a private international law and European perspective. Section 2 focusses on specific issues arising from digitalization relating to personal rights and family matters, including cross-border eHealth, the circulation of public documents, and the regulation of digital services in light of the protection of human rights and fundamental freedoms. Section 3 explores criminal matters and discusses the integration of AI into criminal proceedings from the perspectives of the right of defense and procedural fairness. Section 4 revisits one of the project's objectives; namely, the impact of digitalization on legal training, and discusses a practical case.

Having outlined the structure of this volume, its rationale, and the objectives of the Project from which the research originated, the editors wish to express their sincere gratitude to the European Commission for the financial support that made the Project possible. Special thanks also go to each team member of the participating universities in the consortium: Josip Juraj Strossmayer University of Osijek (Croatia), University of Milan (Italy), University of Aberdeen (United Kingdom), and the University of Zagreb Computing Centre (Croatia). Lastly, the editors wish to extend their heartfelt gratitude to the

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January 2025

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Smart (Legal) Contracts: New Challenge For North Macedonian Legal System

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The future is already here - it's just not very evenly distributed.
William Gibson, 1993

Abstract

The global reality of the Fourth Industrial Revolution is evidenced by the adoption of Big Data analytics, Cloud Computing, Blockchain (cryptocurrencies, smart contracts, etc.), and the Internet of Things (smart buildings, artificial neural networks, machine learning, smart cities, etc.) which are becoming integrated into national legislation. As a result, countries must prioritize digitalization to keep pace with Industry 4.0. Smart legal contracts, which serve as a bridge between law and digitalization, are relatively new and challenging development for national legal systems. Although only a few countries have legally regulated smart legal contracts, all national legal systems will inevitably follow suit. This article aims to assess the North Macedonian legal system's existing legislation and determine the optimal approach to integrating smart contracts. Should a new, special law (*lex specialis*) be enacted, or should provisions for smart legal contracts be added to the existing legal framework? The EU's legal tendencies should also be considered to ensure North Macedonian law is harmonized with European Law. The structure of the article unfolds as follows: Introduction; The concept and main characteristics of smart legal contracts, Smart legal contracts concerning the North Macedonian Law on Obligations; Smart legal contracts concerning the North Macedonian Law on electronic commerce; New Law on smart legal contracts or amending the existing legislation in North Macedonia?, and Conclusion remarks. To achieve its goals, this article will employ several research methods, including normative analysis, descriptive and legal research, and applied legal research, comparison, analogy, and case law analyses.

Keywords
Smart Legal Contracts, Traditional Contracts, Digitalization

1. Introduction

The emergence of digital technology has brought about significant changes in contract laws, with the impact of the Internet being one of the most apparent examples. Currently, smart contracts are topic *de jour* in the technology, offering the potential to transform the traditional contracts. Szabo defines smart contracts as a 'set of promises, specified in digital form, including protocols within which the parties perform on these promises'.[1] Surde envisioned that parties will have the ability to convert specific requirements into a set of computer-readable rules, as well as certain manual comparison between the terms of the contract and the parties' actual activity could be automated. He points out that this automation could substantially decrees the transaction costs.[2]

Proponents assert that smart contracts will obviate the need for contract law, revolutionize business arrangements, and restructure property ownership.[3] Conversely, skeptics view the blockchain foundation a mere Ponzi scheme.[4] Some technologists argue that, despite their name, smart contracts have nothing to do with contracts[5] and some scholar notes that smart contracts are not really 'smart' because they cannot (or at least not yet) think or develop, and are not a form of Artificial Intelligence (AI).[6] Legal futurists tend to present the reduction of legal obligations with the computer code as a positive evolutionary step toward the realization of the rule of law.[7]

Although the impact of the smart contracts on the world is uncertain, they offer tangible advantages and are expected to be widely adopted in the future. The aim of this article is to provide a small contribution towards the integration of modern technologies within the legal field. Instead of hindering the efficient implementation of the advantages of rapid technological advancement, the law should serve as a corrective measure and encouragement. It is crucial to maintain a harmonious relationship between law and technology to effectively

1 Nick Szabo, *Smart Contracts: Building Blocks for Digital Markets* (1996) 1 <www.truevaluemetrics.org/DBpdfs/BlockChain/Nick-Szabo-Smart-Contracts-Building-Blocks-for-Digital-Markets-1996-14591.pdf> accessed 30 May 2024.

