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# Revision of Recommendation 14: Authentication of Trade Documents[1]

**Submitted by the International Trade Procedures Domain (ITPD), Trade and Transport Programme Development Area for approval**

*Summary*

At its ninth session, in March 1979, UN/CEFACT's predecessor, the Working Party on Facilitation of International Trade Procedures (WP.4), adopted Recommendation 14 relating to "Authentication of Trade Documents By Means Other Than a Signature" (document TRADE/WP.4/INF.63, TD/B/FAL/INF.63).

The aim of this Recommendation is to encourage the use of electronic data transfer in international trade by recommending that Governments review national and international requirements for signatures on trade documents in order to eliminate the need for paper-based documents by meeting the requirement for manual-ink signatures through authentication methods that can be electronically transmitted.

Similarly, this Recommendation encourages the trading community and trade services providers to examine business processes to identify where signatures (of any kind) may be eliminated and for those processes where this is not possible, to pursue the electronic transfer of trade data and the adoption of authentication methods other than the manual-ink signature.

The present document contains the second edition of Recommendation 14, which the UN/CEFACT International Trade Procedures Domain (ITPD) has prepared. The current revision, approved by the UN/CEFACT Bureau, supersedes and replaces the first edition (TRADE/WP.4/INF.63).

It is submitted for approval by the 20th UN/CEFACT Plenary.

[1] Given the change in technology since the original (1979) version of this recommendation and the change in use of vocabulary, ITPD proposes that the title be modified from the original "Authentication of Trade Documents By Means Other Than a Signature" to the current proposition "Authentication of Trade Documents".

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# I. Introduction

1. The exchange of accurate, complete and timely information is fundamental to the efficient and effective conduct of domestic and international trade. Traditionally the exchange has been conducted by the use of paper-based documents. Increasingly, electronic equivalents to paper including on-line services have improved the speed and efficiency of data exchange for trading partners, trade services providers, government and other regulatory authorities and agencies.

2. A constant and continuing objective of the United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT) is the reduction of documents used in the supply chain between business partners both domestic and international. Where removal is not possible because of legal obligation, regulatory requirement or business need, UN/CEFACT has pursued the objective that the document should not require a signature to convey the intent of the party originating it or for the recipient to act on the information contained in it.

3. UN/CEFACT recognizes the aim of removing signature from all trade documents that remain in the supply chain is probably unattainable. Some trade documents will of legal necessity continue to require a signature. The requirements for a signature are tied to the use of paper documents. The ever increasing use of electronic or other automatic means of data transfer makes it desirable to find alternative authentication methods, some of which may eliminate the need for a signature entirely and some which may provide the electronic equivalent of a manual-ink signature. Since the first version of this Recommendation in 1979, a number of alternative methods of authentication have appeared and will probably continue to appear in the years ahead.

# Part one: Recommendation 14 on Authentication of Trade Documents

# I. Scope

4. This Recommendation seeks to encourage the use of electronic data transfer in international trade by recommending that Governments review national and international requirements for signatures on trade documents in order to eliminate the need for paper-based documents by meeting the requirement for manual-ink signatures through authentication methods that can be electronically transmitted.[2]

5. Similarly, this Recommendation encourages the trading community and trade services providers to examine business processes to identify where signatures (of any kind) may be eliminated and for those processes where this is not possible, to pursue the electronic transfer of trade data and the adoption of authentication methods other than the manual-ink signature.

[2] For the transition from paper documents to electronic equivalents in the various functions of an international trade transaction, see Lauri Railas, "The Rise of the Lex Electronica and the International Sale of Goods, Facilitating Electronic Transactions Involving Documentary Credit Operations", Forum Iuris, University of Helsinki, 2004, especially chapter VIII.

## II. Use of international standards

6. The use of international standards can play a key role in larger acceptance of chosen solutions and eventually, interoperability. In so far as possible, governments and private actors who intend to electronically exchange data using an authentication method should try to make use of existing international standards.

7. This document is part of a package of recommendations on trade standardization and facilitation (see Annex A.3). There are many aspects to electronic data exchange, many of which are the subject of several United Nations Economic Commission for Europe (UNECE) current and future recommendations.

