



Principle of Technological Neutrality in Trade Facilitations: A Legal Perspective

Ika Riswanti Putranti¹

¹ Universitas Diponegoro, Indonesia
ikariswantiputranti@lecturer.undip.ac.id

Abstract

Introduction to The Problem: Electronic and digital trade systems encourage the use of information technology in their services. One of these is the single window. Technology is a neutral aspect of life that can pose significant problems in facilitating trade. These issues stem from the large-scale use of ICT that may cause inefficiency, uncertainty and barriers to trade through discrimination. Regulations related to technology continue to adapt to existing developments so as to ensure a sense of security and legal certainty in the use of technology. The concept of technology neutrality was created by the state to regulate the impartial or neutral use of technology.

Purpose/Objective Study: This study aimed to describe the application of the Neutral Technology Principle in Trade Facilitation from a legal perspective and how the concept of neutral technology should be applied in international trade facilitation.

Design/Methodology/Approach: The methodology used in this study is legal research with the normative judicial approach.

Findings: The Principle of Technological Neutrality can guarantee the implementation of the principles of non-discrimination, efficiency, sustainability, and legal certainty in trade facilitation services.

Paper Type: Research Article.

Keywords: Trade Facilitation; Government Business; Law; Technology Neutrality.

Introduction

Study on the application of the Principle of Neutrality Technology in International Trade Facilitation is still very rare. Research on the Application of Neutrality Technology Principles focuses more on the study of this principle in the Intellectual Property Rights Act, especially regarding copyrights related to technology (Ali, 2009; Greenberg, 2016; van der Haar, 2007; Lipinski, 2003). However, along with the development of digitalization and automation in technology-based trade facilitation services, it becomes important to examine how far the application of the principle of neutrality technology is. This is interesting because the trade facilitation service system must not be impartial, discriminatory, and must have interoperability operations that are able to apply the principles in the implementation of international trade facilitation.



The Principle of Neutral Technology is one of the issues discussed at the WTO related to international trade. There are several studies that specifically discuss the role of the Principles of Neutral Technology in trade in goods and services.

According to Corina Dodi in her latest research in 2021, the principle of technology neutrality in international trade law has close relations with the issues of cybersecurity. The principle of technology neutrality has been explicitly recognized in several provisions of the World Trade Organization (WTO) Covered Agreements and free trade agreements. Corina Dodi studied the application of technological neutrality in trade in services, where commitments would apply regardless of the technology used to deliver the service, which may create further problems when States adopt trade-restrictive cybersecurity-related measures (Dodi, 2021). While (Kwak, 2021) revisits the principle of technology neutrality in the cross-border supply of services by electronic means, which is subject to the current rules-based trading regime. The principle of technological neutrality should be the key principle in the digital trade. The WTO World Trade Report methodically describes the role of technology neutrality within the WTO framework.

Meanwhile, Machi Tsokou in his paper presented in The Mine Award at the Web Summit in Lisbon 2021 states that technological neutrality can be used for various legal enactments. The neutrality of technology can bring certain effects such as a non-discrimination between technologies with equivalent effects and future legal proofs. Future Proofing implies that the same regulatory principles and rules apply regardless of technology (Tsokou, 2021). So given the rapid advances in technology, neutral rules aim to accommodate any future developments without having to create new laws. Therefore, the rules that are made must be able to avoid the use of certain technologies to produce certain legal effects on electronic documents. For example, regulations granting legal recognition only to electronic documents stored under certain cybersecurity measures, might appear to promote good practices in the use of technology, but risk excluding other unnecessary communications that are not normally encrypted, such as email or text messages (Jaller et al., 2020).

In some countries this principle is seen as a political tool to support one type of software license or as to support the freedom of techno-philosophical groups (Rios, 2013). Shadikhodjaev (2021a) states in his study, that not every country that exists today is willing to unconditionally acknowledge the application of 'old' rules to any pattern of trade that appears to be made possible by, or based on, digital and other technological innovations. Technology neutrality has been widely discussed in multilateral forums such as The World Trade Organization, the United Nations Commission on International Trade Law, and several regional trade agreements, in matters relating to electronic trade and digital trade. Trade regulations such as services, intellectual property and paperless trade, show how important the role of the principle of technology neutrality is that it must be given universal recognition and complemented by policy flexibility if needed due to different conditions in each



country ([Shadikhodjaev, 2021](#)). The European Commission explicitly introduced the concept of technological neutrality into its regulatory framework ([Briglaue et al., 2020](#)).

The principle of Technology neutrality must overcome "technological blindness". Sometimes laws are essentially blind to the differences between old and new technologies, thus potentially creating inequalities between technologies. Technological neutrality can create a normative balance in dealing with change ([Craig, 2013, 2015, 2016](#)). Meanwhile, technology-neutral ICT regulation is seen as an answer to the regulator's struggle to keep up with fast-moving changes in ICT ([Puhakainen & Väyrynen, 2021](#)).

After a long negotiation process, the "Trade Facilitation Agreement" has officially entered into force on February 22, 2017. At present, 149 member states of the World Trade Organization (WTO) have approved the amendment ([WTO, 2020](#)). The implementation of the International Trade Facilitation Agreement is reflected in the changes in trade facilitation services, that is, from manual business processes to digital business processes, that is, Facilitation 2.0. The transformation of government-to-government (G2G) and government-to-business (G2B) trade facilitation services is a complex field because it involves many stakeholders and complex rules. It is believed that the implementation of the International Trade Facilitation Agreement can reduce trade costs by as much as 14.3%, thereby promoting economic growth, especially for economic operators engaged in small and medium-sized sectors ([Ortiz, 2018](#)).

The changes in international or transnational trade that are shifting to the concept of e-commerce and market digitization require transparent, responsive, reliable and comprehensive trade facilitation services. This will be related to the different national capabilities of each country involved. This is often faced with the asymmetric conditions of trade facilitation services provided by countries with already quite strong national logistics systems and countries that do not yet have sufficient national logistics infrastructure. International trade will always be related to the constantly dynamically developing network of supply chains, policies, procedures, and legal rules. Therefore, the technology used in trade facilitation services must continue to develop to avoid hindering the continued progress of economic activities and reducing the risk of possible losses. For example, the inconsistency of existing technology and regulations may hinder services and may cause legal disputes and losses to economic operators and the government ([Ortiz, 2018](#)).

