

Tihomir Krstić,*
Attorney-at-law,
Krstić Law Office, Niš,
Republic of Serbia

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THE UN CONVENTION ON CONTRACTS FOR THE INTERNATIONAL SALE OF GOODS (CISG) IN THE CONTEXT OF DIGITALIZATION

Abstract: *The article examines whether and how the 1980 UN Convention on Contracts for the International Sale of Goods (CISG) remains fit for purpose in an economy reshaped by digitalization. The paper maps the core CISG institutes, particularly the scope and formation (Articles 1, 14–24), parties' rights and duties, and final provisions, in light of contemporary practices such as: electronic contracting, platform-based commerce, and smart-contract workflows. Particular attention is given to electronic communications and signatures (Articles 8, 11, 13), notices (Articles 22, 27), and the evidentiary use of digital records, highlighting practical issues of authenticity, integrity, and burden of proof. The paper also addresses jurisdiction and choice-of-law questions arising from cross-border digital sales, including the interaction of Article 1(1)(a) and (b) with party autonomy and forum selection. In comparative perspective, the analysis situates the CISG alongside the UNCITRAL Model Law framework, the UNIDROIT Principles, and EU initiatives on digital content, showing areas of convergence and persistent gaps. Looking forward, the author assesses the implications of AI-enabled contract management and blockchain-based transaction logs, noting where property/title effects remain governed by domestic law. The article concludes that the CISG's technology-neutral rules continue to provide a robust baseline for international sales, but effective use in fully digital environments requires careful contract drafting, explicit communications protocols, agreed custodianship of electronic evidence, and complementary reference to soft-law instruments and regional measures.*

* adv.tihomirkrstic@gmail.com, ORCID ID: 0009-0003-4224-7511.

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1. Introduction

Digital technologies have fundamentally transformed the operation of international trade, altering supply chains and reshaping contract practices. As this landscape continues to evolve, it becomes essential for contract managers, in-house counsels, legal advisers, policymakers, negotiators, and academics to maintain an up-to-date understanding of how the United Nations Convention on Contracts for the International Sale of Goods (CISG, 1980)¹ applies within this increasingly digitalized context. This article is devoted to addressing the critical need for guidance and insight. The framework provided will focus on several key areas: contract formation, contract validity, contract enforcement, and jurisdictional issues that arise in the digitalized environment. In this modern landscape, digitally concluded contracts emerge as a valid and binding basis for international trade; however, the CISG leaves many pertinent and conspicuously unanswered questions regarding their applicability, limitations, and the potential need for supplementary rules (Perales, 2023: 293).

Within the CISG, the coverage of contract formation is addressed in considerable detail, confirming that contracts can be validly concluded through offers and acceptances that are exchanged via various means, such as fax, email, telegraph, telex, or other similar modes of communication. Conversely, it is notable that the CISG lacks specific provisions that address contracts concluded via newer platforms, such as chat rooms, interactive websites, or the innovative smart contracts embedded within blockchains. The discussion around these topics extends further to encompass the roles of electronic notices and digital signatures, providing clarity on how many other instruments can be seen as compliant with the concepts of “writing” and “signature” as defined under the CISG. The established (“digitalized”) rules governing offer and acceptance under the CISG critically determine the legal status of contracts that are concluded digitally through the aforesaid communication methods, while simultaneously acknowledging that the law of the forum may impose additional contractual requirements for certain types of contracts (Jovanović, 2025:173).

¹ United Nations Convention on Contracts for the International Sale of Goods (CISG), Vienna, 1980, adopted on 11 April 1980, entered into force on 1 January 1988; https://cisg-online.org/media/Q46291BS/CISG_english.pdf

In light of this, it is imperative to assess the legal effect of digital evidence thoroughly to avoid any delays and limitations that might obstruct the successful conclusion of specific types of contracts electronically. The CISG indeed provides valuable rules pertaining to the law applicable to digital sales contracts and the disputes that might arise from them. However, it is important to note that the law applicable to non-contractual obligations resulting from sales remains somewhat undetermined; this area is often governed by the law applicable to ordinary sales rather than the more specific law that governs sales contracts. An overview of the historical development of international sales law offers clarity in understanding the foundational elements that illustrate the gradual efforts aimed at unifying these laws across jurisdictions. The continuous digitalization of international sales contract formation and the reliability of statements within this domain highlight the crucial role played by the CISG in the digital context we currently inhabit (Lookofsky, 2022: 296).

Furthermore, the evolution of the international sales law framework, which is evident in the developments within UNCITRAL Model Laws and the European Directive, serves to complement the CISG provisions. By acknowledging these advancements and the challenges posed by the digital environment, stakeholders can better navigate the complexities of international commerce and ensure that contracts remain enforceable and effective in the face of technological change (Winer, 1998: 1; Eiselen, 2017: 48).

2. Historical Background of the CISG

International trade is rapidly evolving due to the advancement of digital technology. Hence, the question arises whether the 1980 UN Convention on Contracts for the International Sale of Goods (CISG), regulating formation and performance of contracts of sale, provides an adequate regulatory framework for sale of goods in the digital age (Winer, 1998: 1-58). To assist the CISG application in response to technological innovation, the article comprehensively reviews the development of the CISG in an already digitalized background.

The origins of the CISG date back to the 1960, when the peace mission of the United Nations was expanded to the field of international economic development (Visser, 1998: 2-3). After that, the Seventh UN Conference on the Law of Treaties adopted the Vienna Convention of 1969, which was followed by the adoption of the New York Convention in 1970. Subsequently, the United Nations General Assembly adopted a series of resolutions to promote simplification and modernization of international trade law. After consideration of model laws, it was concluded that a more permanent project could be launched to harmonize the basic law of sales contracts on a global scale.