2 Harry Surden, 'Computable Contracts' (2012) 46 University of California Davis 629.

3 Kevin Werbach and Nicolas Cornell, 'Contracts Ex Machina' (2017) 67 Duke Journal of Law 313, 317.

4 ibid.

5 ibid.

6 Maartje Herweijer, 'Blockchain and the law – Regulation for smart contracts on the way?' (*Stibbe*, 2019) <https://www.stibbe.com/> accessed 30 May 2024.

7 Frank Pasquale, 'A Rule of Persons, Not Machines: The Limits of Legal Automation' (2019) 87 The George Washington Law Review 1, 4.

utilize all innovations available to the citizens. In this regard, the protection of human rights and freedoms, as well as the rule of law must remain the imperative. While acknowledging the prevailing view among the legal theorist that smart contracts system will not replace the traditional one, this article advocates for the incorporation and regulation of smart contracts in national legislations, alongside the traditional contracts. This will be able the law to govern and facilitate the growth of smart contract technology. Therefore, the intention of the article is to encourage the acceptance of smart contracts in national and international legislations, including North Macedonian legislation.

2. The concept and main characheristics of smart (legal) contracts

The concept of smart contracts emerged in the legal field only a short time ago, but it has already sparked vastly divergent viewpoints. Accordingly, legal scholars do not share a unanimous opinion concerning the definition of smart (legal) contracts.

Thomas Kulnigg defines legal smart contracts, as the underlying program code that itself qualifies as a legal contract.[8]

Mark Verstraete considers that blockchain-based smart contracts are self-enforcing agreements that ensure performance through technological authority rather than sovereign authority.[9] Actually, in its article, Verstraete offers a new critique of the optimism about smart contracts and the preference for securing mutual agreements using code, rather than traditional contract law. He challenges the idea that smart contracts can entirely replace traditional contract law. Verstrate point out that unlike previous technology-infused contracts, which relay on a legal system for enforcement, smart contracts aim to be self-executing and autonomous, bypassing or at least being independent of the State's contract law machinery. According to him, this represents a significant departure from earlier attempts to automate contract law trough emerging technologies.[10] Verstrate argues that in a contract system, parties do not require complete trust in each other; rather they rely on trust in the legal system. The foundation of contract law is based on a shared understanding that the legal system will provide a remedy, typically exception damages, if a breach occurs. The crucial difference between the smart contracts and traditional contracts lies in this aspect. Smart contracts, along with other blockchain and internet projects, eliminate

8 Thomas Kulnigg, 'Smart contracts: Too smart for Austrian civil law?' (*Schönherr*, 2018) <www.schoenherr.eu/content/smart-contracts-too-smart-for-austrian-civil-law> accessed 30 May 2024.

9 Mark Verstraete, 'The Stake of Smart Contracts' (2020) 50 Loyola University Chicago Law Journal 743, 762.

10 ibid 753.

the need for centralized intermediaries. Technologists aim to automate contract law by replacing the legal system with code-based enforcement mechanisms. As a result, smart contract may enable parties to form and enforce the agreements without relying on the state. However, this perspective rests on certain contested assumptions about the role of the state in contract law.[11]

By Maartje Herweijer, smart contracts are computer protocols that execute pre-determined rules of code: the contractual terms are embedded in software, generally on a blockchain (although smart contracts do not necessarily have to be blockchain-based). Smart contracts cannot be altered retroactively, and will automatically execute or effectuate legal agreements (ie without the cooperation or intervention of the contracting parties or a third party) once they are recorded on a blockchain.[12]

Woebbeking considers that, in a technical sense, smart contracts can be defined as computer protocols that are self-executing. Relying on the abilities of blockchains, they operate autonomously, transparently, and they are basically tamper-resistant and immutable.[13]

