

EXECUTIVE SUMMARY

The promise of TradeTech – the set of technologies that enables global trade to become more efficient, inclusive and sustainable – is multifaceted, from trade facilitation to efficiency gains and reduced costs, to greater transparency and resilience of supply chains. Of particular interest for this publication is the potential of artificial intelligence (AI), blockchain and distributed ledger technology (DLT) and the internet of things (IoT) to shape the global trade ecosystem.

Although the technological innovation exists, the major challenge to the global adoption of TradeTech will be building international policy coordination. Here, trade agreements can play a key role. Trade agreements are generally technology neutral, and many existing trade rules apply to digital trade. Yet, developing explicit rules will be needed to provide further legal certainty as to how they apply in the digital field. Trade rules can:

- prevent a fragmented technological environment by encouraging international regulatory cooperation and by promoting regulatory harmonization and coherence;
- prevent governments from introducing discriminatory measures favouring local providers or measures that are unnecessarily trade restrictive;
- ensure transparency of regulatory requirements and procedures;
- enhance market access;
- facilitate foreign direct investment, such as investments in information and communications technology (ICT) to fortify TradeTech adoption.

Since 2010, regional trade agreements (RTAs) have increasingly integrated e-commerce and digital trade provisions. Recent RTAs, such as the United States–Mexico–Canada Agreement, cover a wider range of e-commerce issues than previously, including a chapter on e-commerce and digital trade. Governments have introduced digital-only trade agreements, such as the Singapore–Australia Digital Economy Agreement (SADEA) and the Digital Economy Partnership Agreement (DEPA) between Chile, New Zealand and Singapore, which address a

wide range of digital trade issues. Furthermore, more than 85 WTO members also participate in the Joint Initiative on E-commerce.

Despite these ongoing efforts, there remain many unseized opportunities and unexplored policies. According to public and private-sector experts, five building blocks (referred to in this publication as the 5 Gs of TradeTech) play a critical role in supporting trade digitalization and wide-scale adoption of TradeTech:

- Global data transmission and liability frameworks
- Global legal recognition of electronic transactions and documents
- Global digital identity of persons and objects
- Global interoperability of data models for trade documents and platforms
- Global trade rules access and computational law

Although some of the 5 Gs are commonly covered by trade agreements, unseized opportunities remain in connectivity, data sharing and e-signatures. Other 5 Gs are either not discussed in trade agreements or only in a few recent agreements, and include electronic transferable records, automated contracts, digital tokens, interoperability of data models, and digital identity of legal and physical persons and of physical and digital goods. These new policy frontiers can help to bring trade to a new speed, and work for all.

1 | GLOBAL DATA TRANSMISSION AND LIABILITY FRAMEWORKS



End-to-end trade digitalization requires global access to reliable, affordable and fast connections as well as a legal framework enabling data transmission across borders in a trusted manner.

Advanced technologies such as AI, blockchain and DLT and IoT require the development of ICT infrastructure and wireless technologies to enable continuous connectivity. In addition to access

to digital infrastructure, information, which can be personal, sensitive or confidential, needs to flow across borders while preserving the rights of individuals (e.g. privacy), companies (e.g. business confidential information) and governmental entities (e.g. data requests for law enforcement or regulatory purposes).

However, multiple challenges need to be addressed to allow the development of a global data transmission ecosystem, including closing the digital divide, promoting international standards and mutual recognition schemes relating to cybersecurity, addressing regulatory fragmentation, and clarifying or adapting liability frameworks. Closing the digital divide in terms of access, bandwidth and skills is more urgent than ever. International cooperation should also continue to foster regulatory convergence by promoting international standards and mutual recognition schemes relating to cybersecurity. The regulatory fragmentation across the world and sometimes even across different agencies within the same territory on how the content of data is regulated also limits the cross-border exchange of information for trade purposes. Similarly, private-sector practices by some entities to lock in data hinder the flow of information within and across borders. Lastly, given the complexity of advanced technologies and the multiplicity of stakeholders involved in their ecosystem, tracing back specific harmful actions to specific human input or to decisions in the design will be extremely difficult for an end-user without the (expensive) assistance of legal and technical experts. Large-scale TradeTech adoption will require liability frameworks to be clarified or adapted or new frameworks to be developed.