3. Key Provisions of the CISG

The CISG comprises 101 articles divided into four parts: scope of application (Arts. 1–6), formation of the contract (Arts. 14–24), sale of goods (Arts. 25–88), and final provisions (Arts. 89–101) (Schroeter, 2008: 425). Provisions governing formation and the sale of goods apply only between parties whose places of business are in contracting states (Art. 1(1)(a)) or when the rules of private international law lead to the application of a contracting state's law (Art. 1(1)(b)). Final provisions address questions of public international law and technical issues resulting from ratification.

4. Impact of Digitalization on International Trade

International trade has witnessed substantial transformations resulting from the ongoing digitalization process, particularly since the widespread and now nearly universal usage of the Internet across the globe. It has become a commonplace for various types of contracts, including sales agreements and service contracts, to be concluded and finalized in a digital format. This shift has drastically changed how businesses and individuals engage in trade, allowing for greater efficiency and speed in transaction execution. It is expected that the economic dominance of integrated networks of transactions, including the increasingly popular digital contracts, will persist and even grow stronger in the forthcoming years. However, it is worth noting that Article 11 of the CISG specifically requires that contract modifications must be made "in writing", which apparently disallows digital contracts from qualifying as acceptable modifications or supplements under this legal framework. This raises significant questions about how traditional contract law will adapt to the evolving landscape of digital commerce. At the time the CISG was drafted back in 1980, the concept of digital contracts was a far-fetched idea, far removed from the reality we experience today in the realm of international trading practices (Eiselen, 2017: 55-57; Coetzee, 2017: 2-4).

The current absence of effective and comprehensive regulations for the creation, execution, and performance of digital contracts significantly hinders the overall development of numerous integrated digital transactions. These contracts are pivotal in today's economic landscape, particularly considering that international economic growth heavily relies on interconnected networks of contracts that span across global borders. As businesses aim to increase their degree of integration as a node within a digital supply chain, they can create substantial economic advantages, thereby attracting a greater volume of contracts, which in turn reinforces their competitive edge in the market. Furthermore, an integrated and thorough analysis of how the UN Convention on Contracts for the International Sale of Goods (CISG)

accommodates and supports the formation and execution of digital contracts is essential for understanding both its immense potential and the inherent limitations it may have in this rapidly evolving domain (Putrevu, Mertzanis, 2023: 2-4).

The underpinning impact of globalization is the enormous reduction in communication cost. The advent of the Internet has removed geographical constraints on communication and has facilitated record keeping and information storage. The creation, execution, and management of contracts are changing rapidly. Digital contracts, concluded and performed in digital format via the Internet, represent the direction of this evolution, potentially shaping future contract rules through repeated usage.

5. Digital Contracts and the CISG

Contractual transactions made by electronic and other digital means, including contracts made via third-party platforms, are valid and legally binding under the CISG. Arrangements for data processing or cloud services are governed by the provisions on contracts for the supply of goods and other rights.² Issues of shifting from paper to electronic communication activities are addressed within the CISG's rules on communication of information, notices, and other formal requirements.³ Applicability is neutral to the underlying information system; any data source or content delivery medium (including data messages, audio, video, and software code) can thus be used and managed. Nevertheless, problems may arise with the electronic communication of information governed by the CISG. Although the text does not expressly mention data messages or digital means, the Convention's neutrality towards "means of communication" (Article 12) accommodates the inclusion of electronic communications and modern technologies (Winer, 1998: 1-3). At the same time, different legal concepts of signature or internationally conflicting approaches to e-evidence, authentication and security may complicate judicial or arbitral decisions.

5.1. Formation of Digital Contracts

The CISG regulates the formation of contracts without requiring any formalities and does not exclude contracts concluded electronically or by other means of communication (Winship, 2015: 151-166). Practicability of performance, by both parties before the contract is concluded, remains an issue. A binding contract may come into existence before the parties decide

² See: Section 3 of this paper "Key Provisions of the CISG".

³ See: Section 3 of this paper "Key Provisions of the CISG".

whether to continue negotiations or proceed with a sale via a different platform. When a binding contract is concluded, it must be performed in accordance with its terms, raising the question of how performance is possible at an earlier stage.

5.2. Validity and Enforceability

Contracts concluded by electronic means are valid and enforceable provided they satisfy the relevant substantive and procedural requirements (Winer, 1998: 1).

6. Electronic Communication in CISG

The digital revolution has radically altered international trade by providing new modes of communication, facilitating the formation of contracts between parties thousands of miles apart and enabling their quick performance. When the CISG was drafted in the early 1980s, it did not include specific provisions on electronic means of communication other than the telegram and telex (Art. 13 CISG). Yet, the development of modern forms of digital communication has prompted reassessments over the contract formation parameters, the transmission of notices under the CISG, and the presentation of evidence in disputes relating to contracts for the international sale of goods.

During the formation of contracts, electronic means of communication may serve either as the medium for the transmission of a contractual offer or acceptance, or as the platform on which e-commerce contracts are concluded. The primary concern as to whether the CISG allows the conclusion of contracts via modern means of communication is the ability to identify (from an offer or acceptance) a person who intends to make a proposal or to be bound under Article 14(1). Clear indications of intent to be bound may readily be found in e-mails by using appropriate standard clauses within the body of the message. A contract may also be concluded via a 'click-wrap agreement'. The CISG does not preclude parties from forming contracts electronically, and its general provisions governing contract formation support the conclusion of contracts by electronic means (Eiselen, 2017: 72).