De Sevres and others note that a smart contract is created by encoding the terms of a traditional contract and uploading the smart contract to the blockchain. Contractual clauses are automatically executed when pre-programmed conditions are satisfied.[14] Very intriguing view shares Fairfield who defines smart contracts, as automated programs that transfer digital assets within the block-chain upon certain triggering conditions and represent a new and interesting form of organizing contractual activity. In this regard, he points out that if financial transactions can be freed of banks as intermediaries, then contracts can be freed of courts as intermediaries. Finally, he concludes that this will solve a longstanding puzzle and problem of e-commerce: courts' longstanding refusal to enforce contract terms proffered by consumers, ending with the statement that 'if courts will not protect consumers, robots will'.[15]

Szczerbowski alerts that two elements of contract law call for attention, regarding the smart contracts: form of contract and contract interpretation. Considering the first element, he contemplates that currently, smart contracts fall into the category of documentary form, which encompasses plain text,

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11 ibid 754.

12 Herweijer (n 6).

13 Maren K Woebbeking, 'The Impact of Smart Contracts on Traditional Concepts of Contract Law' (2019) 10 Journal of Intellectual Property, Information Technology and Electronic Commerce Law, 106, 107.

14 Hossein Kakavand, Nicolette Kost De Sevres, Bart Chilton, 'The Blockchain Revolution: An Analysis of Regulation and Technology Related to Distributed Ledger Technologies' (2017) <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2849251> accessed 7 July 2024.

15 Joshua A T Fairfield, 'Smart Contracts, Bitcoin Bots, and Consumer Protection' (2014) 71(2) Washington and Lee Law Review Online 36 <https://scholarlycommons.law.wlu.edu/wlulr-online/vol71/iss2/3> accessed 30 May 2024, 38–39.

emails and text messages (SMS), undervaluing the security provided by blockchain technology. Because of this high level of certainty, usually reserved to written form and electronic form he proposes an addition to the civil law system: blockchain form. Addition of this particular form would enable setting proper presumptions which reflect the secure nature of blockchain transactions – switching the burden of proof to the one who denies the veracity of blockchain, not the one who asserts. Pertaining to the second element, Szczerbowski assesses that interpretation of smart contracts requires a subtler approach as it should depend on the subjective qualities of the parties. For that reason, concludes that it will be most rational to allow courts to establish guidelines for interpreting smart contracts.[16]

In its White Paper, the Chamber of Digital Commerce offers two distinct definitions for smart contracts and smart legal contracts. Accordingly, smart contract are 'computer code that, upon the occurrence of a specified condition or conditions, is capable of running automatically according to pre-specified functions. The code can be stored and processed on a distributed ledger and would write any resulting change into the distributed ledger'.

On the other hand, smart legal contract are 'smart contract that articulates and is capable of self-executing, on a legally-enforceable basis, the terms of an agreement between two or more parties'.[17]

Based on the definitions and perspectives presented above, it could be inferred that there are two methods for defining smart contracts, which are technical and legal approaches. Therefore it is important to note that not all smart contracts meet the criteria to be classified as legal contracts. As a result, smart contracts refer to contracts that have the capacity to be legally binding and are subject to legal regulations. This article defines smart legal contracts as digital contracts that are self-executed on decentralized blockchain networks, and are legally-enforceable while being automatically fulfilled when predetermined conditions are met.

While various interpretations of the term smart contract exist, there is currently no universally recognized, standardized definition of this term within the legal systems. However, certain legislations have begun incorporating smart contracts into their national laws and regulations, despite the luck of universal definition.

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16 Jakub J Szczerbowski, 'Place of Smart Contracts in Civil Law. A Few Comments on Form and Interpretation' (2017) Proceedings of the 12th Annual International Scientific Conference NEW TRENDS 2017 <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3095933> accessed 30 May 2024, 337.

17 Chamber of Digital Commerce, 'Smart Contracts: Is the Law Ready?' (Smart Contracts Alliance, 2018) <https://lowellmilkeninstitute.law.ucla.edu/wp-content/uploads/2018/08/Smart-Contracts-Whitepaper.pdf>accessed 30 May 2024, 12.