8. The legal codification work in electronic commerce and electronic signature, undertaken by the United Nations Commission on International Trade Law (UNCITRAL) should be taken into account and used whenever possible as a foundation for developing electronic authentication legal infrastructure for both national and international transactions.

## III. Recommendation

9. UN/CEFACT recommends that governments and those engaged in the international trade and movement of goods:

- Actively consider the removal of the requirement for a signature (manual-ink or its electronic equivalent) from trade documents except where essential for the function of the document or the activity and refrain from requiring a signature in new rulings or practices.

10. Further, the UN/CEFACT, recognizing the importance of authentication methods in electronic exchange of trade-related documents, recommends that governments and those engaged in the international trade and movement of goods:

- Consider the introduction of electronic methods to authenticate trade documents;
- Create a legal or contractual framework that permits and gives equal status to such authentication methods.

11. In order to achieve this objective, UN/CEFACT recommends:

- A regular review of the documentation used for domestic and cross border trade by a joint public and private sector working party (or sector-specific working parties). The goal of the working party would be to eliminate the requirements for a manual-ink signature and where this is not possible, replace the manual-ink signature with other authentication methods.

# Part two:
# Guidelines for implementing Recommendation 14

## I. Introduction

12. These guidelines, which are complementary to UN/CEFACT Recommendation 14 on authentication of trade documents, are designed to assist governments and Trade in identifying the function and use of signature. They provide an overview of the main issues that should to be addressed, some of the tools that are available and the steps to be taken when moving towards electronic methods of authentication.

13. This Recommendation will be accompanied by two Annexes aimed at assisting Governments and Trade to envision ways in which electronic methods of authentication have been put in place or are currently implemented.

# II. Signature

## A. Definition of signature

14. The word “signature” in today’s vocabulary encompasses both manual-ink signature and its electronic equivalent.[3]

15. In its broadest sense, a signature (manual-ink or its electronic equivalent) creates a link between a person (physical or legal) and the content (document, transaction, procedure, or other). This link can be considered as having three inherent functions: an identification function, an evidentiary function and an attribution function.[4]

16. In international business relations, one of the basic foundations is trust between the parties; the requirements of a signature will, in many cases, most likely reflect that trust.

## B. Functions of a signature

- The identification function of a signature confirms or allows the establishment of the identity of that signatory; identification can include: the claimed/asserted identity of the person, the veracity of the identity claims, the credentials of any verifying organism, the proof of origin, the time and date, and any other aspect which identifies the related persons or the content.
- The evidentiary function of a signature will involve legal implications and can include: integrity, consent, acknowledgement, and detection of any changes in the document after it was signed. It can reflect any level of commitment which the act of signing might have indicated.
- The attribution function of a signature is the link between the signatory and the document which is signed. This can include the authority granted within the role (i.e. within a company, within a government authority, within the market…) of the signatory.

17. These three functions can be considered to be on variable levels. There can be more or less of each of these functions inherent in any signature.

[3] The original 1979 version of this Recommendation makes no distinction in the title because at that time, a signature was considered to always be manual-ink. As such, this term requires further precision in the current Recommendation title and throughout this document.

[4] These ideas of functions are developed in paragraph 7, page 5, UNCITRAL “Promoting Confidence in Electronic Commerce: Legal Issues on International Use of Electronic Authentication and Signature Methods,” United Nations, Vienna 2009. Available as of March 2013 at http://www.uncitral.org/pdf/english/texts/electcom/08-55698_Ebook.pdf. See also "Review of Definitions of "Writing," "Signature" and "Document" employed in multinational conventions and agreements relating to international trade, submitted by the Legal Working Group (LWG), Revision of Document Trade/WP.4/R.1096 dated 22 July 1994) Geneva, October 2001, ECE/TRADE/240."

## C. Methods of authentication

18. A signature or its functional equivalent is a common method of authenticating trade documents. These Guidelines use the term “to sign” and “to authenticate” in a similar manner.

19. The usage or the requirement of a manual signature presents major problems for modern high-technology data transfer in those instances where the data is transmitted to the country of (final) destination and where the manual signature must be available at the clearance of the goods. National legislation and international conventions should be changed wherever they impose a manual signature as a guarantee for the authenticity of information transmitted in this way.

