

END-TO-END TRADE DIGITALISATION: PRELIMINARY FINDINGS FROM REGULATORY ANALYSIS

March 2025

Introduction

The United Nations Commission on International Trade Law (UNCITRAL) at its fifty-seventh session requested the secretariat to conduct a stocktaking exercise to examine all UNCITRAL legislative texts that referred to electronic aspects, including both UNCITRAL texts on electronic commerce and other texts that include provisions on the use of electronic means (A/79/17, para. 299). The Commission also requested a survey of the enactment of those texts and of the references to such texts contained in trade agreements. The secretariat was requested to circulate a questionnaire inviting States to provide the information and to submit copies of the relevant laws.

The International and Comparative Law Research Center (ICLRC) started a research complementing the stocktaking exercise of the secretariat. The main objectives of the ICLRC research are to identify the current state of implementation of the UNCITRAL documents, as well as to outline the alternative approaches and possible gaps.

Scope

The research covers a range of countries in terms of size, political regime, and legal system, from four continents.

The study covers the European Union (EU) as a single jurisdiction and 12 countries:

- Belarus (BY)
- Brazil (BR)
- China (CN)
- India (IN)
- Indonesia (ID)
- Kazakhstan (KZ)
- Kyrgyzstan (KG)
- The Russian Federation (RU)
- Saudi Arabia (SA)
- The United Arab Emirates (AE)
- The United Kingdom of Great Britain and Northern Ireland (GB)
- The United States of America (US)

The countries in question account for more than half of the world's population, approximately two-thirds of the gross world product and international trade.

Methodology

The research was based on a questionnaire embracing MLEC, MLES, ECC, MLETR, MLIT, and MLAC. It consolidates the UNCITRAL provisions on the end-to-end digitisation of trade based on the existing Model Laws and the Convention. The structure of the questionnaire follows the structure of the UNCITRAL documents, but in a generalised form. For ease of reference, each provision extracted from the UNCITRAL text has been given a short designation (e.g. "Writing"). The main purpose of the proposed structure was to avoid duplication of similar provisions contained in several UNCITRAL documents. An additional purpose of this exercise was to outline the structure of the model legislation on digital trade as a whole.

Questionnaires were filled out by experts in the legislation of the countries in question in the course of a desk research. Requests were sent to the ICLRC experts in January 2025, and most of the responses were received in early March. The experts were asked to compare the provisions on specific issues contained in the UNCITRAL texts and in the legislation of the relevant country. The conclusion of the experts on each specific field of the questionnaire was an assessment of the results of such a comparison. The questionnaire also contains the instructions to use one of the three colours to fill in the cells in accordance with the colour coding of the study (for visualisation purposes).

no regulation The subject matter is not subject to any specific regulation in your country, but general rules of commercial or contract law may apply	UNCITRAL regulation The relevant UNCITRAL provision is fully incorporated in the laws of your country. We kindly ask you to briefly describe this regulation	alternative regulation The issue addressed by the relevant UNCITRAL provision is regulated in the alternative manner by the laws of your country. We kindly ask you to briefly describe your country's approach so that we can use it for the proposals for further harmonisation and consolidation of UNCITRAL instruments.
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The ICLRC did not verify the questionnaires after they were completed by the experts. However, in the course of further research and the preparation of the aggregated visualisation (the heat map), some of the questionnaires were cross-checked between different experts involved in the project. In the process of aggregation, the possible discretion of each expert was also assessed.

Although the ICLRC acknowledges that the margin between the implementation of the UNCITRAL or alternative approach is vague, it does not seriously affect the aggregated visualisation. The research itself is largely quantitative and aimed at assessment rather than a strict conclusion on compliance.

Implementation of the UNCITRAL documents

	AE	BR	BY	CN	EU	GB	ID	IN	KG	KZ	RU	SA	US			
Electronic communications																
Consent to use														3	5	5
Technological neutrality of communication														0	3	10
Writing														0	7	6
Original														5	2	5
Time of dispatch														5	4	4
Time of receipt														5	4	4
Place of dispatch and receipt														8	1	4
Invitations to make offers														6	1	6
Withdrawal due to error														7	4	2
Electronic signatures																
Signature technology neutrality														0	3	7
Compliance with a signature requirement														3	6	4
Reliability of signature														0	7	6
Conduct of the signatory														4	3	6
Conduct of the CSP														2	3	8
Requirements to CSPs														1	3	9
Conduct of the relying party														5	5	3
Recognition of foreign certificates and signatures														1	9	3
Identity and trust services																
E-identification and identity proofing														0	7	6
Electronic seals														4	7	2
Electronic timestamps														5	3	5
Electronic archiving														2	8	3
Electronic registered delivery services														6	5	2
Website authentication														7	2	4
Ex post recognition of reliability														5	4	4
Ex ante designation														2	1	10
Obligations in case of data breach														2	2	9
Cross-border recognition														2	8	3
Automated contracting																
Legal recognition of automated contracting														6	4	3
Computer code and dynamic information														10	1	2
Attribution of actions carried out by automated systems														8	3	2
Unexpected actions carried out by automated systems														12	0	1
Non-avoidance														10	1	2
Electronic transferable records																
Transferable documents or instruments														7	4	2
Control														8	2	3
Transfer														10	1	2
Endorsement														9	3	1
Amendment														10	1	2

Preliminary findings

The questionnaire consists of three logical sections. The first deals with **national laws and the principles** they embody. It aims to describe the legal basis for the regulation of digital trade in a country. When analysing this section, it is worth noting that the structure and architecture of national laws do not presuppose the regulatory approach. Neither codified legislation nor specific laws have advantages over the other.