A number of articles within the CISG also concern the transmission of information between trading parties. Both Article 22 and Article 27 of the CSIG impose requirements for the issuing of notices, whereby the former provisions are applicable to negotiation and the latter to the avoidance of contracts. When such notices are sent by electronic means, the receiving party will often be able to establish through software that notifications sent by e-mail or other digital mediums have been properly transmitted and

delivered. Online systems may also generate automated responses confirming the receipt of messages on a certain date and time. Although electronic systems often generate automatic confirmations of receipt, such confirmations do not guarantee that the message content has been delivered in full and do not easily allow for determining the authenticity or integrity of the sent document. However, any problems related to proving the transmission do not concern the question of whether the CISG permits the use of these electronic systems.

Electronic means of communication may not only transmit information enabling contract formation and serve as a platform for the conclusion of contracts, but they may also represent evidence in proceedings involving contracts for the international sale of goods. Evidence governed by the CISG includes statements made by the parties before or during negotiations, the circumstances surrounding the conclusion of contracts, and the practices and usages in international trade envisaged in Articles 7(1) and 9 CISG. The possibility of storing such evidence electronically and transmitting it to tribunals in rapid and reliable manners has greatly facilitated evidence offered in support of claims and defences if a dispute arises. The acceptance of digital data rather than the production of documents in paper form has created problems concerning the generation of best evidence but, again, these difficulties are ancillary to the principal question raised by electronic communications. A wide range of computer resources has strengthened the position of trading parties involved in proceedings concerning contracts governed by the CISG.

6.1. Notices and Acknowledgements

Even before the advent of the Internet, international sales law would have had to adopt a flexible approach to electronic communication. In an international context, the purist view that communications must be contained in a single document cannot be justified for reasons of practicability.

According to Article 27 CISG, a notice may be given by any means of communication appropriate to the circumstances, including fax, telegram and electronic mail (Liu, 2004: 2). The ordinary meaning of “any communication” encompasses electronic forms of communication. To rule out electronic communication, it would be necessary to introduce an unwieldy and restrictive construction of the term contrary to the object and purpose of the CISG. Some authors agree with this position; others consider that modification of the Convention is necessary before reconciliation can become a possibility (Neumann, 2014: 2-4). However, if the parties have agreed on a restricted list of communications, only these should be allowed; an agreement to exclude “other appropriate communications” is likely to be unenforceable.

6.2. *Electronic Signatures*

Under the CISG, an electronic communication that satisfies the conformity criteria qualifies as “a signature.” Hence, it is generally accepted that a contract signed by electronic means falls within the CISG’s scope. Yet, this acceptance is not universally undisputed.

The CISG does not explicitly incorporate the notion of “electronic signature”; the term does not appear in the text. Article 11 CISG allows contracts to be “proved by any means, including witnesses”; yet, the existence of the contract is distinct from the signature requirement; the former communicates offer and acceptance and formation, while the latter indicates identification and assent. Considering the historical origin, the drafters used the term “signature” based on 19th-century conventions, assuming a physical mark or seal was necessary (Eiselen, 2017: 55-57). Prior to the emergence of ‘digital signatures,’ computer-generated documents were not regarded as “signed” simply because they were communicated by computer. Consequently, electronic contract parties often continue to seek a physical signature.

Nonetheless, the CISG provisions strongly support the premise that an electronic signature fulfills the signature criteria. Article 8 (2) CISG requires adopting a reasonable person standard when discerning intentions. According to Article 13 of the CISG, the term “in writing” includes telegram and telex; in modern interpretation, it is extended to various forms of electronic messages. Following these guidelines, an electronic data message conveying consent through a document-signing program operating on a computer, despite not resembling a physical signature, should be recognized as a signature according to the CISG criteria.

7. Digital Evidence in Disputes

Digital evidence originates from electronic communication. In the context of the CISG, such electronic communications are treated exactly like a standard, non-electronic communication. Hence, digital evidence embodied in an electronic communication should not, by itself, be subject to a specific evidentiary regime different from one applicable to a standard contract (Eiselen, 2017: 72). Nevertheless, issues may arise when digital evidence goes beyond the mere electronic communication. This is the case when digital evidence presents several specific characteristics which make it no longer comparable to traditional evidence. In such circumstances, several questions ought to be answered. How does the CISG deal with a situation where electronic communication is admitted as evidence introduced in a dispute over an international sale in which, in principle, nothing distinguishes a ‘digital’

from a 'standard' case? More generally, how can digital evidence be assessed and evaluated within the context of disputes related to the CISG?

From a comparative law perspective, the evolution of the question of evidentiary rules offers some general clarifications (Winer, 1998: 1-2). The question of evidence in an international context is complicated enough. Currently, there are several competing regimes and transnational rules. Within the context of 'digital' disputes, there are several issues, among others: (i) electronic data can be easily altered; (ii) the authenticity and integrity of electronic evidence are often uncertain and sometimes illegitimate; and (iii) evidentiary rules aiming to regulate the preservation and production of 'digital' evidence are generally underdeveloped. Despite a high level of standardisation and harmonisation regarding the CISG in international trade, no specific provision deals directly with the evidentiary rules applicable to 'digital' evidence. However, considering that the context is about an electronic communication submitted as evidence of another electronic communication, it should not be subject to specific and additional evidentiary rules and should be entirely covered by the standard CISG's principles.

7.1. Admissibility of Digital Evidence

Digital evidence (i.e. the admissibility and consideration of such evidence in CISG-related proceedings) raises questions of interpretation in the context of transactions executed via electronic means. The CISG does not specify the classification of digital evidence in relation to the Communications and Other Conduct of the Parties (Arts. 8 and 9 CISG) or the requirements governing Evidentiary Weight (Art. 11 CISG). The UNIDROIT Principles clarify that electronic data messages, as specified in Art. 2(a) of the Convention on the Use of Electronic Communications in International Contracts, constitute evidence (Art. 4.13(2) UPICC). Most jurisdictions admit digital data as evidence in principle and allow for rules of evidence to be bypassed by explicit or implicit waiver, either in the contract or pursuant to Admissibility of Evidence principles; accordingly, electronic communications and digital data have the potential to function as compelling sources of proof.