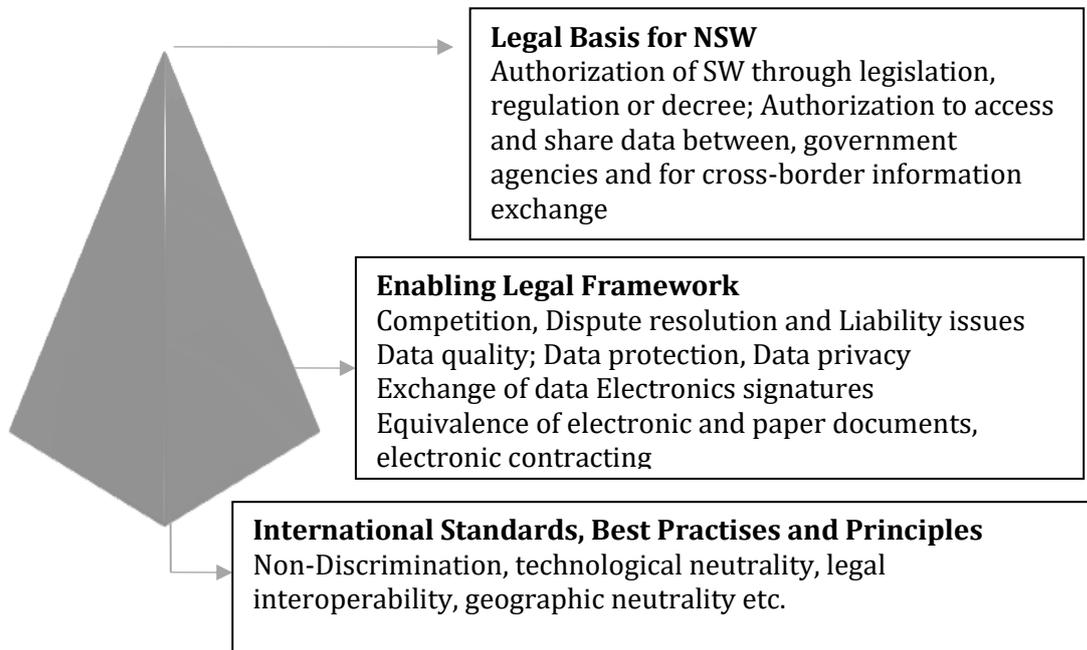
Impacts include technical interoperability and convergence rules issues. The Digital Declaration of Trade Facilitation is a single window service system implemented by many WTO member states. The concept of single window service itself is the authorized implementation of Article 10 Paragraph 4 of the WTO Trade Facilitation Agreement ([Levelu & Duval, 2019; WTO, 2017](#)). The concept of a single window legal



framework in the context of the ASEAN region was put forward in the Bali Concord II Declaration of the ASEAN Summit held in Bali on October 7, 2003. The purpose of the single window of ASEAN countries is to accelerate the process of international trade activities; create an integrated process environment in line with international trade practices during the release of goods; and reduce the time and resource allocation required for the process of distributing goods ([ASW, 2018](#); [UNECE, 2012](#)).

Indonesia has implemented a single window system since 2010 and has been included in multiple units under the Ministry of Finance. This is in line with the provisions of Article 4 and Article 13 of Presidential Regulation No. 10 of 2008 on the use of electronic systems within the framework of the Indonesian National Single Window, which has been revised by Presidential Regulation No. 35 of 2012. In addition, President Susilo Bambang Yudhoyono signed the Presidential Regulation No. 76 of 2014 on the management of the Indonesian National Single Window (INSW) ([BPK RI, 2014](#)). In addition, in 2018, President Joko Widodo passed the Presidential Regulation No. 44 of 2018 on the Indonesian National Single Window of the Republic of Indonesia, which strengthened INSW's status as a national single window institution ([BPDP, 2020](#)). The INSW system is an electronic system that integrates systems and/or information related to the process of processing customs documents, quarantine documents, permit documents, port documents, airports and other documents related to import and export to ensure data and information security and automatically integrate information flows and processes between internal systems ([Asmara, 2018](#); [Triyono, 2018](#)).

Internationally, the rules of the electronic service system are stipulated in the "United Nations Convention on the Use of Electronic Communications in International Contracts". In the preamble, the fifth paragraph contains two principles in the field of e-commerce, namely technological neutrality and functional equality. In addition, at the national level, the electronic service system is regulated by the Republic of Indonesia Law No. 36 of 1999 on Telecommunications, the Republic of Indonesia Law No. 11 of 2008 on Information and Electronic Transactions, and the Regulations of the Minister of Communications. And information number: /Per/M.Kominfo/ /2012 Regarding the implementation of guidelines for the interoperability of office documents for operators of public service electronic systems, UNESCO stipulates the elements of the legal framework for electronic single windows as follows ([UNESCAP, 2018](#)):



The principle of neutrality of the single window system service is something that the service provider (in this case the government) must abide by in order to comply with international rules and follow international best practices to ensure service continuity and legal certainty. Therefore, it is necessary to study how to apply the principle of neutral technology in trade facilitation from a legal perspective, especially in Indonesia (Stjin et al., 2011; UNECE, 2012). Therefore, the question is how to apply the neutral technology principle to trade facilitation from a legal perspective?

Research Methods

The methodology used in this study is legal research using the normative judicial approach. The normative judicial methods used for analysis are the statutory method and the comparative method. The legal approach is implemented by reviewing all laws and regulations related to the legal issues being dealt with. Legal methods will provide researchers with opportunities to understand the consistency and applicability of a law with other laws or legal systems (such as regional legal systems and international legal systems).

The next method is the comparative method, which is carried out by comparing the laws or regulations of one country or region with the national legal systems of another country or other regions. In addition, this research systematically explained the regulations governing certain types of laws, analyzed the relationship between the rules, explained the areas of law application that were considered difficult, and predicted the future development.

Result and Discussion

Trade Facilitation Concept

Arancha González, Executive Director of the International Trade Centre, described the concept of trade facilitation in the Internet of Things era as follows:

“Information and communication technology and business environment policies play an important role in promoting the growth of global trade. Trade facilitation has laid the foundation for more efficient cross-border trade. Trade facilitation agreements can reduce costs, simplify procedures, and improve the efficiency of cross-border goods movement. These factors not only lead to an increase in global trade in ICT products, but also enable government agencies and enterprises, including micro, small and medium enterprises, to quickly integrate technology into their productivity. In short, technology trade policies and trade facilitation can be catalysts for improving information and communication technology infrastructure and reducing trade costs. Ultimately, all these improvements will help increase access to low-cost products, thereby improving the lives of consumers in developing countries and reducing the digital divide”.