The principle of **technological neutrality** is still a cornerstone of regulating relationships in the digital sphere. The research methodology does not allow to assess the actual implementation of this principle in practice. However, in one way or another it is declared in the legislation of all countries in scope. Technological neutrality is the organic way for legal instruments to deal with emerging technologies and changes in technology generations.

The **functional equivalence** principle is valid for several countries in scope. In some countries, however, it serves as a target principle, driving the digital transformation of outdated transactions. In other jurisdictions, functional equivalence is merely a tool to ensure the backward compatibility of digital trade regulations. In both situations, this principle cannot be treated as universal, as it has only transitional value.

Non-discrimination as a principle seems to be even more sector specific. Discrimination against paper-based transactions is increasing, and the new rules for digital trade (or at least those applicable to digital trade, such as electronic identification) are digital by design. The more automation is required by certain regulations, the more obvious the tendency to discriminate against paper-based transactions.

Although the questionnaires were not designed to identify new principles for regulating digital commerce, the trend of **convergence** is evident not only in technologies but also in regulation. Standalone laws on specific transactions are converging into comprehensive documents on electronic identification, digital commerce, or even digital codes. A comprehensive approach to the regulation of digital transactions helps to eliminate sectoral discrepancies and establish universal rules for identification and digital data turnover.

Considering the findings of the research, which revealed a variety of approaches to regulating relationships in the digital sphere, it is recommended that the principles of **compatibility and interoperability** be introduced. The diverse regulatory landscape reflected in the heat map is already in place and is effective. The principles of compatibility and interoperability may offer a more effective solution for facilitating seamless digital trade than just functional equivalence and non-discrimination.

The heat map is based on the triple logic of the experts' conclusions in the second section of each questionnaire. This section consists of five parts, with each part corresponding to a relevant UNCITRAL document (Convention or Model Law). The experts provided their opinion on whether the relevant UNCITRAL provision has been implemented, whether the national law embeds another approach, or whether certain relationships are not regulated by national law (intentionally or not).

The triple logic of the experts' opinions is expressed in the heat map in the following manner:

- "implemented" (colour green)
- "alternative regulation" (colour blue)
- "no regulation" (colour orange)

The balance between these three conclusions is shown in the right column of the heat map. There are the following possible variations of the balance.

The green colour is predominant when most of the countries in scope have implemented relevant provisions. This is the case for technology neutrality and the mechanism of ex-ante designation of identification and trust service providers (through accreditation or similar procedures). Complementary provisions for ex-ante designation, such as requirements for designated service providers, are also widely implemented.

Alternative approaches to regulation – represented by the blue colour on the heat map – reflect the fragmentation of the rules. Despite UNCITRAL's longstanding efforts to harmonise the rules, the mechanisms for recognising foreign signatures and trust services, as well as for the electronic archiving or fulfilling the requirement to be in writing, are not based on the UNCITRAL approach. The research indicates that in most of the covered countries, there is no default equivalence between electronic and paper documents, or between domestic and foreign documents. National legislation establishes some criteria for recognising equivalence, and in certain instances, different levels of equivalence are determined based on the reliability of the document.

The orange colour on the heat map highlights the growth areas. As would be expected, they include automated contracting and electronic transferable records. Most of the countries in scope do not have legislation on these topics, and the UNCITRAL documents could serve as an international standard for regulation. It is important to note the provisions where the heat map shows the combination of orange and green areas, i.e. in electronic timestamps and website authentication. In these situations, there is a valuable opportunity to transfer the best practices from countries that have already implemented the UNCITRAL approach to countries without regulation.

In general, the conclusions reflected in the heat map can serve as a basis for future work on developing new model rules for international digital trade and harmonising the existing ones. The standard-setting approach is not the only possible one, especially in the areas with strong alternative approaches implemented at the national level. The question is whether to inspire or be inspired by national rules.

Future work

Future work on the project will be based mainly on the last section of the questionnaires, which gave each expert the opportunity to identify three main issues that are or will be covered by national laws but are not yet reflected in the UNCITRAL documents. A summary of the results of the third section will be presented separately by the ICLRC in a dedicated online seminar. Further details will be announced on the ICLRC website, iclrc.ru.

We are pleased to **invite you to take part in the further evaluation** of the questionnaires. These can be accessed on the ICLRC website using the QR code on the right. We kindly welcome your feedback and comments, which should be addressed to info@iclrc.ru with the subject "ICLRC_UNCITRAL_Questionnaire."



About the ICLRC

The International and Comparative Law Research Center (ICLRC) is a Russian non-profit research organization established in 2014. The ICLRC specialises in the study, development, and dissemination of knowledge in the field of international law, participates in the work of international organisations as an observer, and creates opportunities for research and study of law.

- Observer to Working Groups III, IV, and VI of UNCITRAL
- Observer organisation to the United Nations Framework Convention on Climate Change (UNFCCC)
- Observer to the United Nations Environment Assembly
- The United Nations Environment Programme Finance Initiative (UNEP FI) Supporting Institution

The focus areas of the ICLRC include relevant topics such as international trade, international investment, biodiversity, climate change, plastic pollution, the EAEU, World Ocean, as well as general issues of public international law.

The ICLRC is dedicated to promoting international law studies. As part of this objective, the ICLRC organises the Summer School on Public International Law, the Investment Law and Arbitration Lab, the Scholarship for Young International Law Researchers, and implements a number of other diverse projects. Its library provides free access to classic and contemporary printed publications in various languages on public and private international law, international arbitration, comparative law, as well as electronic legal databases.