20. Care should be taken when considering the terms presented here in chapter II (signature, function of signature and authentication). There are often different understandings of these terms depending on the environment (legal or technical). There can be further differences based on the region of the world these terms are being used. [5]

# III. Requirement for signatures on Trade documentation

21. In general, there are various uses of a signature on trade documentation. When considering a transaction from a manual-ink signature process to its electronic equivalent, it is necessary to consider the context of the transaction itself.

## A. Considering the legal context of the transaction

22. Generally, for business to business transactions, the legal requirements can be within the framework of commercial law. The requirements or trade practices may be further developed or defined by trade organizations for their members. Finally, many requirements within transactions between two independent trading partners will be explicitly defined in bilateral or multilateral agreements.

23. For transactions with government authorities or among government authorities, the legal requirements are defined almost exclusively within the framework of public law.

24. There may be several layers of public and private law to be considered: at a federal level, at a state level, at a ministerial level, at an agency level, at a regional level, at an international level, etc. It may also be necessary to consider several types of public regulations: commercial regulations, transport regulations, health regulations, customs regulations, etc.

25. Furthermore, a same document may be used by several agencies of a same government, or even of different governments. This may happen for instance, in the framework of single window facilities or coordinated border management. In these cases,

[5] In general, signature and authentication in an Information Technology (IT) environment often encompass some inherent functions which can vary from integrity, genuineness, proof, security, etc. Again, all of these terms can have differing interpretation based on environment and geography. This Recommendation has been prepared to align itself with the works of UNCITRAL while remaining consistent with the use of these terms in other UNECE trade recommendations. When reading or drafting any text on the subject, clear identification of which approach is being used, is recommended. For legislators who will probably use a legal definition, reference to UNCITRAL documents on the subject is recommended in order to clearly identify the legal use of these terms.

the requirements of authentication will need to be aligned so as not to put into doubt the validity of the data which is being communicated.

26. Legislation must not create stringent requirements which would put in doubt the validity and enforceability of otherwise legitimate transactions.

## B. Trade documents

27. Several interests can be affected by a chosen method of authentication; these include commercial, transport, financial and official. Problems may arise in documents that cross borders as they must be used in two different countries or regions. It should also be noted that the information in some documents may be of interest to more parties than the original and the final recipient of the documents.

28. Commercial documents can include the commercial invoice, certificate regarding quality and quantity, shipping advice and, or notification and credit note. The main principle of international trade law is that there is no formal requirement for a signature. Subject to an exceptional requirement of signature in national law, documents required for the practical performance of a contract need not therefore be signed.

29. Transport documents often involve a number of parties apart from the carrier themselves: exporters, importers, financers, insurers and authorities. The documents can include Export Cargo Shipping Instruction, Bill of Lading, Sea and, or Airway Bill, Consignment Note and Certificate of Shipment. Many of these documents are covered by international conventions that impose internationally binding obligations and conditions and are often enforceable by national laws and regulations. Some of these conventions still mandate a signed document to perform a particular function in the transport, transit or logistics chain. However, many more conventions have adopted a more modern, simpler approach by removing the requirement for a manual signature and replacing it with an electronic equivalent or another method of authentication[6]. Consequently the domestic and international transport chains are increasingly demonstrating the tendency that the requirement for a signature is not necessary.

30. Financial documents can include insurance policy or certificate, bank transfer, specific bank documentary provisions of the credit or collection, and bills of exchange. The same considerations would largely apply as with transport documents. Many of these documents have already been replaced by automated processes that relate to relationships between the financial institutions. Some financial documents, most notably bills of exchange are negotiable instruments, where form and signature requirements are well established. However this does not preclude actions to remove these requirements and replace them with more modern, simpler methods or authentication.

31. Official documents can include customs export declarations, import entries, import certificates, agricultural certificates, CITES (Convention for the International Trade in Endangered Species) certificates, and other documents required to establish admissibility and accountability. The acceptance and responsibility to meet official and regulatory demands often occurs at import in the country of final destination. However, meeting these requirements often has a direct bearing on action in the country of export before or at the time of dispatch, or subsequently.