Therefore, in general, the trade facilitation agreement aims to increase global trade by facilitating the movement, release and licensing (movement, release and customs clearance) of goods including transit goods (Suryana, 2016). The trade facilitation agreement consists of three parts, namely (WTO, 2015):

- 1) The first part contains the rules for accelerating the movement of goods (movement), releasing goods and allowing goods in and out of the country (customs clearance), including transit goods. This section is a supplement and specification to Articles 5, 8 and 10 of the 1994 GATT Customs cooperation.
- 2) The second part contains provisions related to special and differential treatment (SDT) for poor countries and developing countries to determine the time for the full implementation of trade facilitation agreements, and to determine the capacity of each country to meet its commitments level. Its domestic capabilities determine the need for technical support and capacity building commitments.
- 3) The third part contains provisions for the establishment of a standing committee on trade facilitation in the WTO. In this case, member states are required to establish a national committee to promote domestic coordination and implementation of the provisions of the agreement. The National Committee also made some final regulations.

The Concept of Technology Neutrality

The rapid development of technology began with the introduction of computer network technology in the 1960s. Technology is a material with homogeneous and indistinguishable characteristics composed of tools, instruments, machines, organizations, media, methods, and technologies. At this time, the agricultural age and industrial age have transformed into the information age and communication and transportation, which makes technology a new way for mankind to live in the world (Ali, 2009). This brings various advantages and conveniences in all areas that can



support people's lives. According to Lovells et al., (2014a), contextually there are several definitions of principle technology neutrality:

- a. The principle of technological neutrality is defined as technical standards designed to limit negative externalities (e.g., radio interference, pollution, safety) must be able to describe the results to be achieved, but must also leave companies free to adopt whatever technology is most suitable to achieve those results.
- b. The principle of technology neutrality means that the same regulatory principles must apply regardless of the technology used.
- c. The principle of technological neutrality means that regulators must refrain from using regulation as a means of pushing the market towards a certain structure that the regulator deems optimal. In a highly dynamic market, regulators should not try to pick a technology winner (Lovells et al., 2014).

Nevertheless, technological development has also raised various questions about the lawmakers' regulations (Tuba, 2014). Sometimes people think that technology is no longer fully effective for human life, but will cause chaos and destruction in the peace of daily life. Therefore, technology supervision experts began to look for appropriate adjustments to new regulations to ensure the best use of technology (Ali, 2009). Technology-related regulations must continue to adapt to existing developments to ensure a sense of security and legal certainty during use. In this case, the concept of technology neutrality is the basic issue of regulating the use of fair or neutral technology.

In the preamble of the "United Nations Convention on the Use of Electronic Communications in International Contracts", the concept of technology neutrality aims to cover all factual situations in which information is generated, stored or transmitted in the form of electronic communications, regardless of the technology or media used. In the convention, the rules are "neutral," which does not approve or presupposes the use of certain types of technology, which can be applied to the communication and storage of all types of information. For example, technology neutrality includes media neutrality to promote paperless means equivalent to paper documents (Ali, 2009; Castellani, 2019).

The concept of neutral technology in the law aims to form a norm that regulates various technological activities as a whole. The rules should not specify technologies, nor should they attempt to hinder or hinder the use or development of future technologies. Therefore, the law should be broad, including all possible technical tools in the relevant regulatory framework (Tuba, 2014). The existence of a neutral technical concept in the legal formation process will reduce the risk that the currently effective regulations may become irrelevant or lag behind with the increasingly large-scale technological development. Therefore, the current effective laws and regulations can maintain harmony without losing their authority.



The Principle of Technology Neutrality

According to Chris Reed (2007a), technology neutrality has two main elements: "The basic rules must be the same online and offline (or more broadly, online technical activities are the same as equivalent offline technical activities). The rule of law must not support or discriminate against certain technologies." However, on the other hand, existing rules or laws should not hinder the development of future technologies. Neutral technology has also received extensive support from national legislators and international organizations (Reed, 2007b).

Essentially, a technology-neutral approach encourages the formulation of regulations that focus on the target function or value, rather than the specific type of technology used. In practice, technology neutrality means that the laws governing technology may not mention, designate, or describe a particular technology. The main goal of this approach is to prevent regulations and seek to adapt various technologies within the legal framework in the future. Therefore, this approach contains two important principles: the principle of non-discrimination; and the principle of forward-looking (Tuba, 2014). The formation of technology-related regulations should not involve specific technologies. Instead, regulations should simply define broad terms to emphasize more than one technology. In addition, the regulation should cover various future technological developments that have not yet been developed when the regulation is passed. In the economic and commercial fields, regulations based on the principle of technology neutrality should be flexible to cover rapid changes in technological development and market development. This flexibility is very important to prevent the increased use of specific types of technology or to grant that technology a special status (Tuba, 2014).

In addition, Ilse M. (2007) instruct countries to maintain and monitor technology neutrality based on four elements, namely a) Non-discrimination which means regulation should not favour a technology because it will reduce competition in the technology market; b) sustainability which means regulations must be flexible, time-resistant, and open to technological changes related to the scope of the regulations; c) efficiency which means regulations can be maintained, enforced or revoked in accordance with competitive market conditions; d) consumer assurance which means neutrality of technology can bring benefits through protective measures, no matter what technology is used, it must provide consumers with universal services. In addition to the efficiency, this idea encourages regulators to strengthen supervision not only to respond to technological developments, but also to effectively respond to changing market structures by becoming part of dynamic rules rather than relying on static rules.

Legal Genesis

The vast majority of scholars and legislators adopt the latter model of "technology neutrality" based on the assumption that it promotes legal life and equal treatment of old and new technologies. However, technological neutrality has inherent



shortcomings that weaken its ability to achieve these policy goals. Facts have proved that neutrality is neither the most ideal, and often self-defeating. It is also not neutral (Greenberg, 2016). As an example, technology neutrality in US Copyright Law was full of challenges on which technology neutrality should have eased the long-term struggle to adapt copyright to new communication technologies; revealing fundamental failures. With the promulgation of the Copyright Law 1a in 1976, Congress has remained vigilant against repeated requests to amend the copyright law based on new technologies (such as phonographs, movies, radio, cable transmission, etc.), believing that it has protected regulatory immunity in a technology-neutral way. Copyright law will be technology neutral (Lipinski, 2003). The need to adapt to new technologies is still the main driving force for copyright revisions.