In the context of digitalisation, various legal zones comply with this principle. Article 21(2) of the Hague Convention on the International Effects of Judicial Sales of Goods (1949) states that determinations concerning the burdens and standards of proof that have been stipulated by the law of the forum in civil or commercial matters shall remain undisturbed by the Convention. This general protocol has an autonomous status and further prevails beyond the range of instruments dealing with conformity of goods, none of which mention the subject matter of proof. The Hague Convention

thus offers a coherent framework that permits parties to submit proceedings involving other forms of digital evidence (Eiselen, 2017: 75).

7.2. Challenges in Proving Digital Transactions

Due to the absence of specific proof requirements, establishing the authenticity, adequacy and trustworthiness of digital transactions may be troublesome. Several articles govern the incorporation, requirements, and acceptance of evidence during the submission of digital proof, and considerable attention has been given to the admissibility of documents generated electronically and made available via computer. A distinctive feature is the assumption that usage, including trade usage and MiFID applicability to commercial operations, should be employed to interpret the scope of the legal notion of proof, an area that will continue to evolve over time. The regulation of the evidential value of handwritten, typed, copied, printed, faxed and, ultimately, scanned and transmitted signatures, either via postal services or electronic, is also considered (Eiselen, 2017: 95).

8. Jurisdictional Issues in Digital Sales

International trade in the 21st century is no longer limited to the traditional shipment of goods and often takes place in the digital environment on the basis of several forms of digital contracts, whose legal status remains unclear. While it is generally accepted that the UN Convention on Contracts for the International Sale of Goods (CISG) applies to contracts established by electronic methods, provided that they meet the definition of a contract under the CISG, and the issue of delineating to what extent the provisions of Articles 14–24 CISG reflect the patterns of offer and acceptance applied in the digital domain remains a subject of inquiry (Winer, 1998: 1-4). In light of the mounting scrutiny by courts and the diversified approaches emerging worldwide, this article provides an examination of the extent to which the CISG's regime for contracts that necessarily entail physical goods corresponds with the prevalent patterns of formation and performance for digital contracts, where the merging of goods and services is commonplace.

8.1. Choice of Law

The CISG provides a uniform regime for sales contracts. It applies between parties whose places of business are in different Contracting States, or when rules of private international law lead to the application of the law of a Contracting State. By establishing its own terms, the Convention applies independently of its internal choice-of-law provisions. Although its scope is wide, Contracting States may limit the application of the CISG by reservation.

The conditions for application of the CISG are stated in Article 1. If parties have places of business in different Contracting States, the Convention applies (Art. 1(1)(a)). Alternatively, the CISG also governs contracts subject to the law of a Contracting State by private international law ("conflicts rules") (Art. 1(1)(b)). Several Contracting States, including the United States, have made a reservation excluding application of this latter ground (Article 95). The wording of Article 1 implies that the second condition may also operate when parties have places of business in the same Contracting State. However, the drafters' intention, which has been incorporated in many official commentaries (Winship, 2015: 151-166), was that the national law in question must be the law of a Contracting State other than those where the parties have their places of business (Winer, 1998: 1-4).

Whether a contract is subject to the CISG also depends on the nature of the contract. By its terms, the CISG does not apply to contracts governed by the law of a Contracting State that are not "contracts of sale of goods" (Art. 1(1)). The CISG also does not cover sales by auction (Art. 2(a)), sales on execution or otherwise by authority of law (Art. 2(b)), sales of stocks, securities, investment securities, negotiable instruments or money (Art. 2(c)), ships, vessels, hovercraft or aircraft (Art. 2(d)), electricity (Art. 2(e)) or consumer goods (Art. 2(f)). House Rules cannot provide a basis for the application of the Convention.

8.2. Forum Selection Clauses

The digitalization of international sales has created challenges to the resolution of disputes under the CISG, raising issues including forum selection. The CISG does not contain any rule governing the choice of forum for enforcement of contract rights or avoidance of the contract. Mailbox rules, discussed in Chapter 5, provide that an acceptance is effective when dispatched (even if, for example, it is sent to the wrong address). In the digital context, where multiple means of communication are available, the question arises as to whether an acceptance may be routed through the communication channel indicated by an offeror and how the issue of acceptance is resolved if one route is taken that results in an acceptance while another equally available route is disregarded by an offeree.

Limits upon derivative liability in communications allow a party to take the payment and transfer it instantaneously, without the involvement of the depositor in the communication channels that are necessary to make the payment. A crucial issue that arises in international sales involves ownership of electronic money. A seller accepting electronic money transfers may face huge difficulty in recovering the obligations that arise upon the disregard of informalities that protect buyers, and a defaulting buyer will be bet-

ter-placed to avoid liability than the one who provides more traditional forms of security, such as a guarantee and a banker's letter.

9. Case Studies on the CISG and Digitalization

Since its adoption, international contract practice and trade patterns have evolved significantly, with globalization and digitalization altering the landscape. This evolution necessitates a corresponding update to understanding and application of the CISG (Eiselen, 2017: 75). Trade finance, digital contracts, artificial intelligence, and international commercial arbitration provide key settings in which traditional CISG concepts now intersect with modern realities. Furthermore, the introduction of new information and communication technologies (ICT) raises new questions regarding the applicability and interpretation of the CISG. Hence, the subsequent sections examine relevant CISG rules and opportunities in relation to the digitalization of international trade on the initiative of the UNCITRAL and other international bodies.

