


Issue Paper



The Pattern of Electronic Signature Implemented in the U.S. and Related Regulations

Digital Identity for Digital Trade:
The Electronic Signature and Authentication Laws in the U.S.
Dr. Tzu-Hsiung Wang



Issue Paper

CTPECC holds a number of forums and seminars annually based on current issues in the global political economy. Inspired by these events, the *CTPECC Issue Paper* seeks to address opportunities and challenges in future regional development. *Issue Paper* also provides valuable information and perspectives, delivering the insightful views of experts.

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1.Introduction

With the development of technology, the access to internet has become simpler, and it costs much less for individuals to communicate with each other, to buy products beyond geographical barriers, to grab information around the world, and to carry out business activities. Digital trade brings convenience and benefits, especially during the lockdown period. Several regions implemented lockdown policy during the COVID-19 pandemic. According to the report of the UNCTAD (United Nations Conference on Trade and Development), ICT services grew to almost 14% of total services' exports of the world in 2020.¹

However, the booming digital trade and e-commerce also bring concerns about the security of personal data, the violence of privacy and its impact on fair competition. In this issue, Dr. Tzu-Hsiung Wang is going to share the practice of “Electronic Signature”, as a measure to identify digital activities and to facilitate digital trade, regulated in the U.S.

1. UNCTAD, “Trade data for 2020 confirm growing importance of digital technologies during COVID-19”, 2021/10/27.



2. Digital Identity for Digital Trade: The Electronic Signature and Authentication Laws in the U.S.

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According to the 2022 E-Commerce Trends to Watch issued by FedEx, the total of the U.S. retail sales channels via E-Commerce was expected to reach \$1.1 trillion dollars in 2022, accounting for 17.3% of the amount of the overall sales through retail sales channels. The average growth rate of E-commerce from 2022 to 2026 is expected to achieve 47%. The Asia market is expected to achieve a higher growth rate than average(51%) while the European market and the North American market is expected only to have a 42% and 35% growth rate respectively. The significant increase in E-commerce sales is partially attributed to zero-contact shopping preferred by consumers due to COVID-19. The digital transformation promoted by enterprises that have changed their business model and operational flow is also expected to contribute to this increase.

Both COVID-19 and the switch to digital transformation increased the cross-border trade of digital products and services — i.e., digital trade. To ensure the safety and reliability of digital transactions, the signature and genuineness of electronic documents related to digital trade, as well as identification and identity verification or qualification of the signatory of the electronic record, have become top priorities for regulators. Therefore, since the Geneva Ministerial Declaration on Global Electronic Commerce announced by the WTO in 1998, many regulators have established regulations on electronic signatures in digital trade agreements, such as the digital trade chapter in the USMCA signed between the U.S., Mexico and Canada, and the Digital Trade Agreement signed between U.S. and Japan in 2019.. According to paragraph 1 of Article 19.6 of the USMCA: “Except in circumstances provided for under its law, a Party shall not deny the legal validity of a signature solely on the basis that the signature



is in an electronic form”. Paragraph 2 of the same article requires that no party shall prohibit parties of an electronic transaction from mutually determining the appropriate authentication methods or electronic signatures for that transaction; or prevent parties of an electronic transaction from having the opportunity to establish, before judicial or administrative authorities, that their transaction complies with any legal requirements concerning authentication or electronic signatures. Article 10 of the U.S.-Japan Digital Trade Agreement also has similar regulations.

The U.S. has established general rules for cross-state transactions or international business activity aimed at the effectiveness of relevant electronic records and electronic signatures through the Electronic Signatures in Global and National Commerce Act (E-Sign Act), signed by President Clinton on June 30, 2000. In addition to the fact that the Secretary of Commerce promoted the acceptance and use of electronic signatures internationally in accordance with article 7031 of the E-Sign Act, the Secretary of Commerce also took every action necessary, in a manner consistent with the principles below, to eliminate or reduce to the maximum extent possible, the facilitation of the development of interstate and foreign commerce:

- (I) Remove paper-based obstacles to electronic transactions by adopting relevant principles from the Model Law on Electronic Commerce adopted in 1996 by the United Nations Commission on International Trade Law.
- (II) Permit parties of a transaction to determine the appropriate authentication technologies and implementation models for their transactions, with the assurance that those authentication technologies and implementation models will be recognized and enforced.
- (III) Permit parties of a transaction to have the opportunity to prove in a court or other proceedings that their authentication approaches and their transactions are valid.
- (IV) Take a nondiscriminatory approach to electronic signatures and authentication methods from other jurisdictions.



The term “consumer” as outlined in paragraph (1) of article 7006 of the E-Sign Act means an individual who obtains, through a transaction, products or services which are used primarily for personal, family, or household purposes, and also means the legal representative of such an individual. In other words, the transactions applicable herein are subject to the purchase of products or services for personal purposes without distribution or resale of such profit-seeking acts. As to the definition of “electronic”, it means “technology having electrical, digital, magnetic, wireless, optical, electromagnetic, or similar capabilities” in accordance with paragraph (2) of the same article. With the definition of “electronic” as a basis, the term “electronic record” as defined in paragraph (4) of the same article means a contract or other record created, generated, sent, communicated, received, or stored by electronic means. The “electronic signature” as defined in paragraph (5) means “an electronic sound, symbol, or process, attached to or logically associated with a contract or other record and executed or adopted by a person with the intent to sign the record.”