Trade agreements have contributed to the far-reaching changes of the telecommunications market, both hardware and software, since 2010. Multilateral, plurilateral and regional efforts highlighted in this publication should be further pursued by governments to foster global connectivity for all. These efforts include, *inter alia*, market access commitments in telecommunications services, adoption of the WTO's Information Technology Agreement (ITA), and integration of the net neutrality principle in domestic telecommunications regulation. The WTO's Technical Barriers to Trade (TBT) Agreement also promotes global regulatory coherence (via sharing and discussion of international standards at the pre-implementation stage) and global regulatory cooperation (via good regulatory practices, equivalence and mutual recognition) with respect

to cybersecurity rules on equipment, infrastructure, and software-enabled and network-connected goods.

Trade agreements can also play a key role in fostering regulatory convergence and interoperability, and in facilitating the exchange of information and good practices in areas such as privacy, law enforcement and regulatory oversight, competition and data-sharing mechanisms. Trade agreements could be leveraged to promote regulatory convergence and international regulatory cooperation and to foster interoperability of mechanisms, thus enabling the cross-border exchange of information while preserving the rights of individuals, companies and governmental entities. International cooperation should also facilitate the exchange of information among governments for law enforcement and regulatory oversight purposes as well as among companies for competition and innovation purposes. Trade negotiators could leverage the political momentum created by the negotiation of trade agreements to move on reforming mutual legal assistance treaties with a view to maintaining trust and timely access to remedies across borders. Similarly, trade agreements could encourage governments to exchange best practices on data-sharing mechanisms to mitigate market distortions arising from abuses of market dominance in digital markets, such as data services lock-ins.

2 | GLOBAL LEGAL RECOGNITION OF ELECTRONIC TRANSACTIONS AND DOCUMENTS



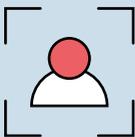
End-to-end trade digitalization requires a legal framework supporting the cross-border legal recognition of electronic trade documents and transactions.

The large number of documents involved in international trade places a heavy burden on businesses seeking to trade internationally, in particular micro, small and medium-sized enterprises (MSMEs). Due to burdensome documentary processes, it can take days to transfer and process trade documents and payments. TradeTech offers new opportunities to facilitate trade processes and automate trade transactions to increase efficiency and operational cost savings while enhancing the security and integrity of information. For governments, transaction and document digitalization can also contribute to better revenue collection. However, the cross-border use

of electronic transactions and documents is limited. Some governments have not yet recognized the legal validity and enforceability of electronic means when used in trade transactions. Those who have recognized them do not necessarily share mutually recognized criteria.

Governments could leverage trade agreements to support the global recognition of electronic transactions and documents (i.e. e-signatures and trust services, electronic transferable records, e-contracts) and to coordinate regulatory approaches on new emerging issues such as tokenization and smart contracts to avoid regulatory fragmentation. International standards and guidelines, such as the United Nations Commission on International Trade Law (UNCITRAL) Model Law on Electronic Transferable Records (MLETR), provide a useful basis upon which governments can work towards regulatory convergence. Systematically including a commitment to support these international frameworks in trade agreements would go a long way in facilitating the digitalization of trade. The sooner governments coordinate their regulatory approaches with respect to new TradeTech applications, such as tokenization or smart contracts based on autonomous systems, the less likely these national regulatory approaches will result in regulatory fragmentation. Governments should recognize that global regulatory alignment is one step towards the cross-border use of e-signatures and trust services and, more generally, of electronic documents and transactions.

3 | GLOBAL DIGITAL IDENTITY OF PERSONS AND OBJECTS



End-to-end trade digitalization requires a global approach to digital identities of natural and legal persons as well as of physical and digital objects sending or receiving electronic information to avoid creating digital identity silos.

In a digital environment, authenticating users electronically is necessary to establish confidence in user identities whenever the user interacts with a paperless trade system. Identity and trust lie at the core of any trade transaction. The move towards digitalization has led to an increasing number of digital identity systems being developed. While such systems contribute to greater transparency and predictability

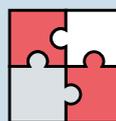
of and trust in supply chains, they often do not communicate with one another, creating silos and high frictional costs.

Governments could use trade agreements to avoid divergence of digital identity systems relating to legal and natural persons by leveraging international initiatives, setting up minimum identity attributes, and encouraging the development of a global certification framework.