9.1. Successful Implementations

Successful implementations of the CISG exist, even though such arrangements are rare and many of them involve lingering legal issues. The CISG was designed to standardize the law of international sales, with the aim of enhancing legal certainty, facilitating increased trade, and correcting disparities in bargaining power (Winer, 1998: 1-4). The Convention's wide appeal is reflected in the support of 94 signatories, encompassing various legal systems and diverse nations at all levels of development. The global use of the CISG reflects shared perceptions by traders, practitioners, academics, and arbitrators of its continuing value. When implemented, it provides recourse in the international sale of goods when recourse would otherwise be unavailable. The identification, recognition, and pragmatic resolution of many ambiguous issues and the development of the Convention's motives provide guideposts for judicial interpretation. These attributes indicate further potential for affirmative development and increased use that rivals or even exceeds the 1970 UN Sales Convention, the *Lex Mercatoria*, and the 1980 UN Convention on Contracts for the International Carriage of Goods by Sea (Eiselen, 2017: 75-79). All these features are objective (measurable) indicators of its successful implementation.

9.2. Legal Challenges Faced

Several significant legal challenges arise when applying the CISG to contracts, negotiations, and dispute resolution involving electronic commu-

nications (Eiselen, 2017: 95-97). The digitalization of international trade gives rise to production- and system-related problems, including the provision of digital content. Knowledge of the legal issues at stake can clarify the choice of law or forum and offer useful tools to overcome such issues in contracts governed by the CISG (Schroeter, 2015: 19-22). Many national, European, and international initiatives seek to address or combine legal and technological issues concerning digital communications in international (sometimes cross-border) trade. Recent legislative initiatives often take over the existing CISG articles, providing an overview of the issues the CISG could also solve (Winer, 1998: 1-4).

10. Future Trends in the CISG and Digitalization

Technological trends such as Artificial Intelligence (AI) and blockchain have the potential to influence many aspects of the contract procurement and performance process. International contracts prepared or reviewed by an AI system would affect quality assurance and potentially e-commerce sale and formation under Articles 3 to 6 CISG. For example, an AI system might make an offer or enter a contract without a human party's awareness. The use of distributed ledgers like blockchain would regulate contract administration and performance in a more automated and efficient fashion, affecting Articles 29, 31, and 35 CISG (Eiselen, 2017: 95). To date, the CISG has seen significant uptake and application worldwide, yet only 93 Contracting States have signed or ratified the Convention. Therefore, a valuable comparative perspective is provided by examining how other treaties (including the UNCITRAL Model Law on Electronic Commerce and the Digital Contracts Directive proposed by the EU) address the challenges arising from digitalization. This comparative analysis confirms that the CISG is lagging behind in terms of alignment with the digital environment, and that significant effort is needed to develop, promote, and improve the application of the CISG, including the features derived from the UNCITRAL Model Law and the EU measures, to better assist Contracting States and businesses in explaining, implementing, and applying the Convention effectively.

Since the adoption of the CISG, the growth of technology has significantly altered the overall process of contract formation and execution, raising the question of whether the Convention has lost its relevance. Despite this selective lagging behind, the CISG remains a well-established international instrument with an already huge degree of acceptance. As of June 2022, more than 93 Contracting States have signed or ratified the Convention, representing more than 80 percent of global trade, whereas extensive case law continues to provide a detailed interpretation of the Convention and ensure legal certainty. By incorporating additional and updated mea-

tures, possibly deriving from the UNCITRAL Model Law, the EU Digital Contracts Directive, and other instruments available within the UNCITRAL (such as the proposed Digital Trade Chain Framework), the Convention can keep pace with the ever-changing innovations and support players engaged in international trade. In the digital age, therefore, the CISG remains a fit-for-purpose, reliable, and adaptable instrument for those involved in cross-border trade. At the same time, the Convention still leaves individual players with considerable responsibility in navigating the challenges resulting from digitalization (Winer, 1998: 1-4).

10.1. AI and Contract Management

Artificial intelligence (AI) may increase significantly the volume of international sales occurring each year. “AI-enhanced contract management” assists every step of the contract lifecycle, including contract development stage, contract effectiveness and applicability, contract negotiation and management, and performance and enforcement.

(1) **Contract development stage.** AI systems can help draft a contract, verify third-party paper contract templates, and prevent forgery. They can also organize and categorize contracts or add metadata.

(2) **Contract effectiveness and applicability.** AI systems can extract details from contracts to decide whether a contract between parties is in effect, whether a contract is applicable, and which provisions are relevant. AI systems can also evaluate and quantify the risks involved in a contract.

(3) **Contract negotiation and management.** AI systems can extract important information from contracts in the negotiation process and easily identify the major terms of a contract. They can also manage and trace the modifications and revisions of contract documents.

(4) **Contract performance and enforcement.** AI systems can monitor the compliance and performance of contracts after signing, analyze violations, or initiate dispute resolution procedures (Shih, 2020: 8-15).

10.2. Blockchain in International Sales

Blockchain is a digitally distributed, append-only data structure for storing transaction records recorded in block form. It is regarded by many as having transformative potential for international trade. In typical applications, transactions are verified by a network of computers, reducing the need to trust individual actors, while a distributed database protects against unauthorized data modification or destruction. Besides financial transactions, blockchain is increasingly used to document international supply chains, with projects involving building, tracking, leasing, and selling goods

such as ships and aircraft before the sale of the goods themselves can be implemented (Coetzee, 2017: 1-2).