In its Virtual Financial Assets Act the Republic of Malta has adopted the following definition: 'smart contract means a form of technology arrangement consisting of (a) a computer protocol; or (b) an agreement concluded wholly or partly in an electronic form, which is automatable and enforceable by computer code, although some parts may require human input and control and which may be also enforceable by ordinary legal methods or by a mixture of both'.[18]

The Republic of Italy also recognizes the legal value of smart contracts. Under the Law No. 12/2019 smart contracts are defined as 'computer program that works on technologies based on distributed ledgers and which performance automatically binds two or more parties on the basis of the effects previously defined by the parties themselves. Smart contracts fulfill the written form requirement upon prior electronic identification by the parties at hand, through a process the requirements of which are set by the Agency for Digital Italy with guidelines to be adopted within ninety days from the effective date of the entry into force of the decree hereto.'[19]

Law on Digital Assets of Republic of Serbia also introduces the term smart contracts: '"smart contract means a computer program or a computerized protocol based on the distributed ledger technology (DLT) or similar technologies, which is partly or wholly performed by software and which automatically executes, controls or documents legally relevant events and actions according to the terms of a contract already concluded, whereby the contract may be concluded electronically by such program or protocol'.[20]

Additionally, in art 37 it is stated that the use of smart contracts in secondary trading in digital assets is allowed and if a digital asset service provider provides services which involve the use of smart contracts, it shall obtain the consent of the digital asset user for the use of smart contracts.

The EU Data Act Proposal accepts the definition as follows: 'smart contract means a computer program stored in an electronic ledger system wherein the outcome of the execution of the program is recorded on the electronic ledger'.[21]

Drawing from the definitions mentioned earlier, I can identify the key characteristics that define the smart contracts, which include their ability to self-enforce and operate autonomously, their reliance on software, their conditional structure, and their electronic format.

Self-enforceability is one of the key feathers of smart contracts. A smart contract is a computer program that automatically executes the terms of an

18 Act No XXX of 2018 (ATT Nru XXX 2018) (MT), (2) (2).

19 Italian Decree Law No. 12/2019, art 8-ter <https://www.normattiva.it/uri-res/N2Ls?urn:nir:stato:decreto.legge:2018-12-14;135!vig>.

20 Law on Digital Assets (Zakon o digitalnoj imovini 2020) (RS), 2 (1) (39).

21 Proposal for a Regulation of the European Parliament and of the Council on harmonized rules on fair access to and use of data (Data Act), COM(2022) 68 final, 2022/0047 (COD), 2022, Brussels, art 2.

agreement between two or more parties. Once smart contract is concluded, its further execution is no longer dependent on the will of its parties or third party, neither it requires any additional approvals or actions from their side. Computer verifies all the conditions, transfers assets and makes entries in the Blockchain database about such transfers.[22] Papantoniu argues that the benefits of smart contracts, including their automaticity and self-enforcement, have been recognized as a way to expand the potential of certain commercial transactions.[23] Additionally, Savelyev notes that smart contracts can function independently without any requirement for a legal system to support them, rendering their existence separate from a broader legal framework. Essentially, smart contracts represent a technological alternative to the whole legal system.[24]

Smart contracts are essentially software program that run on a blockchain platform.[25] Savelyev notes that code is law, and in smart contracts computer code is also contractual terms. Thus, contractual terms are manifested in a computer code, what is not generally prohibited based on the "freedom of contract" principle. He argues that each smart contract by its legal nature is also a computer program in a meaning of IP law. Thus, s*mart contract has dual nature in the law: it serves as a "document" governing contractual relations of the parties and it is also object of the IP rights*, representing the valuable object of intellectual activity.[26] Pasquale explains that while computer code and human language both enable forms of communication, the affordances offered by each are distinct and, in many respects, mutually exclusive. He points out that code seeks to eliminate the forms of ambiguity and flexibility characteristic of much language, including legal language. Just as quests to replace all standards with rules have failed, so too will most efforts to rewrite legal rules as code.[27]

Smart contracts include conditions or rules that need to be met for the contract to be executed. Conditions are typically written into the code of the contracts and can include triggers such as the completion of certain actions or the meeting of specific requirements. The computer code is based on statements like 'if "x" then "y"'.[28] Raskin states that performance and enforcement of

22 Alexander Savelyev, 'Contract law 2.0: "Smart" contracts as the beginning of the end of classic contract law' (2017) 26(2) Information & Communications Technology Law 116, 126.