The technical neutrality clause failed to adapt to future copyright laws, leading to many rapidly outdated amendments. Neutral clauses also amplify the complexity of copyright by promoting judicial inconsistency and adding uncertain *ex post* exceptions. Moreover, the technical neutrality clause is neutral in theory, but in practice it is specific to the technology; by focusing on the design, the judges have reached the opposite result for technologies with similar technical outputs but different designs, processes, or structures.

State Practice

With the increasingly large-scale development of information technology, the issue of technological neutrality has become a crucial issue. In order to control the now easier and wider accessibility, appropriate regulation is needed where technology becomes a neutral issue, especially in broadcasting, voice over IP, universal service, spectrum allocation, clear neutrality, information, and communications and telecommunications (Ali, 2009a). Therefore, countries around the world initiated by the United States and Europe are now continuing to develop arrangements related to the neutral technology system, which will affect all areas in its implementation.

The US government clarified for the first time the definition and meaning of neutral technologies in the Global Electronic Commerce Framework. In general, the regulatory framework includes administrative strategies of the US government to encourage businesses and consumers to increase their confidence in the use of electronic networks in business. In the “Global Electronic Commerce Framework” adopted in July 1997, the US government stated that “the rules must be technology-neutral and forward-looking (that is, the rules must not exclude any specific technology) (Ali, 2009a).

As the United States adopts the principle of technology neutrality in technology-related regulations, technology neutrality has also received public attention in Europe. The European Commission accepted the principle of neutrality in the 1999 Communications initiated in 1997 through the Converged Green Paper, which is one of the five principles supporting the European Commission’s electronic communications regulatory framework (Ali, 2009). According to the text of 1999



Communications Review (Damro, 2000), technology neutrality means that “the law must define the goals to be achieved, and it is not allowed to impose or discriminate against the use of certain types of technologies to achieve these goals. In its development process, the concept of “technology neutrality” is one of the key concepts of the new electronic communication network and services (ECNS) regulatory framework that came into effect throughout the European Union on July 24, 2003 (Alexiadis & Cole, 2015). In essence, technology neutrality seeks to ensure fair regulation of the use of alternative technologies in the delivery of relatively homogeneous products provided in a single market.

At the same time, in Indonesia, since 1999, the principle of technology neutrality has also received the attention of the government in the formation of technology-related regulations. The first law to incorporate the principle of neutral technology was Law No. 36 of 1999 of the Republic of Indonesia. telecommunications. Through this regulation, the Indonesian government adopted the prohibition of monopolistic behavior, emphasized the neutral technology principle of not favoring specific technologies, and carried out the third part of the regulations in regulating the market order. The third part of Article 19, paragraph 1, of Law No. 36 of 1999 of the Republic of Indonesia stipulates: “In telecommunications operations, activities that may lead to monopolistic behavior and unfair commercial competition are prohibited.

In the course of its development, the Indonesian government passed the Law of the Republic of Indonesia No. 11 of 2008 on Information and Electronic Transactions, which once again emphasized the principle of technology neutrality in technology-related regulations. Article 3 of Chapter 3 of the Information and Electronic Transactions Act No. 11 of 2008 of the Republic of Indonesia stipulates that “the use of information technology and electronic transactions is based on the principles of legal certainty, interest, prudence and good faith.” Beliefs, and the choice of technology or Neutral freedom. “Therefore, the Indonesian government seeks to provide neutral regulations on the use and development of technology to encourage sustainable national development.

More specifically, the application of the principle of neutral technology has also been implemented in Indonesia’s trade facilitation regulations. This is stipulated in the regulations of the Ministry of Communications and Information of the Republic of Indonesia No. 7 of 2013 on the Implementation Guidelines for the Interoperability of Office Documents for Operators of Public Service Electronic Systems. The Ministry of Communications and Information Technology of the Republic of Indonesia Regulation No. 7 of 2013, Article 1 on the Office Document Interoperability Implementation Guidelines for Public Service Electronic System Operators stated that “Guidelines for Implementing Office Document Interoperability” Public Service Electronic System Operators, hereinafter referred as the guide for public service electronic system operators to apply the Open Document Format (ODF) and Portable Document Format (PDF) which ensure the interoperability of office documents between public service



electronic system operators and other public service electronic system operations business, as well as between the operator of the public service electronic system and the users. The purpose of this guide is to improve quality and provide public services to ensure the integrity and availability of office documents exchanged in public services. This is consistent with the two main elements of technological neutrality explained by Chris Reed (2007b): "The basic rules must be the same online and offline (or more broadly, online technical activities are equivalent to offline technical activities).

In addition, the principle of technology neutrality is also reflected in the formulation of trade facilitation laws and regulations, specifically in the single window service developed in Indonesia. The single window service was initially regulated by the Presidential Regulation No. 10 in 2008 on the use of electronic systems within the framework of the Indonesian National Single Window, which was later amended by the Presidential Regulation No. 35 of the Republic of Indonesia in 2012. In addition, President Susilo Bambang Yudhoyono signed the Presidential Regulation No. 76 of 2014 concerning the management of the Indonesian National Single Window (INSW) portal on July 17, 2014 (BPK RI, 2014). In 2018, President Joko Widodo passed the 2018 Presidential Regulation No. 44 of the Republic of Indonesia on the Indonesian National Single Window, which strengthened INSW's status as a National Single Window Institution (BPDP, 2020).

When formulating regulations related to INSW, the Indonesian government adopted the concept of neutral technology by adhering to the principles of non-discrimination and forward-looking. This is as stated in Article 1 (2) of Presidential Regulation No. 35 of 2021, that is, "Indonesia National Single Window, hereinafter referred to as INSW, is the Indonesian national system that allows one-time submission of data and information", a single simultaneous processing of data information, a single decision for customs release and clearance of goods (INSW, 2019). In addition, Article 1(1) of Presidential Regulation No. 76 of 2014 also stipulates that "the Indonesian national single window (INSW) shall electronically process customs documents, permits and other documents related to import and export activities." Then, still in accordance with the previous interpretation, in Article 1(3) of Regulation No. 44 of the President of the Republic of Indonesia 2018, it is also pointed out that "INSW system, hereinafter referred to as SINSW, is a system and process related to electronic integration and processing of information system. Customs documents, quarantine documents, permit documents, port/airport documents and other documents related to import and export, to ensure data and information security, and automatically integrate information flows and processes between internal systems" (BPDP, 2020).