Nonetheless, combined issues of blockchain's technological identity and the limits of the CISG often preclude the direct application of blockchain to sales contracts. A prime example is the inability of blockchain to transfer ownership or entitle possession under Article 69(1) CISG. Instead, ownership and possession remain governed by national law, which may refer to possession, title, intangible documentation, or other means for the transfer of ownership (Germain, 2012: 1-20). Any mechanism to transfer ownership or possession on blockchain thus becomes a national law issue unsupported by the CISG.

11. Comparative Analysis with other Legal Frameworks

The Vienna Sales Convention adapts to challenges raised by digital contracts, electronic communication, and digital evidence. A comparative analysis follows, considering the CISG alongside other legal frameworks addressing international sales and trade. For example, the UNCITRAL Model Law on Electronic Commerce⁴ tackles internet-based trade and digital communication. States have been adopting these Model Laws in rapid succession (Eiselen, 2017: 55-57). The European Digital Contracts Directive concentrates on consumer contracts conducted electronically or online. Private international law issues and jurisdictional problems arise in digitalized sales. Contracting parties can face disputes over applicable jurisdiction or choice of law (DiMateo, Ostas, 2011: 372-375). The worldwide multiplication of regulations and the divergence of national laws further complicate cross-border e-commerce disputes. Case studies illustrate how contemporary courts handle these problems, showing successful adaption of traditional legal frameworks as well as ongoing challenges.

11.1. UNCITRAL Model Law on Electronic Commerce

During an international commercial law conference, the keynote speaker Luca Castellani described the twofold UNCITRAL strategy concerning the CISG. The first part focuses on states which may use the CISG in order to modernize commercial law and avoid regional fragmentation, often caused by regional legislative efforts that fail to consider the global level. Countries with limited legal capacity may also view the adoption of the CISG

⁴ UNCITRAL (1996). UNCITRAL Model Law on Electronic Commerce (1996) (with additional article 5 bis as adopted in 1998), United Nations Commission on International Trade Law; https://uncitral.un.org/en/texts/ecommerce/modellaw/electronic_commerce

as a cost-effective solution. The second part targets trading parties, who may contractually opt into the CISG, where the Convention does not apply by default. The UNCITRAL Secretariat promotes the benefits and application practices of the Convention, while the CLOUT programme and the UNCITRAL Digest of case law support efforts to achieve uniform interpretation of the CISG. Concurrently, the UNCITRAL adopts a proactive approach to reviewing existing reservations which can hinder uniformity, and suggests that some of these reservations might be lifted. The CISG may also be supplemented by some other instruments, such as the 1974 Limitation Convention, which may provide legal certainty regarding time limits for dispute-resolution procedures in international sales of goods (Neumann, 2014: 3-4).

Many states have adopted the UNCITRAL Model Law, reflecting early indications of their utility (Eiselen, 2017: 48-50). This instrument enjoys widespread use as a global tool for harmonizing international commercial law. Several scholarly works analyze the Model Law's implications and application within a range of legal contexts. The framework is also referenced in cases involving electronic commerce and international sales, where it contributes to maintaining consistency and fairness in cross-border business transactions.

11.2. EU Digital Contracts Directive⁵

The proposed Directive on certain aspects concerning contracts for the supply of digital content was introduced by the European Commission in 2015.⁶ The Directive focused on contracts concluded between merchants and consumers, aiming to harmonize relevant rules within the EU. It sought to create legal uniformity between contracts for digital content and contracts for the sale of goods. Although many EU Member States have ratified the CISG since 1990, the CISG Contracting States often choose to exclude its application in favor of national law. The UNIDROIT Principles of International Commercial Contracts and the Principles of European Contract Law have been promoted as tools to support broader legal harmonisation across the EU. Directives on digital content and online sales, mainly implementing

⁵ On 20 May 2019, the European Parliament adopted Directive (EU) 2019/770 on certain aspects concerning contracts for the supply of digital content and digital services (the "Digital Content Directive"/DCD) and Directive (EU) 2019/771 on certain aspects concerning contracts for the sale of goods (the "Sale of Goods Directive"/SGD), which entered into force on 11 June 2019 and became applicable in EU Member States from 1 January 2022 (for the SGD) and 1 July 2021 (for the DCD).

⁶ EUR-Lex: Proposal for a Directive of the European Parliament and of the Council on certain aspects concerning contracts for the supply of digital content, COM/2015/0634 final - 2015/0287 (COD), Brussels, 9.12.2015; <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:52015PC0634>

minimum harmonisation, are significant steps within a tentative process of harmonising consumer contract law at the EU level. The proposed 2015 Digital Content Directive marks a departure from minimum harmonisation, aiming instead for maximum harmonisation in order to ensure that both lawyers and businesses operate on a level playing field, though this leaves less scope for Member States to provide additional consumer protections. Earlier regulations, such as the Consumer Rights Directive and the Consumer Sales Directive balance harmonisation with the possibility for Member States to offer further safeguards to consumers (Hoekstra, Diker, 2019, 100-103). The subsequent Digital Content Directive (EU/2019/770) and the Sale of Goods Directive (EU/2019/771)⁷ aimed to provide a clear-cut and simple legal framework concerning contracts for the sale of goods.

12. Recommendations for Stakeholders

The increasing digitalization of the international economy has confirmed the CISG's relevance, tapped its source as guidelines for tomorrow's business law, and expanded its applications beyond the traditional subjects of merchandise. Currently, most digital trading vehicles lack international uniformity and adequate infrastructure, and there is no consensus on data free trade. A large order of trade is governed by the CISG regardless of the trade vehicles involved. Many are lawful under national laws, but most digital methods restrict the application of or cannot adapt to the CISG (Eiselen, 2017: 55-57). The CISG has become a symbol for international uniform law and principle. Since the CISG is frequently used in transaction problems, contracting parties also often refer to its principles or applications under such rules in their letters of intent. Parties are advised to consider a uniform international law of contract beyond the CISG to handle major gaps in the existing legal framework that govern areas of digitalized international sales transactions and to protect global international transactions in the digital age, such as global data protection and compensation principles in times of force majeure, customs, and cross-border digital commerce.