[6] UNCITRAL has on-going work on this subject. See, among other references, the 47th Session Working Group at http://www.uncitral.org/uncitral/en/commission/working_groups/4Electronic_Commerce.html (as of 1 July 2013) and the draft model terms is A/CN.9/WG.IV/WP.122.

### C. Determining the needs of authentication in the context of a transaction

32. For transactions with government authorities, it is recommended that a joint public and private sector working party (or sector-specific working parties) be established in order to perform a regular review of the documentation used for domestic and cross border trade. The goal of the working party would be to eliminate the manual-ink signature whenever possible and either eliminate its necessity completely, if this is safe and reasonable in the context of the transaction, or replace it with other authentication methods. A list of considerations is proposed in Annex B.1.

33. For business to business transactions, the two parties can likewise study the needs of authentication in the context of individual transactions or make reference to a transversal agreement. The list of considerations proposed in Annex B.1 should also provide guidance in this context.

## IV. Use of electronic authentication methods

34. The choice of other authentication methods will depend on the business process and a risk assessment of the needs of that process. A list of considerations when choosing an electronic authentication method is proposed in Annex B.1.

### A. Technology neutrality

35. In so far as possible, legislation should remain technology neutral; it should not discriminate between forms of technology. Technological guidance, when provided, should be based on minimal requirements perhaps with examples, but with the possibility of responding to these requirements with other solutions which would be functionally equivalent.

### B. Levels of reliability

36. As described above, depending on the relationship between the parties and the context of the legal environment, some processes may require more or less security. Not every transaction needs to be the highest level of security. Likewise, technological methods vary and may provide more or less security as required.

37. The chosen method of authentication should be “as reliable as was appropriate for the purpose for which the data message was generated or communicated, in the light of all the circumstances, including any relevant agreement.”[7]

38. Efforts should be made to avoid creating electronic solutions which are more cumbersome or costly than the manual process. Technology can provide implementations with very high levels of reliability. Implementation choice should be in line with the level of reliability required by the process and existing legal constraints.

[7] Article 7.1, UNCITRAL “Model Law on Electronic Commerce with Guide to Enactment 1996 with additional article 5 bis as adopted in 1998” United Nations, New York, 1999, p.5-6. Available as of March 2013 at http://www.uncitral.org/uncitral/en/uncitral_texts/electronic_commerce/1996Model.html.

## C. Typologies of electronic authentication methods

39. A number of alternative methods exist that can replace a manual-ink signature. Technology is constantly evolving. Illicit or fraudulent activity is also constantly evolving, finding ways to undermine the level of reliability that might be placed in some aspects of a given method. For this reason, technical standards and technical implementations are further discussed in Annex B.2 of this Recommendation in order to facilitate its updating to correspond to current best practices and standards.

40. Depending on risks, security needs, and other considerations, an authentication method used alone ("single factor authentication") may suffice. In high-risk situations however, an appropriate combination of authentication methods and other techniques may be needed ("multi-factor authentication"). For example, a registration and verification process may be based on an ID/Password for identification accompanied by a Virtual Private Network (VPN) or other electronic method.

## D. Electronic signature

41. Almost without exception, all of these methods can generally be referred to as an electronic signature. An electronic signature can be defined as “data in electronic form in, affixed to or logically associated with, a data message, which may be used to identify the signatory in relation to the data message and to indicate the signatory's intention in respect of the information contained in the data message.”[8]

42. It should be noted that an electronic signature in this broad sense does not inherently call for a specific form of technology. An electronic signature will serve the same functions as a manual-ink signature, again on a sliding scale with more or less of each of these functions (that is, identification, evidentiary and attribution).

43. An electronic signature should not be discriminated because of its origin. It should also not be discriminated merely because it is an electronic authentication method. However, it may be discriminated because of its intrinsic qualities. The governments and regulatory authorities of various countries should work towards implementing arrangements like Memorandum of Understanding (MoUs), agreements, etc. for providing legal recognition to electronic signatures of foreign origin and for ensuring inter-operability of electronic signatures.