The National Institute of Standards and Technology (NIST) subordinated to the Secretary of Commerce proposed “Digital Identity Guidelines, SP 800-63-3” in July 2017 to provide guidance to enterprises. The addition and revision in version 3 were completed in 2021, and the collection of public and industrial opinions aiming at a draft of version 4 was completed on March 24, 2023. The highlights of the draft of version 4 of Digital Identity Guidelines include: (1) to increase the content of risk management and require continuous assessment aiming at the potential impact to cross-customer groups for the equity promotion; (2) to put an emphasis on providing selections for consumers and increase the list of acceptable identity proofing alternatives; (3) to provide phishing-resistant MFA (multi-factor authentication) and introduce requirements to prevent an automatic attack registration process for cracking down on cyber fraud and advanced cyber threats; (4) to add details regarding feedback from past implementation experiences to improve the clarity and operability of guidelines.



Digital identity guidelines define “identity” as “to describe an attribute or set of attributes of a single subject uniquely under the specific scenario”, while identity proofing means the process of a credential service provider (CSP) to collect, validate and verify personal information. When we use one or more authenticators to claim digital identity, authentication is the process to verify whether the claim is effective. The authenticator—e.g. cryptographic module—usually has one or more authentication factors. The authentication factors are divided into three categories: something you know, something you have, and something you are. If the digital identity is verified, it means that the technology and tools used for verification are controlled by the digital service to be used—instead of others. Identity authentication may be adapted to circumstances by different authentication strengths, i.e., the authentication assurance level (AAL) .

Aimed at whether the agreement of the opposition party is required for the use of electronic documents or electronic signature, the product or service provider may use an electronic signature or an electronic record to satisfy the requirement of a statute, administrative regulations, or even rules of law toward information, be it in writing, on condition that the consumer has affirmatively consented to such use and has not withdrawn such consent in accordance with subparagraph (1) of paragraph (c) of article 7001 of the E-Sign Act. Meanwhile, the consumer, before consenting, is provided with a clear and conspicuous statement— (1) informing the consumer of any right or the option of the consumer to have the record provided or made available on paper or in a non-electronic form, and (2) the right of the consumer to withdraw the consent of having the record provided or made available in an electronic form, and of any conditions, consequences or fees in the event of such withdrawal- including termination of the parties contract. In addition, the consumer must be informed whether the consent applies only to the particular transaction which gives rise to the obligation to provide the record; or to identified categories of records that may be provided or made available during the course of the parties’ contract relationship.



Other notices required include describing the procedures that the consumer must use to withdraw his/her consent; updating the information needed to contact the consumer via electronic means; and informing the consumer how, after the consent, the consumer may obtain a paper copy of an electronic record upon request and whether any fee will be charged for such a copy.

According to paragraph 3 of article 19.6 of the USMCA, notwithstanding paragraph 2 requiring that no party shall prohibit parties to an electronic transaction from mutually determining the appropriate authentication methods or electronic signatures for that transaction, a Party may require that, for a particular category of transactions, the electronic signature or method of authentication meets certain performance standards or is certified by an authority accredited in accordance with its law. According to paragraph 2 of article 2 of the Electronic Signature Act of Taiwan, an electronic signature means “data attached to and associated with an electronic record, which is executed to identify and verify the identity and qualification of the signatory of the electronic record and the authenticity of the electronic record”. As to which electronic signature technologies are satisfactory to the provision above and valid for the electronic signature as stipulated in “Electronic Signature Act”, many disputes arose. To resolve this issue, the Administration for Digital Industries and the Ministry of Digital Affairs convened The European Chamber of Commerce in Taiwan, the American Chamber of Commerce in Taiwan, The Bankers Association of the Republic of China, the Taipei Computer Association, and relevant associations for discussion on November 29, 2022, and announced an administrative rule on the “Electronic signature technology with electronic signature effects” (industrial economy No. 1114000229) on December 2nd of the same year. The rule listed common international standards for algorithm and information security technology, such as public key infrastructure technology and framework, the signature format or algorithm required by international organizations or major countries, the signature format established by the European Telecommunications Standards Institute (ETSI) and the signature algorithm established or approved by NIST or ISO, as guidance to stakeholders. With this rule in place, whenever the preceding algorithm or technological standards are applied in an electronic signature platform with the consent of the parties in use, the electronic signature would be effective.



This has resolved the difficulty encountered in identifying the so-called “electronic signatures”, which in turn promoted the development of the digital economy. Electronic signature service providers should also actively prove that their service conforms to the standards listed as examples in the rule, to gain market opportunities.



3. Conclusion

Compared with paper-based processes, electronic signature helps reduce the consumption of time and the cross-border barriers while conducting business activities. Based on the observation of Dr. Tzu-Hsiung Wang, since the consumption patterns have changed, electronic signature plays an important role in digital trade and e-commerce particularly in the post-pandemic era and digital transition. Hence, the regulation of electronic signature needs to be more comprehensive. In response to the lack of relevant regulation in Taiwan, Dr. Tzu-Hsiung Wang also mentioned “the Electronic signature technology with electronic signature effects”, which aims to resolve the issue of technical standard of electronic signature and to accelerate digital trade in Taiwan.

In APEC, digitalization is one of the major issues. Since 1998, APEC has passed “APEC Blueprint for Action on Electronic Commerce” to improve e-commerce technology, applications, practices and services. Then in the next year, the Electronic Commerce Steering Group, ECSG, was established to develop E-commerce regulations and policies in the APEC region. Till now, the issue of digitalization is on the agenda of APEC annual meetings. Thus, it is obvious that digital trade will continue to influence business activities worldwide. However, without standards and regulations of electronic signature, digital trade can’t be credible enough.