In particular, governments could leverage international initiatives aimed at fostering mutual recognition of identifiers and attributes, such as UNCITRAL Working Group IV (Electronic Commerce) on digital identity and trust services or the World Wide Web Consortium (W3C) Verifiable Credentials Data Model. They could lead by example by setting up a minimum level and type of business data (or identity attributes) that would be made accessible to all parties involved in real time and on demand. Trade agreements could encourage the development of a global certification framework whereby accredited digital identity operators would issue globally recognized digital identities.

With respect to physical and digital objects, governments could use trade agreements to promote the use of open, global standards for product identification linked to product classification systems, and encourage customs authorities to agree on a standardized treatment of IoT devices. Linking product identification systems with product classification systems, such as Harmonized System (HS) codes, could also prove very powerful and provide the global trading system with more information about products moving across borders and with new functionalities. To guarantee traceability of objects, trade agreements could also encourage customs authorities to agree on a standardized treatment of IoT devices to promote their use throughout supply chains.

4 | GLOBAL INTEROPERABILITY OF DATA MODELS FOR TRADE DOCUMENTS AND PLATFORMS



End-to-end trade digitalization requires common definitions and structures of data to understand information exchanged across borders in the same way and to ensure interoperability between platforms.

For parties to seamlessly exchange electronic data and documents in a digital environment, all information needs to be clearly defined and unambiguous. Reaching agreement on both the semantic content (i.e. data definitions) and the syntax of data (i.e. data structure or format) is critical to ensure trading partners wanting to exchange information all understand the information in the same way. It is critical to ensure interoperability between platforms as well. Various platforms being developed, be they private-sector-driven in areas such as trade finance, transportation or national single windows (NSWs), follow their own rules and still often operate in isolation. Building bridges between the various platforms or developing common cross-sectoral or cross-jurisdictional approaches is needed to enable global flows of electronic data and documents.

Governments could leverage trade agreements to promote the use of existing semantic libraries, support the development and interoperability of data models for trade documents, and encourage interoperability of single windows. Both the United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT) and the World Customs Organization (WCO) have developed semantic libraries (“what means what”). Priority now needs to focus on promoting a much wider use of these existing semantic libraries to reach a critical mass of users. Further cooperation is also needed with respect to data models (the syntax). Many initiatives are underway to develop data models for trade documents, but they often evolve in silo, thereby undermining standardization efforts and in turn the exchange of electronic trade information. Trade agreements could support interoperability of data models for trade documents by encouraging the use of existing international guidelines and standards. Trade agreements have thus far encouraged the use of standards only for a limited number of trade documents, namely e-invoicing and e-certification for agricultural commodities. In the absence of guidelines or standards, trade agreements could encourage governments to accelerate standardization efforts at the global level. Trade agreements should recognize the critical issue of interoperability between NSWs. While many trade agreements, including the WTO’s Trade Facilitation Agreement, support the use of NSWs to expedite the movement, release and clearance of goods, only a small number of recent trade agreements address the issue of interoperability between NSWs.



End-to-end trade digitalization supported by computationally expressed trade rules would boost trade efficiency and inclusivity.

With continual economic integration, the rules that apply in cross-border contexts are becoming more numerous, technical in nature, complicated to understand and difficult to implement, especially for MSMEs. Many small businesses remain unable to identify and comply with market access rules – both tariffs and non-tariff measures (NTMs) – or to utilize preferences, the result of lengthy trade negotiations that were intended to enhance enterprise internationalization and competitiveness. Recently, legal innovations have sought to address administrative barriers to trade by expressing natural language rules in conditional programming forms to automatically provide users with legal answers that depend on the input of concrete, trade-related parameters. Yet, such projects have so far focused on which rules apply, rather than on how to comply with the identified regulations. The automation of this ‘operationalization’ step through computational law for trade policy could advance trade digitalization.

Computational law can help to bridge the gap between legal and governance structures, information systems and users on how to comply with regulations. Computational law is the branch of legal informatics concerned with the codification of regulations in precise, computable form and the automation of legal reasoning. As an interface between businesses, consumers and governments, computational law can build bridges between the various entities and software systems used in trade, with the potential to enable accessibility, automation, standardization, interoperability, cost reductions, transparency, and modelling and testing the effects of regulations.

Trade agreements could encourage governments to publish official machine-executable packages of trade policies and domestic rules that affect cross-border transactions alongside the deposited natural language texts. The development of a body of computational law has the potential to greatly enhance transparency, beyond existing WTO provisions, and could be monitored under existing mechanisms, such as the WTO’s Trade Policy Review Mechanism.