44. A distinction should be made between “electronic signature” as it is used in this guideline and relevant UNCITRAL texts on electronic commerce and “digital signature” which is addressed in the Annex B of this Recommendation. For the sake of clarity, it is underlined that these two terms are not interchangeable. The generic term, which makes no reference to any technological choice, and used in UNCITRAL texts on electronic commerce, is “electronic signature”. “Digital signature,” as discussed in UNCITRAL documents, implies that a technological choice has been made (for solutions with asymmetrical encryption, Public Key Infrastructure (PKI) signature technology being the main example).[9] Regulators and those drafting contracts or technical documents, should

[8] Cf Article 2a of the UNCITRAL “Model Law on Electronic Signature with Guide to Enactment 2001,”United Nations, New York 2002, page 1. Available as of March 2013 at: http://www.uncitral.org/uncitral/en/uncitral_texts/electronic_commerce/2001Model_signatures.html. Note that the original definition in this 2002 document cites the “signatories’ approval,” Further UNCITRAL work has evolved towards the “signatories’ intention.”

[9] Cf for example paragraph 21, page 15, UNCITRAL “Promoting Confidence in Electronic Commerce: Legal Issues on International Use of Electronic Authentication and Signature Methods, (cont’d of footnote 9, page 9)” United Nations, Vienna 2009. Available as of March 2013 at http://www.uncitral.org/pdf/english/texts/electcom/08-55698_Ebook.pdf.

bear this distinction in mind and use the term “electronic signature” unless they intend to imply such a technological choice has been made.

# V. Aspects for consideration of electronic authentication methods

45. These are some aspects that should be considered depending on the chosen methods of authentication.

## A. Use of third party services

46. The parties may prefer or need to call upon a third party to perform any aspect of transmission, archival, retrieval, verification, etc., involved in the authentication method. In some cases, third party services are mandated or validated by a government authority (issuing encryption keys, for example). In some cases, third party services offers options to trading partners for full plug-and-play solutions, data compilation and transmission services, enhancement of security, archiving/retrieval services, etc.

47. In a very general sense, authorization to use a third party service should be granted by either trading partner. In this case, the third party service would be considered an ‘intended party’/‘authorized party’ in the transaction process. Any limitations to this authorization or the possibility to use a third party service should be clearly outlined in the appropriate legal text, the bilateral agreement between trading partners or agreements with the third party services.

48. Where third party services are mandated or validated by a government authority, the requirements to become mandated should be transparent and the process should be open to all.

## B. Security of data

49. Access to the data should be limited to the intended parties (authorized parties). This can in part be determined by the legal responsibilities of the parties involved.

50. The requirements of the security of the data will correspond with the level of reliability required by the transaction which should have been determined by a risk assessment considering the process, the operational constraints, the legal constraints and the relationship of trust between the parties. If a trusted third party is acting within the process, they should ensure this same level of reliability. Depending on the determined level of reliability, parties’ interests in the event of litigation should be protected.

51. Depending on the level of reliability, security of the data may encompass ensuring protection and ensuring that data is not deleted or destroyed.

## C. Transmission of data

52. The aspects of the actual transmission of data will depend on the electronic method chosen. These are presented in the Annex B of this Recommendation.

53. For private business to business exchanges, the two parties should explicitly agree on the method of communication and the method of authentication. They should consider the level of reliability required when establishing this agreement. This could, for example, be part of an Interchange Agreement between the two parties as per the model of

UN/CEFACT Recommendation 26. This could also be covered in a transversal agreement established by an authority.

54. Depending on the level of reliability, an audit trail may be necessary. In some cases it may be useful or legally necessary to obtain confirmation of transmission / confirmation of receipt, ensuring the order of messages, time stamp, the various headers, etc. This may be required under certain trading partner agreements or in a particular legal context.[10]

## D. Archiving / retrieval

55. In most cases, trade documents will need to be archived either for later use for other processes, for a trace of the operations, etc., or in order to respond to legal obligations or regulatory requirements (for example the legal requirements to archive electronic invoices or customs declarations). When considering the archiving of trade documents, the party should consider the archiving period, archiving place, and access control. Authentication method for archiving documents could be very different depending on long-term archiving or short-term archiving. Documents archived for long periods may require special attention, as existing authentication methods commonly weaken or even become obsolete over time due to new technologies. Governments or bilateral agreements may want to foresee migration from one technology to another during archiving.