23 Alexandros A Papantoniou, 'Smart contracts in the new era of contract law' (2020) 1(4) Digital Law Journal 8, 23.

24 Savelyev (n 22) 132.

25 There are various platforms for smart contracts: Ethereum, Hyperledger Fabric, NEM, STELLAR, Waves, and Corda. For more details about their advantages and disadvantages, see: Hamed Taherdoost, 'Smart Contracts in Blockchain Technology: A Critical Review' (2023) 14 Information, 117, 8.

26 Savelyev (n 22) 124.

27 Pasquale (n 7) 3.

28 Savelyev (n 22) 126.

a smart contract essentially boils down to conditional statements, which are foundational to computing.[29]

Smart contracts are created and executed using digital platforms and software, making them electronic in nature. They are written in programming languages and stored on a blockchain, which is a decentralized and distributed digital ledger technology. Sovelyev explains that classic contracts may exist in various forms, e.g. in oral form or in writing and in contrast to that, smart contracts may exist only in electronic form, it is not possible to use any other form of the contract to them (e.g. oral or written hardcopy). He emphasizes that smart contract is limited to the digital world, so only electronic goods/services (exchange of digital goods, transfer of money, etc.) can be the subject of a smart contract.[30]

3. Smart (legal) contracts in North Macedonian law

In the Republic of North Macedonia, smart contracts currently lack legal recognition as binding instruments, and there is no dedicated legislation in place for their use. Therefore the primary objective in this part of the article is to ascertain whether smart contracts can be covered under the Law on Obligation,[31] as *lex generalis*, or if there is a need to supplement it. Additionally, an examination will be conduct on the provisions of the Law on Electronic Commerce,[32] as *lex specials* with respect to smart contracts. This analysis will also focus on whether the provisions of this law could extend to smart contracts.

3.1. Smart legal contracts concerning the Law on Obligations

The fundamental concept behind the North Macedonian law regarding contracts is the principle of freedom to regulate obligations. According to art 3 of the Law on Obligations, participants involved in trade have the liberty to regulate the obligations in accordance with the Constitution, the laws, and the good customs. In North Macedonian law, the essential elements of a contract include the mutual assent, the subject of the contract, the legal basis of the contract, the capacity of the contracting parties, and the form of the contract.

29 Max Raskin, 'The Law and Legality of Smart Contracts' (2017) 1 Georgetown Law Technology Review 304, 312.

30 Savelyev (n 22) 124.

31 Law on Obligations (Закон за облигационите односи 2001) (NMK).

32 Law on Electronic Commerce (Закон за електронска трговија 2007) (NMK).

Table 1. Essential elements of a contract under the Law on Obligations

Mutual assent
Subject of the contract
Legal basis
Capacity of the contracting parties
Form of the contract

Source: Law on Obligations

With regarding the first element, as per Law on Obligations, the contract is deemed to be concluded as soon as the parties involved have agreed on the essential elements of the contract.[33]

The assent to enter into a contract may be expressed by words, with the usual signs or other conduct that indicates its existence. Additionally, various modes of communication, such as telephone, fax, internet, and others, can also be used to convey the intention to form a contract. It is essential that the statement of assent be made freely and in a serious manner.[34] According to art 23, a contract is established once the offeree communicates his acceptance of the offer to the offeror. The offer, which should include all the essential terms of the contract, can be directed to either a present or absent party. [35] As per Law on Obligations, an offer can also be extended through various modes of communications, which is then regarded as an offer between absent parties.[36] Acceptance of the offer is deemed to have occurred at the point when the offeror receives a notice from the offeree confirming his acceptance of the offer.[37]

As the second essential element pertaining to the subject of the contract, the Law on Obligations specifies that the contractual obligation can involve giving, doing, not doing and enduring and that such an obligation must be possible, permitted, and specific or determinable.[38] If the subject of the contract is unlawful, undetermined or undeterminable, the contract is rendered nullified.[39]

As stated in art 43 of the Law on Obligation, each contractual obligation must be founded on a legal basis. The basis is considered legal if it is aligns with the Constitution, laws, and good customs and it is presumed that an obligation has a legal basis even it is not explicitly stated. If the basis does not exist or is not permitted, the contract is nullified.[40]

33 art 18 of the Law on Obligations.
34 art 20 of the Law on Obligations.
35 art 24 of the Law on Obligations.
36 art 24-a of the Law on Obligations.
37 art 31 of the Law on Obligations.
38 art 38 of the Law on Obligations.
39 art 39 of the Law on Obligations.
40 art 44 of the Law on Obligations.