Through a series of regulatory developments, it can be seen that Indonesia's legal system has implied the concept of neutral technology in trade facilitation, which is reflected in single window services. The regulations governing the national single



window in Indonesia are neutral in terms of regulating technology and do not specify the use of certain types of technology (non-discriminatory). In addition, these regulations also provide a broad and inclusive explanation for various future uses or technological developments (forward-looking). Therefore, regulations related to the Indonesian national single window can avoid insignificant risks so that they can continue to be harmonious and maintain their authority.

Currently in Indonesia the set of rules related to existing electronic systems is regulated in Law Number 11 of 2008 concerning Information and Electronic Transactions Juncto Law Number 19 of 2016. The principle of Neutral Technology is related to electronic services such as electronic signature arrangements and contracts electronic systems that must be neutral means that the existing electronic system is open and not impartial in compatibility with other electronic systems. In addition to the Information and Electronic Transaction Law, the Neutral Technology Principle should also be adopted in laws related to technological developments such as the Copyright Law, Patent Law, and Consumer Protection Law. It aims to prevent harm to society and the public interest due to impartial technology.

Technology Neutral Concepts in International Trade Facilitation

Global trade is an important part of achieving sustainable economic growth. In the course of its development, international trade has also been affected by large-scale technological developments, which have allowed the originally manual business processes to penetrate into digitization. Therefore, countries are constantly striving to improve trade facilitation in order to create simpler and more effective processes and procedures in international trade. Moreover, the implementation of the trade facilitation agreement is now reflected in the changes in trade facilitation services, from manual business processes to digitalization, that is facilitation 2.0 (Soprana, 2018).

Nevertheless, the current barriers to international trade are not limited to taxes (tariffs). In addition, economic participants also face more complex issues in the digitalization of trade, such as technical interoperability and integration rules. Basically, every business process in international trade involves the exchange of relevant information between stakeholders in the form of trade-related documents (cross-border exchange of data). In the digitized business, the development of information and communication technology not only provides useful tools, but also forms a valuable environmental mechanism for countries to conduct cross-border trade more effectively through cross-border paperless trade. In international trade between countries, various documents and data are created in a certain jurisdiction, and then exchanged across borders and used in other jurisdictions. The same applies to documents and data in electronic form; the cross-border mutual recognition mechanism for trade-related data and documents in electronic form 2019. However, in practice, the interoperability of paperless trading systems involving various electronic services such as electronic files and electronic data often encounters



obstacles related to acceptance of verification and certification. In addition, according to a report issued by the World Bank, outdated and overly bureaucratic licensing procedures implemented by customs agencies and other agencies are now seen as a greater obstacle than taxation.

In this case, the concept of neutral technology plays an important role in supporting the formulation of regulations regulating local and international (cross-border) business process arrangements and the digital economy. The principle of neutral technology plays an important role in the implementation of public services and economic activities, because electronic information sent from one place to another must be accepted by all parties related to the existing technology. Electronic information for electronic transaction activities may be a collection of electronic documents that have legal consequences for the activities of the participants. In this case, the principle of neutrality in electronic services must be applied by the service provider (in this case the government) to comply with international rules and follow international best practices to ensure service continuity and legal certainty.

This has been reflected in Indonesia's regulations on the use of electronic system services. The use of electronic system services is currently used for import and export services. Since the publication of Presidential Regulation No. 10 on the use of electronic systems within the framework of the Indonesian National Single Window in 2008, the use of the electronic system services has begun. The electronic system must be used to process licensing documents related to the import of telecommunications tools and equipment within the framework of the Indonesian Single Window. By using electronic documents in this international trade facilitation service, it aims to improve the speed and quality of the service and provide support for the smooth flow of goods.

In the international order, efforts to eliminate barriers to trade flows can be achieved through the establishment of collaborative efforts, such as collaborative border management involving all stakeholders in the international supply chain ([Urciuoli, 2015](#)). Collaborative border management will bring various benefits to the government and the private sector, including reducing costs, reducing delays, enhancing security, and improving integrity and transparency. In order to realize these coordinated efforts, various services such as paperless trade, community ports, electronic ports, and single windows that are currently being implemented by countries all over the world require coordinated measures. Although the maturity of each country involved is different during its development, each country often has a similar goal, which is to try to provide trade facilitation through simpler cross-border trade and supply chain connection procedures ([APEC, 2015](#)).

In this case, in order to have the same impact on cross-border electronic transactions as physical transactions, it is necessary to establish a mutual recognition framework that allows parties in different jurisdictions to exchange and recognize documents



with legal effect (cross-border mutual recognition mechanism) acknowledged trade-related data and documents in electronic form. To ensure that the exchange of trade-related documents and electronic data remains valid, jurisdictions should establish mutual recognition of the validity of documents and electronic data exchanged across borders. To achieve mutual recognition, a mutual recognition arrangement (MRA) needs to be established to ensure the integrity, non-repudiation, authentication, confidentiality and legality of trade-related electronic documents and data. MRA includes various information, such as the roles and responsibilities of stakeholders, existing mechanisms, and competent supervisory agencies that conduct certification, testing, testing, and supervision. This will create an international best practice with an increase in confidentiality, legal compliance, and qualified assessments that are recognized and accepted by all stakeholders in international trade.

Neutrality and Personal Data Protection

The implementation of the International Trade Facilitation Agreement is reflected in the changes in trade facilitation services, from manual business processes to digital forms called Facilitation 2.0. This change in trade facilitation services is demonstrated by the adoption of electronic systems such as single window services in international trade. According to UN/CEFACT Recommendation No. 33, a single window (SW) is a facility that allows parties involved in trade and transportation to submit standard information and documents (usually in electronic form) through a single point of entry to meet all regulatory requirements and import, Export and transit are related. If there is electronic information, a single data element is only allowed to be sent once ([Shah & Srivastava, 2013](#)).