56. Depending on the needs of the transaction, archiving methods may be expected to correspond to at least an equivalent level of reliability as the authentication/signature method used. The method of archiving should be auditable; in other words, it must be possible to check its reliability to see whether it works or not, to check the correctness of retrieved data and its readability (format used), and to verify that it encompasses the functional aspects of an authentication which is being accepted between the parties and authorities.

57. The trading partners may wish to call upon a third party service to assist in archival and retrieval of the data; this may be dependent on many factors including technological capabilities and costs. In this case, the third party services should take into consideration the above points. Third party solutions may also have the possibility to issue a certificate with legal effect proving that an authorized party retrieved the data and when it was retrieved, if the level of reliability calls for such provisions.[11]

# VI. Recommendation Review Process

58. The present Recommendation is divided into the Recommendation text, guidelines and Annexes (which include Repositories). It is suggested that the Annexes and Repositories are updated every three to five years. This will entail contacting each initial contributor to verify that the information is still pertinent / up-to-date (absence of a response should result in the elimination of the submission from the Annex). Following the response from the contributor, the information in the Annex should be confirmed, revised or eliminated as the case may be. This will also be an opportunity to request new submissions for the Annexes and integrating any other contributions.

[10] In this regard, reference may be made to article 15 of the UNCITRAL Model Law on Electronic Commerce and article 10 of the Electronic Communication Convention which provides rules on the time and place of dispatch and receipt of data messages.

[11] In this context, reference may be made to article 10 of the UNCITRAL Model Law on Electronic Commerce which provides a rule on retention of data messages.

59. Once all of the Annexes and Repositories have been updated, it is suggested that the content of the Recommendation and its Guidelines be verified against the revised Annexes. If there are no (or very minor) modifications, it may be best not to update the Recommendation in the interest of trying to keep a stable version. If there are elements from the Annexes and Repositories which contradict or render the Recommendation text obsolete / erroneous the Recommendation should be modified.

60. Similarly, if Governments or Trade bring substantive concerns to light as to the pertinence of the text of the Recommendation, this should be considered for purposes of text revision even outside of the updating periods.

# VII. Options other than a manual-ink signature

61. This chapter aims to bring further precision to the three main recommendations of this document.

## A. Removal of manual-ink signatures and their electronic equivalent when possible

62. It is recommended that Governments and all organizations concerned with the facilitation of international trade procedures examine current trade documents to identify those where manual-ink signatures and their electronic equivalent could safely be eliminated and to mount an extensive program of education and training in order to introduce the necessary changes in commercial practices.

63. This removal of the requirements for a signature should be studied on a case-by-case basis for each given commercial document. Where signature is not essential for the function of the document or the transaction, then it is recommended that these requirements be removed.

64. Furthermore, when creating new trading environments or documents, it is recommended to naturally refrain from introducing requirements for signatures in new regulations, rulings, contracts or practices.

## B. Enabling electronic methods of replacing a manual-ink signature

65. It is recommended to governments and international organizations responsible for relevant intergovernmental agreements to study national and international texts which embody requirements for signature on documents needed in international trade and to give consideration to amending such provisions, where necessary, so that the information which the documents contain may be prepared and transmitted by electronic means.

66. Amending the relevant provisions in every legal text where a signature is mentioned is not feasible given the very high number of occurrences. In order to resolve this at the national level, it is recommended to adopt legislation establishing functional equivalence between electronic and paper-based signatures such as that based on the UNCITRAL Model Law on electronic commerce and on the UNCITRAL Model Law on electronic signatures. This blanket provision would reinterpret any reference to signature or authentication as meaning the possibility to allow for their functional electronic equivalent. At the international level, the same result may be achieved with the adoption of the United Nations Convention on the Use of Electronic Communications in International Contracts,

2005 (article 9(3)).[12] Since the Convention applies to international transactions only, it is also recommended to create a concurrent legal text for domestic transactions with such a blanket provision which would reinterpret any reference to signature or authentication as encompassing their functional electronic equivalent.