The Law on Obligations explicitly requires that the contracting parties must have both legal and business capacity to be eligible for holding rights and responsibilities in a valid contract.

The Law on Obligation specifies that the contract can be established in any form, unless there are legal requirements determining a particular form.[41]

Regarding the first essential element of a contract established by the Law on Obligations, I consider that the smart contracts can be recognized as legally enforceable in North Macedonian legislation. This is because the assent to enter into a contract may be expressed by words, with the usual signs or other conduct that indicates its existence. Therefore, it can be inferred that the assent may also be indicated through distributed ledger systems. Expressing assent is significant in this context to be made freely and in a serious manner. In this regard, Werbach and Cornell consider that if a party enters into a smart contract due to fraud or duress, in such a situation, performance may be excused, so the smart contract itself would be valid, but it would be simply not legally enforceable.[42] Accordingly, creating a smart contract on a distributed ledger and singing it by private key, constitutes a legitimate offer and acceptance under North Macedonian Law on Obligations.

In terms of the second essential element, I also consider that the Law on Obligations encompasses smart contracts. If the legal prerequisite, which is that the subject of the contract must be possible, permitted, and specific or determinable, is not fulfilled, specific issues may arise, especially considering the self-executing nature of smart contracts. In this case, according to the Law, the concluded smart contract will be deemed null and void.

As for the third element, which is the legal basis I believe that it is not applicable to smart contracts. Due to the specific characteristics of smart contracts, I suggest that they should be explicitly introduced by the Law on Obligation.

I am of the opinion that the fourth essential element of contracts may also encompass smart contracts. In terms of applying the forth element to smart contracts, an issue may arise regarding the pseudo-anonymity, where the involved parties may not have information about the other party they are contracting with. In this regard, the Chamber of Digital Commerce considers that the pseudo-anonymity feature in public blockchains can be changed by the design of the blockchain and replaced with identification requirements.[43]

Concerning the final essential element, this is the form of the contract, I also believe that it is applicable to smart contracts. The phrase 'in any form' encompasses the digital, blockchain, or documentary forms of smart contracts. The Law on Obligations also specifies that the form can be predetermined for specific contracts. If the form of smart contracts is not recognized as a

41 art 59 of the Law on Obligations.

42 Werbach and Cornell (n 3) 369.

43 Chamber of Digital Commerce (n 17) 21.

permissible form, contract with a legally established form cannot be executed as smart contracts.

3.2. Smart legal contracts concerning the Law on Electronic Commerce

A contract that can be completed, transmitted, received, terminated, canceled, accessed, and displayed electronically using electronic, optical, or similar means, including but not limited to Internet transmission, is referred to as an electronic contract under the Law on Electronic Commerce. This contract can be entered into by legal or natural persons either entirely or partly through electronic means.[44]

The contract's form and validity in electronic form are defined in art 10, which permits the contract to be concluded and offer and acceptance to be made electronically. The use of electronic means to make the contract will not render its validity contestable, even if the entire process was concluded through electronic message. Additionally, if the contract requires a person's signature for validity and conclusion, an electronic signature conforming to the electronic signature regulations on an electronic message will fulfill that requirement.[45] The Law on electronic commerce clearly outlines the types of contracts that cannot be concluded in electronic form, which including the following contracts:

a. Those falling under the purview of family and inheritance laws;
b. Those involving the creation or transfer of real estate rights (with the exception of lease right);
c. Those that require the involvement of courts, notaries, or similar professions as mandated by law, and
d. Those entered into by individuals for purposes outside their trade, work, or professional engagement, which require a guarantee or additional security.