Under Article 6, any variation of the CISG remains lawful unless it contradicts the mandatory party state laws. Parties usually emphasize "only subject to the CISG" statement as a prerequisite or an option to limit the

⁷ Directive (EU) 2019/770 of the European Parliament and of the Council of 20 May 2019 on certain aspects concerning contracts for the supply of digital content and digital services (the Digital Content Directive), PE/26/2019/REV/1, *OJ L 136*, 22.5.2019, (<https://eur-lex.europa.eu/eli/dir/2019/770/oj/eng>), and Directive (EU) 2019/771 on certain aspects concerning contracts for the sale of goods (the Sale of Goods Directive), PE/27/2019/REV/1 *OJ L 136*, 22.5.2019 (<https://eur-lex.europa.eu/eli/dir/2019/771/oj/eng>)

scope or use of digital trade vehicles. Going beyond the CISG, the parties should distinguish when the digitalized sales rule is applicable, such as the parameters designed to comply with the CISG and the category of risks to be covered when the trade falls outside the Convention. When parties apply an international sales contract to a contract for the supply of services, they need to consider whether the level of services or incidental services renders the CISG inapplicable or the party state law overrides the CISG under the derogation clause in Article 6 CISG. Electronic procurement remains a great application to avoid redundant procedures and to reduce transaction time and cost.

12.1. Best Practices for Compliance

The best practices support productive use of CISG contract rules with digital and cloud applications: (a) Draft and negotiate contracts solely in electronic form when practicable, to meet each contracting party's intent and avoid issues with conflicting paper versions (Visser, 1998: 1-4); (b) Specify whether ordinary mail or electronic communications are the means for offer, withdrawal, acceptance, or other notices, in accordance with the parties' contractual intent (Germain, 2012: 9-11); (c) Consider application of the third-party service doctrine or substitute delivery channels for electronic communications whose designated recipients no longer operate (Winer, 1998: 12-18). (d) Explicitly allocate responsibility between the parties, or to a third-party trusted custodian, for electronic evidence before the contract's commencement; (e) Employ appropriate dispute resolution clauses where uncertainty exists concerning jurisdiction or venue for litigation or arbitration; (f) Define the parties' obligations in the event of any temporary disruption in the availability of digital-connected goods; (g) Frequently monitor contract status with reliable cloud analytics technologies operating under express authorization; (h) Bank transfers constitute the most frequent method of payment for international trade (Winer, 1998: 12-18).

An electronic funds transfer obligation may be categorized as a performance obligation. The obligation to pay remains governed by Articles 53 and 54 CISG, but the unsettled issue is when an electronic transfer can be considered an implied bank guarantee or order for payment. Some commentators have advocated comparable organizational improvements, especially if approaching contract formation, negotiation, and performance from a computer-assisted perspective. Other observers have recommended preventive legal solutions rather than organizational reforms, notably when digital technologies cannot replace all essential aspects of personal decision-making (Bridge, 1997: 215-220).

12.2. Adapting to Technological Changes

The digital transformation of international trade has reinforced the globalization of world business and further accelerated the pace of commercial transactions throughout the world. The nature of relationships between trading partners has been reshaped by the widespread and constant use of modern communication and information technologies that have become increasingly available and affordable to businesses of all sizes and in all parts of the world. All businesses are now integrated into a single business ecosystem where commercial transactions take place virtually without time constraints or regardless of national boundaries. Technological innovation has created major new approaches to the organization of economic activities in commerce and international trade, based on the availability of digitized information and digital flows rather than the circulation of physical merchandise. It has brought about entirely new possibilities for performing commercial activities and created conceptual changes in performing classic operations of exchange of merchandise between suppliers and buyers.

Technological innovation has transformed the transmission of information and the circulation of data within the circle of international trade law and practice. Information processed in electronic form is increasingly accepted by governments, authorities, banks, brokers, and offices worldwide. The concept of communication as a physical note or letter is increasingly displaced by the reality of digitized streams of bytes, interpreted simultaneously as conversation, instruction, and adoption of contractual terms and conditions of the transaction. This rapid transformation highlights one of the main characteristics of the globalized business environment, where the concept behind a given business behavior is usually validated by international usage and market practice rather than by national principle or rule (Eiselen, 2017: 75-77).

13. Policy Implications for International Trade

Digitalization entails substantial challenges for regulators at national and international levels. Current international trade rules were drafted before the globalization's acceleration, and modern trade increasingly involves electronic procedures unanticipated in such frameworks. A growing number of laws, regulations, and standards (in both public and private law) impact each trade stage. Yet, many establishment and harmonization efforts largely remain fragmented and ineffective in enhancing international trade flows.

At the heart of contemporary international trade lies the uninterrupted exchange of goods, secured through proper invoicing and payments

via contractual mechanisms. The first major international framework regulating this contractual dimension is the United Nations Convention on Contracts for the International Sale of Goods (CISG) (Coetzee, 2017: 2). The CISG was conceived well before the current wave of digitalization and consequently foresees little room for modern electronic techniques and instruments. Even though it was predicted to remain relevant over the next decades (Winer, 1998: 1-4), some of its provisions indirectly seem unable to apply to electronic interactions. Many matters legitimately benefitting from reform still lie outside its scope.