67. It is suggested that the paper-based process be identified and that this process be detailed step-by-step. Risk-assessment should be a guiding principle, considering the context of the transaction/service, the legal constraints, the operational constraints, etc. Parties should be permitted and encouraged to fulfill functional requirements of a manual-ink signature by using other methods.

## C. Creation of legal framework

68. Examples of legally enabling environments are provided in Annex A. The operational capability of replacing a manual-ink signature by an electronic method must be accompanied by appropriate legislation which gives equal status to those authentication methods. This legal framework should foresee the acceptability in court of alternative transmission methods and archiving processes. Two main aspects may need to be addressed either jointly or separately: the legal framework for private-sector operations and the legal framework for operations between the private sector and government agencies.

69. Concerning operations between private businesses and between business and consumers, governments should undertake a study (including e-Commerce legal benchmarking and "gap analysis" studies) to determine an appropriate set of measures that may need to be taken to address legal issues related to authentication of national and cross-border exchange of trade data.

70. Concerning operations between business and government agencies, the government, at the highest level, must first provide the legislative mandate for agencies to provide the option for electronic maintenance, submission, or disclosure of information, when practicable as a substitute for paper. As part of this mandate, the government should, in consultation with other agencies and the private sector, develop practical guidance on the legal considerations related to agency use of electronic filing and record keeping so that the agency can in return, make the appropriate assessment for its mission. Consideration should be given by the agency on how to design the process to protect the agency's legal rights and how best to minimize legal risks to the agency.

71. Government should, when possible, provide guidance to the private community on this issue. Any guidance provided by the Government and/or the specific agency should also take into consideration current legal requirements pertaining to the use, storage and disclosure of information, and its use as evidence in courts or administrative bodies.

72. The legislative frameworks should be reviewed regularly in order to correspond to actual business practices. Public law should aim, whenever possible, to align with current way of doing business and with current best practices and standards.

[12] "United Nations Convention on the use of Electronic Communications in International Contracts" (Electronic Communications Convention [ECC]) United Nations, New York, 2007. In force since March 2013. Available as of March 2013 at: http://www.uncitral.org/pdf/english/texts/electcom/06-57452_Ebook.pdf

# Annex A.1

# Legally enabling environment

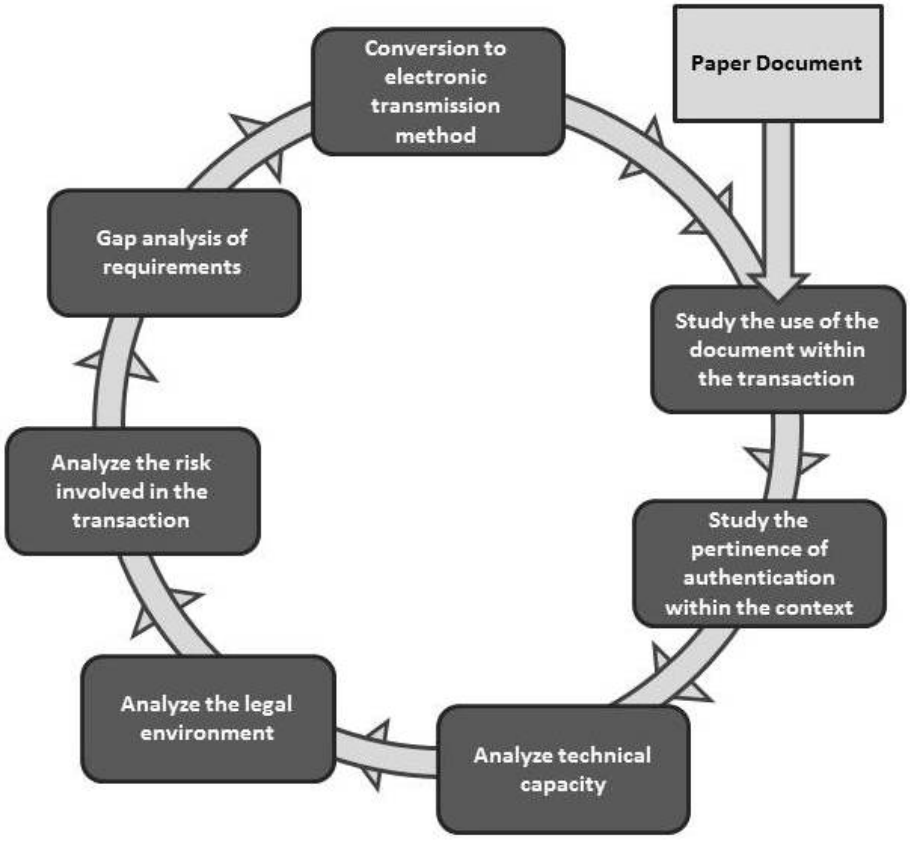
| | Recommended checklist for government agencies when reviewing their legal environment |
|---|---|
| ✓ | Compliance with applicable laws and regulations? |
| ✓ | Compliance under confidentiality laws? |
| ✓ | Comprehensive plan to address all issues raised by moving to an electronic system? |
| ✓ | Consultation with impacted parties, including other relevant offices and agencies? |
| ✓ | Is any information used in the process required by law or regulation to be in a particular form, paper or otherwise? If part of the process is paper, how will this be satisfied? |
| ✓ | Is there a legal requirement or an agency need to maintain the information? And if so, for how long? |
| ✓ | Is the information of importance to national security, public health or safety, public welfare, the protection of the environment, or other important public purposes? |
| ✓ | Is there impact to the public if this information is not available? |
| ✓ | What is the importance of the information to the agency's mission/ programs? |
| ✓ | Is there a revenue impact to the agency? |
| ✓ | Might the information be needed for use in criminal proceedings or other legal proceedings? |