Art 11 stipulates that, in the absence of any specific provisions in the Law on Electronic Commerce contractual legal relationships resulting from or connected to electronically concluded contracts shall be governed by the Law on Obligations in a subsidiary capacity. According to the Law on Electronic Commerce, an electronic contract is deemed to be concluded when the offeree acknowledges acceptance of a contract's terms through an electronic message. The offer and the acceptance are considered to be received when they are accessible to the parties for whom they are intended. [46]

Given the aforementioned provisions of the Law on Electronic Commerce, I am on the opinion that they are not applicable to smart contracts. Smart contracts differ from the smart contracts in both material and formal aspects.

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44 art 3 para 1 point 8 of the Law on Electronic Commerce.
45 art 10 paras 1, 2, 3, 4 of the Law on Electronic Commerce.
46 art 14 of the Law on Electronic Commerce.

Therefore I think this Law should solely pertain to contracts in electronic form and should not be augmented with provisions relating to smart contracts.

3.3. New Law on smart legal contracts

Smart contracts are probably not 'the mature end of the evolution of electronic agreements', notwithstanding, they represent a new era of contracting. As seen above, the existing contract law can stand up to some of the challenges posed by smart contracts.[47]

As emphasized in the introduction of the article, I consider that national legal systems should govern smart contracts for two reasons: firstly, smart contracts are a factual occurrence in the digital realm, and their existence should not be disregarded by law. Secondly, it is essential to safeguard the rights and freedoms of citizens and, at the same time, streamline their day-to-day operations. For instance, if smart contracts are not legally governed, and the individual enters into a smart contract despite that, his rights and obligations will be unprotected.

In the light of this, I am of the opinion that the most appropriate approach to incorporating smart contracts into North Macedonian law is by enacting a special Law. The Law should comprise provisions for the legal interpretation of smart contracts; define their scope of application, and explicitly state situations in which smart contracts cannot be applied.

The enactment of the specialized Law for governing smart contracts in the Republic of North Macedonia is essential and should be carried out expeditiously, in line with the obligations for the digitalization of society, as delineated in the National ICT Strategy.[48]

4. Conclusion remarks

Smart contracts offer an opportunity for a novel reinvestigation of contract law, by explicating the reasoning behind contract law rules and by elucidating the precise structure of contract rules by way of formalization in pseudo code.[49]

However, most of the literature concludes that traditional contract law will continue to apply in a smart contract era, and that "smart contracts will never fully replace natural-language law; Nonetheless, many authors also predict that

47 Woebbeking (n 13) 112.

48 National ICT Strategy of the Republic of North Macedonia 2023–2027, <https://shorturl.at/A4OAD> accessed 30 May 2024.

49 Eric Tjong Tjin Tai, 'Formalizing Contract Law for Smart Contracts' (2017) Tilburg Private Law Working Paper Series 6/2017, 8 <https://ssrn.com/abstract=3038800> accessed 30 May 2024.

smart contracts can bring clarity, predictability, auditability, and ease of enforcement to contractual relations. [50]

In my opinion, it is necessary to regulate smart contracts through legal norms, due to the many benefits they offer: increased speed, efficiency, cost effectiveness, highly secure, greater accuracy, clear communication, paper free and so on.[51] This does not imply that 'the law will become the subdivision of commuter science'.[52]

The main goal of the article was to assess the North Macedonian legal system's existing legislation and determine the optimal approach to integrating smart contracts. So, as previously stated in the context of North Macedonian Law, I consider that the following steps should be taken: firstly, the Law on Obligation should be amended to include smart contracts as a distinct type of contract, and secondly a special Law should be enacted to define and regulate all relevant details and specificities related to smart contracts.

I strongly believe that smart contracts as created by technology, will not be the 'problem' for the law.

50 J Dax Hansen, Laurie Rosini, Carla RReyes, 'More Legal Aspects of Smart Contract Applications' (2018) White paper, Perkins Coie 1, 6, <https://www.perkinscoie.com/images/content/1/9/v3/199672/2018-More-Legal-Aspects-of-Smart-Contract-Applications-White-Pa.pdf> accessed 07 July 2024.

51 Pete Peranzo, 'Smart Contracts in Real Estate: Benefits, Use Cases, and Examples' (*Imaginovation*, 2023) <https://imaginovation.net/blog/smart-contracts-in-real-estate/> accessed 30 May 2024.

52 Pasquale (n 7) 2.