In the implementation process, there are related legal obstacles to the construction of the single window system; data protection and data quality in information technology are fragile issues. The main issues related to data protection and data quality are the verification, authentication and identification of various electronic signatures and electronic documents involved in cross-border import and export services. Electronic signature (electronic signature) is a technology-neutral term that refers to the process by which a person (signer) can electronically sign an electronic record ([Shah & Srivasta, 2012](#)). This includes passwords or PINs, names typed at the end of emails, biometric signatures (fingerprints, retina scans, iris scans, signature dynamics, voice recognition, keystroke dynamics, DNA, etc.) and digital signatures (public key cryptography).

The implementation of electronic signatures has become a necessary condition for ensuring the authenticity and confidentiality of information. Many countries/regions have enacted regulations to provide regulations on the use of electronic signatures. As far as the principle of "technology neutrality" is concerned, there are three different methods for implementing electronic signatures, including: digital signature method, two-pronged method, and minimalist method. The Australian government adopted Article 10 of the Electronic Transactions Act (ETA) of 1999 to formulate



regulations in a minimalist way, which stipulates that all types of electronic signatures are valid, not specific types of electronic signatures. Therefore, the Australian government's implementation of electronic signature regulations through ETA embodies the principle of technology neutrality.

On the other hand, some entities choose to adopt a two-pronged approach to formulate regulations, in which all types of electronic signatures are valid, but digital signatures have a special status (Shah & Srivastava, 2013). The United Kingdom government adopted the "Electronic Communications Act 2000" (UK) c7 (ECA) Section 7 (2) to formulate regulations for the implementation of electronic signatures. The bill embodies the principle of technology neutrality because it stipulates that all types of electronic signatures are valid, and the "Electronic Signature Regulations 2002" (ESR) Section 2 stipulates the standards for "Advanced Electronic Signatures, such as Digital Signatures". In addition, China has also adopted the provisions of Article 2 of the Electronic Signature Law (ESL) (Blythe, 2007), which embodies the principle of neutral technology, and has adopted the standards stipulated in Article 13 of the Electronic Signature Law (ESL) to have a reliable electronic signature as a digital signature.

Trade Facilitation Automation

As stated above, the development of ICT has been very influential in building trade facilitation automation systems in various countries, one of which is the single window system (Abeliansky & Hilbert, 2017; López & McQueeney, 2020; Moisé & Sorescu, 2021; Mugwe, 2022; Nath & Liu, 2017; Nawaz, 2021; Salim et al., 2020; Shi & Zhao, 2021; Wardani et al., 2019). Various national entities continue to develop sophisticated electronic services to support an increasingly digital economic system. This starts with the automation of the trading process and then moves to advanced features such as single window (SW). Various national entities continue to proactively implement various forms of paperless trading systems and strive to create a single window (SW) environment. Paperless trade, especially cross-border paperless trade, refers to "trade based on electronic communications, including the exchange of trade-related data and documents in electronic form" (Stokes, 2017). When implementing paperless trade and single window services, countries should follow international regulations and international best practices to provide services with good practices. According to Keretho (2019), the success of single window services and the implementation of paperless trade can be determined by the following factors: the determination of political tasks, the institutionalization of policies, the effectiveness of collaborative working groups, and the support of digital processes and also a sustainable business model.

According to Ha & Lim (2014), the paperless trade initiative is divided into three levels, namely the subregional level, the bilateral level, and the national level. Most paperless trade initiatives are often implemented at the national level. At the same time, at the international level, due to the different requirements of different



jurisdictions, the implementation of paperless trade faces many technical and legal challenges. The implementation at the sub-regional level can be seen through two major initiatives in the Asia-Pacific region, namely the ASEAN Single Window and the Pan-Asian Electronic Commerce Alliance (PAA). The ASEAN Single Window is an intergovernmental initiative that aims to provide services that facilitate customs clearance of goods to promote the economic integration of ASEAN through the National Single Window (NSW) connecting ASEAN member states. At the same time, the Pan-Asian Electronic Commerce Alliance (PAA) is a paperless trade service provider alliance aimed at realizing cross-border trade data exchange. Implementation at the bilateral level can be seen in the electronic certificate of origin between the Republic of Korea and Chinese Taipei. Together with other cross-border trade documents such as bills of lading and plant quarantine (SPS), the certificate of origin (C/O) has been identified as a key document and will be coordinated through the online system to achieve smooth paperless trade (Ha & Lim, 2014). At the same time, at the national level, Kenya is one of the countries that successfully launched paperless trade services through The Electronic Phytosanitary Certification (SPS e-Cert) launched in 2011.

The paperless trading system is an initiative to actively promote national development, economic growth and competitiveness. According to Standards and Trade Development Facility (2014) report, in the Asia-Pacific subregion, paperless trade is expected to generate US\$257 billion in export profits per year, shorten export time by 44%, and reduce export costs by 33%. At the same time, at the national level in Kenya, the launch of the electronic phytosanitary certification system helped increase government revenue by 75%. However, in addition to the benefits that cross-border paperless trade brings to all stakeholders in the international supply chain, the implementation of cross-border paperless trade is not easy because of various problems, especially in terms of coordination, unification, laws, policies and different technologies (Ha & Lim, 2014). Cross-border paperless trade must face various challenges, such as the use of international common standards, coordination of legal frameworks, capacity gaps between related parties, cooperation between the public and private sectors, and the lack of coordination mechanisms for data exchange across borders.

Conclusion

The Principle of Technological Neutrality can guarantee the implementation of the principles of non-discrimination, efficiency, sustainability, and legal certainty in trade facilitation services. The application of the Principle of Technological Neutrality must also pay attention to the gaps in technological progress and international trade governance that have been agreed by countries through single window commitments. The issue of non-neutral technology that has the potential to become one of the technical barriers in trade facilities must be given immediate attention so that it can encourage equal access for all business actors in accessing international trade facilitation.



Acknowledgment

The authors would like to thank Universitas Diponegoro for the funding and resources provided to conduct this research. Sincere gratitude also goes to anonymous reviewers and editors who have provided constructive feedback so that this manuscript looks worth reading and citing.

Declarations

Author contribution : Author 1: initiated the research ideas, instrument construction, data collection, analysis, and draft writing, revised the research ideas, literature review, data presentation and analysis, and the final draft.

Funding statement : This research is funded under Research Project Based on Decree of the Dean of The Faculty of Social and Political Science Universitas Diponegoro, Number: 00642/ Un7.5.7.2/ Hk/ 2020, Concerning Provision of Research Assistance in the Faculty of Social and Political Sciences Universitas Diponegoro in 2020.