13.1. Regulatory Frameworks

Multinational enterprises demand standardised, reliable forms of contracting in order to avoid the transaction costs, risk and uncertainty that result from navigating multiple contractual regimes (Coetzee, 2017: 22). Uniform approaches to legal instruments, rules and principles both facilitate cross-border trade and investment and reduce costs. The 1980 Convention on the International Sale of Goods (CISG) constitutes a generally recognised standard of commercial contracting for the sale of goods. It has been adopted by 94 states, including the world's six largest exporters. These account for 57% of global merchandise trade, 64% of global intra-firm trade and 48% of world services trade (Coetzee, 2017: 2). Therefore, the CISG provides a valuable benchmark for assessing the domestic arrangements required to support commercial contracting in the digital environment.

Negotiations on digital contracting draw heavily on the CISG provisions relating to contract formation.⁸ The recognised rules provide assurances of certainty and predictability that facilitate transaction planning and relationship building, which are the fundamental tasks in managing commercial risk and in sustaining long-term relationships of trust and cooperation. Most states have not formulated comprehensive electronic commerce laws and their willingness to do so largely varies with expectations for market development. The reliance on standard commercial rules developed in a pre-digital world appears incompatible with the increasingly important role of digital networks in modern trade.

14. Conclusion

The digitalization of international trade has brought about novel challenges for contracts concerning the international sale of goods. The interaction of traditional contract law and the law of digitalization continues to

⁸ See: Section 13.4 of this paper: "Digital contracts".

develop and calls for further research. Although the 1980 UN Convention on the International Sale of Goods (CISG) does not explicitly address digital contracts, its rules may still apply in many cases, provided that the contracts meet the general requirements for sale of goods or the relevant requirements of Article 3(2) CISG. Contracting Parties may opt in or opt out, depending on their familiarity with digital trade and the CISG. Electronic communications and signatures receive some consideration, with notice of avoidance deemed received when acknowledging receipt. However, many pilot projects do not address central issues such as jurisdiction, dispute resolution, data protection, security, and payment. The key provisions on contract formation and digital contract governance are contained in Articles 8, 11, 13, 14, 15, 18, 19, 21, 23, 25, 35, 36, 49, 50, 53, and 64.

The CISG, as a binding treaty adopted in 1980, has shaped international trade law by offering uniform rules on the conclusion of contracts for the international sale of goods and various rights and obligations of buyers and sellers. It has been ratified by over 90 states, encompassing more than 75% of worldwide trade. Countries that have adopted the CISG cover a wide international spectrum, including all major economies. Many CISG principles enjoy recognition beyond states parties, such as in the New York Convention of 1958 regulating the recognition and enforcement of foreign arbitral awards. The CISG also encompasses countries with large economies, such as India, Indonesia, Pakistan, Saudi Arabia, and South Africa. These states outline a vision for a future international sales law that addresses concerns and challenges highlighted by digitalization and the rise of digital trade forms such as electronic commerce.

The CISG provides a comprehensive framework for contracts covering all aspects of a sale, including the formation of contracts and their validity through a neutral approach. It excludes contracts for consumer and auction sales, agreements for the supply of goods to be manufactured, and contracts for services. Specific contracts such as sales by auction, exchange, or sale through agents or brokers may also fall outside its scope. Despite its extensive coverage, the CISG relies on classical contract law principles, which may need adaptation in the context of digital contracts and other digital trade forms. Consequently, the uniform law of international sales must be supplemented by additional rules or by referring to other legal sources. Projection onto other existing legal instruments, such as the Protection of Industrial Property Rights envisaged in the Paris Convention, offers a method for extending the CISG's applicability to these emerging forms of transactions (Schroeter, 2015: 24-26).

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Тихомир Крстић,

Адвокат,

Адвокатска канцеларија "Крстић", Ниш

Република Србија

БЕЧКА КОНВЕНЦИЈА О МЕЂУНАРОДНОЈ ПРОДАЈИ РОБЕ (ЦИСГ) У КОНТЕКСТУ ДИГИТАЛИЗАЦИЈЕ

Резиме

Рад анализира у којој мери и на који начин Бечка конвенција о међународној продаји робе (CISG, 1980) остаје примерена дигитализованој привреди. Аутор мапира кључне институте Конвенције—нарочито домет примене и закључење уговора (чл. 1, 14–24), права и обавезе страна и завршне одредбе—на савремену праксу електронског уговарања, платформске трговине и “смарт” уговора. Посебно се обрађују електронске комуникације и потписи (чл. 8, 11, 13), достављање обавештења (чл. 22, 27) и употреба дигиталних трагова као доказа, уз наглашене практичне проблеме аутентичности, интегритета и терета доказивања. Разматрају се и питања надлежности и меродавног права у прекограничној дигиталној продаји, укључујући интеракцију чл. 1(1)(а) и (б) са аутономијом воље и избором форума. У компаративној равни, CISG се смешта уз UNCITRAL модел-законе, UNIDROIT принципе и иницијативе ЕУ за дигитални садржај, чиме се идентификују подударности и преостале празнине. У погледу будућих трендова, разматра се утицај AI-подржаног управљања уговорима и блокчејн евиденција, уз напомену да питања својине и државине остају у домену националног права. Закључак је да технолошки неутрална правила CISG-а и даље нуде чврсту основу за међународну продају, али да ефикасна примена у дигиталном окружењу захтева пажљиво уговорно уређивање, јасне протоколе комуникације, договорено чување е-доказа и ослањање на допунске soft-law и регионалне инструменте.

Кључне речи: Бечка конвенција о међународној продаји робе (CISG), дигитализација, електронско уговарање, дигитални докази, блокчејн у међународној трговини.