Conflict of interest : The authors declare no conflict of interest.

Additional information : No additional information is available for this paper.

References

- Abeliansky, A., & Hilbert, M. (2017). Digital technology and international trade: Is it the quantity of subscriptions or the quality of data speed that matters? ☆. *Telecommunications Policy*, 41, 35–48. <https://doi.org/10.1016/J.TELPOL.2016.11.001>
- Alexiadis, P., & Cole, M. (2015). The Concept of Technology Neutrality. In *Ecta Review Section One: Regulation*. <http://euro.ecom.cmu.edu/program/law/08-732/Neutrality/EUNeutrality.pdf>
- Ali, R. (2009). Technological Neutrality. *Lex Electronica*, 14(514), 1–15. <http://www.aber.ac.uk/media/Documents/tecdet/tecdet.html>.
- APEC. (2015). Practices on Using ICT Infrastructure for Cross-border Trade and Supply Chain Connectivity by APEC Economies. In *APMEN Operational Center* (Vol. 53, Issue 9). <https://doi.org/10.1017/CB09781107415324.004>
- Asmara, C. G. (2018). *Jokowi Tambah Satu Lembaga Baru, National Single Window*. CNBC Indonesia. <https://www.cnbcindonesia.com/news/20180621141851-4-19900/jokowi-tambah-satu-lembaga-baru-national-single-window>
- ASW. (2018). *About ASEAN Single Window*. ASW. <https://asw.asean.org/index.php/about-asw>
- Blythe, S. E. (2007). China's New Electronic Signature Law and Certification Authority Regulations: A Catalyst for Dramatic Future Growth of E-Regulations. *Journal of Intellectual Property Chicago-Kent Journal of Intellectual Property*, 7, 1.



- <https://scholarship.kentlaw.iit.edu/ckjipAvailableat:https://scholarship.kentlaw.iit.edu/ckjip/vol7/iss1/1>
- BPDP. (2020, March 21). *President Joko Widodo Enacts Regulation to Support ISPO Certification - BPDP*. BPDP. <https://www.bpdp.or.id/en/president-joko-widodo-enacts-regulation-to-support-ispo-certification>
- BPK RI. (2014). *PERPRES No. 76 Tahun 2014 tentang Pengelola Portal Indonesia National Single Window*. BPK. <https://peraturan.bpk.go.id/Home/Details/41569/perpres-no-76-tahun-2014>
- Briglauer, W., Stocker, V., & Whalley, J. (2020). Public policy targets in EU broadband markets: The role of technological neutrality. *Telecommunications Policy*, 44(5). <https://doi.org/10.1016/j.telpol.2019.101908>
- Castellani, L. (2019). The contribution of UNCITRAL texts to paperless trade. In *United Nations Commission on International Trade Law*.
- Craig, C. J. (2013). Technological neutrality: (Pre)serving the purposes of copyright law. *The Copyright Pentology: How the Supreme Court of Canada Shook the Foundations of Canadian Copyright Law*, 9780776620, 271–305.
- Craig, C. J. (2015). *Technological neutrality a key issue in upcoming royalty case*.
- Craig, C. J. (2016). Technological neutrality: recalibrating copyright in the information age. *Theoretical Inquiries in Law*, 17, 601–632. <https://doi.org/10.1515/til-2016-0022>
- Damro, C. (2000). The EU's 1999 communications review an american perspective. *Info*, 2(3), 289. <https://doi.org/10.1108/14636690010801492>
- Jaller, D., Gaillard, L. S., Molinuevo, S. & Martin (2020). *The Regulation of Digital Trade: Key Policies and International Trends*. <https://documents.worldbank.org/en/publication/documents-reports/documentdetail/998881578289921641/the-regulation-of-digital-trade-key-policies-and-international-trends>
- Dodi, C. (2021). *Cybersecurity and the Principle of Technological Neutrality In International Trade*. <https://doi.org/10.32750/2021-0106>
- Greenberg, B. A. (2016). Rethinking Technology Neutrality. *Minnesota Law Review*, 100(4), 1495–1562.
- Ha, S. H., & Lim, S. W. (2014). The Progress of Paperless Trade in Asia and the Pacific: Enabling International Supply Chain Integration. *ADB Working Paper Series on Regional Economic Integration*, 137(137). <http://www.adb.org/sites/default/files/publication/152775/reiwp-137.pdf>
- Van der Haar, I. M. (2007). Technological Neutrality: What Does it Entail? *SSRN Electronic Journal*, 2007–009, 1–29. <https://doi.org/10.2139/SSRN.985260>
- INSW. (2019). *INSW (Indonesia National Single Window) - About Us*. <https://www.insw.go.id/>
- INSW (Indonesia National Single Window)*. (2019). Indonesia.Go.Id. <https://www.indonesia.go.id/layanan/kepabeanan/ekonomi/insw-indonesia-national-single-window>



- Keretho, S. (2019, September 23). *Single Window (SW) and Paperless Trade Implementation SW / Paperless Trade Implementation*. Institute for IT Innovation - Kasetsart University.
- Kwak, D. (2021). No More Strategical Neutrality on Technological Neutrality: Technological Neutrality as a Bridge Between the Analogue Trading Regime and Digital Trade. *World Trade Review*, 21(1), 18–32. <https://doi.org/10.1017/S1474745620000580>
- Levelu, A., & Duval, Y. (2019). Implementation of The WTO Trade Facilitation Agreement in Asia and The Pacific: 2 Years on. *ESCAPE Trade Insights*, 26. <https://drive.google.com/file/d/1Zzx1gUCTOCLYzIaGcb04sErouVW01GKQ/view>
- Lipinski, T. A. (2003). The Myth of technological neutrality in copyright and the rights of institutional users: Recent legal challenges to the information organization as mediator and the impact of the DMCA, WIPO, and TEACH. *Journal of the American Society for Information Science and Technology*, 54(9), 824–835. <https://doi.org/10.1002/asi.10269>
- López, R. A., & McQueeney, K. (2020). The Effects of Public Sector Governance on Trade: Does Foreign Trade Facilitation Improve Export Performance? *Encyclopedia of International Economics and Global Trade*, null, null. https://doi.org/10.1142/9789811200632_0011
- Lovells, H., Maxwell, W. J., & Bourreau, M. (2014). Technology neutrality in Internet, telecoms and data protection regulation. *Computer and Telecommunications L. Rev.*
- Moisé, E., & Sorescu, S. (2021). Trade facilitation in perishable agro-food products. *OECD Trade Policy Papers*, null, null. <https://doi.org/10.1787/a2995a7a-en>
- Mugwe, M. K. (2022). Automation And Trade Facilitation in Kenya: Lessons From Covid-19. *International Journal of Scientific and Research Publications (IJSRP)*, null, null. <https://doi.org/10.29322/ijsrp.12.02.2022.p12272>
- Nath, H., & Liu, L. (2017). Information and communications technology (ICT) and services trade. *Inf. Econ. Policy*, 41, 81–87. <https://doi.org/10.1016/j.infoecopol.2017.06.003>
- Nawaz, N. (2021). A Dynamic Optimal Trade Facilitation Policy. *The International Trade Journal*, 36, 102–122. <https://doi.org/10.1080/08853908.2020.1859021>
- Ortiz, R. (2018, April 20). *Facilitation 2.0: Enabling Trade in The Digital Age*. International Centre for Trade and Sustainable Development (Ictsd). <https://ictsd.iisd.org/opinion/facilitation-20-enabling-trade-in-the-digital-age>
- Puhakainen, E., & Väyrynen, K. E. (2021). The Benefits and Challenges of Technology Neutral Regulation – A Scoping Review. *PACIS 2021 Proceedings, July*.
- Reed, C. (2007a). Taking Sides on Technology Neutrality. *SCRIPT-Ed*, 4(3), 263–284. <https://doi.org/10.2966/scrip.040307.263>
- Reed, C. (2007b). Taking Sides on Technology Neutrality. *SCRIPT-Ed*, 4(3), 263–284. <https://doi.org/10.2966/scrip.040307.263>



- Rios, M. D. (2013). Technological Neutrality and Conceptual Singularity. *SSRN Electronic Journal*. <https://doi.org/10.2139/SSRN.2198887>
- Salim, Z., Pranata, N., & Sabilla, K. (2020). Benchmarking Singapore and Hong Kong to develop Indonesia's trade facilitation. *International Journal of Business and Globalisation*, null, null. <https://doi.org/10.1504/ijbg.2020.10032238>
- Shadikhodjaev, S. (2021). Technological Neutrality and Regulation of Digital Trade: How Far Can We Go? *European Journal of International Law*, 32(4), 1221–1247. <https://doi.org/10.1093/ejil/chab054>
- Shah, H., & Srivasta, A. (2012). E-Signature Issues in Cross-Border Single Window: A comparative analysis of Australia, The UK and China. *International Conference: Current Problems in Legal Theory and in Comparative Law*, 504–531.
- Shah, H., & Srivastava, A. (2013). Authentication and Recognition Issues in Cross-Border Single Window. *Journal of World Trade*, 47(6).
- Shi, R., & Zhao, Y. (2021). Research on the Problems and Countermeasures of Suzhou "Single Window" Construction of Trade Facilitation. *Do Business and Trade Facilitation Journal*, null, null. <https://doi.org/10.6914/dbtf.0101.001>
- Soprana, M. (2018, October). Facilitation 2.0: Services and Trade in the Digital Age. *Facilitation 2.0 in Regional Trade Agreements: Enabling Trade in the Digital Age*. https://www.researchgate.net/publication/328743616_Facilitation_20_Services_and_Trade_in_the_Digital_Age
- Standards and Trade Development Facility. (2014). *Facilitating safe trade: going paperless with SPS e-certification*.
- Stjin, E. van, Phuaphanthong, T., Kertho, S., Pikart, M., Hofman, W., & Tan, Y.-H. (2011). *Single Window Implementation Framework*.
- Stokes, P. (2017). *Background Paper Electronic Sanitary and Phytosanitary (SPS) Certificates in the Context of Paperless Trade*. May, 1–27.
- Suryana, A. (2016). *Fasilitasi Perdagangan: Kesiapan Indonesia Menghadapi Persaingan Global*. PT Balai Pustaka. <http://www.balaipustaka.co.id>
- Triyono, A. (2018). Pemerintah Bentuk Lembaga National Single Window. *CNN Indonesia*. <https://www.cnnindonesia.com/ekonomi/20180606204626-532-304107/pemerintah-bentuk-lembaga-national-single-window>
- Tsokou, M. (2021). *The insufficiency of technology neutrality and risk-based approaches: The necessity of adopting a human-rights lens when regulating AI*. Euroconsumers.Org. <https://bultin.com/artificial-intelligence/artificial->
- Tuba, M. D. (2014). The technology-neutral approach and electronic money regulation in the EU: Identifying the promises and challenges for future regulation in South Africa. *The Comparative and International Law Journal of Southern Africa*, 47(3), 372–400. <https://doi.org/10.2307/43894815>
- UNECE. (2012). *Single window for trade*. <http://tfig.unece.org/contents/single-window-for-trade.htm>
- UNESCAP. (2018). Single Window for Trade Facilitation: Regional Best Practices and Future Development. In *UNESCAP*. <https://www.unescap.org/resources/single-window-trade-facilitation-regional-best-practices-and-future-development>



- Urciuoli, L. (2015). Cyber-Resilience: A Strategic Approach for Supply Chain Management. *Technology Innovation Management Review*, 5(4), 13–18. <https://doi.org/10.22215/timreview886>
- Wardani, T. A. K., Azizurrohman, M., Tanthowy, A. H., & Wardani, D. K. (2019). The Effect of Information and Communication Technology (ICT) on Indonesian Bilateral Trade with Asean Countries Pengaruh Teknologi Informasi dan Komunikasi (TIK) pada Perdagangan Bilateral Indonesia dengan Negara-negara ASEAN. *Economics (Jurnal Kementrian Perdagangan)*. <https://www.semanticscholar.org/paper/428fc5d5765d5412a8d7f53a66111c45451a42f2>
- WTO. (2015). The Trade Facilitation Agreement. In *Tfafacility.Org*. https://www.wto.org/english/tratop_e/tradfa_e/tradfatheagreement_e.htm
- WTO. (2017). *Single Window and the WTO Trade Facilitation Agreement – Key Tools for Development*. Trade Facilitation Agreement Facility. <https://www.tfafacility.org/single-window-and-wto-trade-facilitation-agreement-key-tools-development>
- WTO. (2020). *Ratifications list | TFAF - Trade Facilitation Agreement Facility*. <https://tfadatabase.org/en/ratifications/over-time>