# Annex A.2

## Virtuous circle for the review of trade documents

1. To achieve the objective of removing the requirement for a signature on trade documents, or where that is not immediately possible, to consider other methods of authentication, Recommendation 14 recommends a regular review of the documents used in domestic and cross border trade. The review would be conducted by a joint public and private sector working party to ensure that the regulatory and official requirements and the business needs of the trading community are fully considered in an open, transparent and inclusive way.

2. The suggested methodology of the working party is shown in the figure below:




Figur e 1

3. The 'virtuous circle' diagram envisages a rolling programme of review for all documents used in domestic and international trade conducted every three to five years. For ease of conducting the programme and utilizing the expertise of the participants in the working party, the documents should be divided into specific functional groups, for example Commercial, Transport, Financial (including international payments) and Official. The suggested divisions are indicative and not exhaustive.

4. A schedule or calendar for the document groups should be agreed by an oversight or supervisory committee to ensure consistency of methodology and outputs from each group. Adopting this approach should make the review programme manageable, efficient and effective. Equally a structured programme should reduce the time and burdens on participants of the individual review groups.

5. The outcome from the rolling programme would be an action plan to remove the requirement for a signature from a significant number of trade documents. Where this is not immediately possible the action plan should offer imaginative and innovative ways of replacement by other authentication methods. In this respect the members of the review groups should embrace the concept of simpler, easier trade processes through radical yet well informed and considered solutions.

6. If, or when adopting the concept of a Virtuous Circle review program, the working party would need to consider certain pre-requisites to ensure the review is successful. First and foremost would be the technical capacity of both government and the business community to implement any proposed action plan. The working party would need to ascertain the ability of government to receive, share (among authorities and regulatory agencies), store and retrieve data, and be able to accept and process other forms of authentication.

7. For the business community, especially the small and medium size enterprise sector, the working party would need to determine traders have the ability to generate, receive and process standard electronic data messages. Business should also demonstrate the ability to maintain the electronic information for any government audit based controls using company systems and commercial records. Equally important for the assessment of capacity is to ensure business law will allow other forms of authentication other than signature to commit the trading partners to the performance of the contracts in the trade transaction.

# Annex A.3

## Trade documents standards package

8. UN/CEFACT provides a suite of products that offer recommendations, guidance, advice and good practices for the design, preparation and presentation (including electronic submission) of trade documents used in domestic and cross-border Trade. Recommendation 14 is one of the instruments in this suite of products and the diagram below, figure 2, gives a graphical representation of its related position in the integrated package of standards for trade documents.

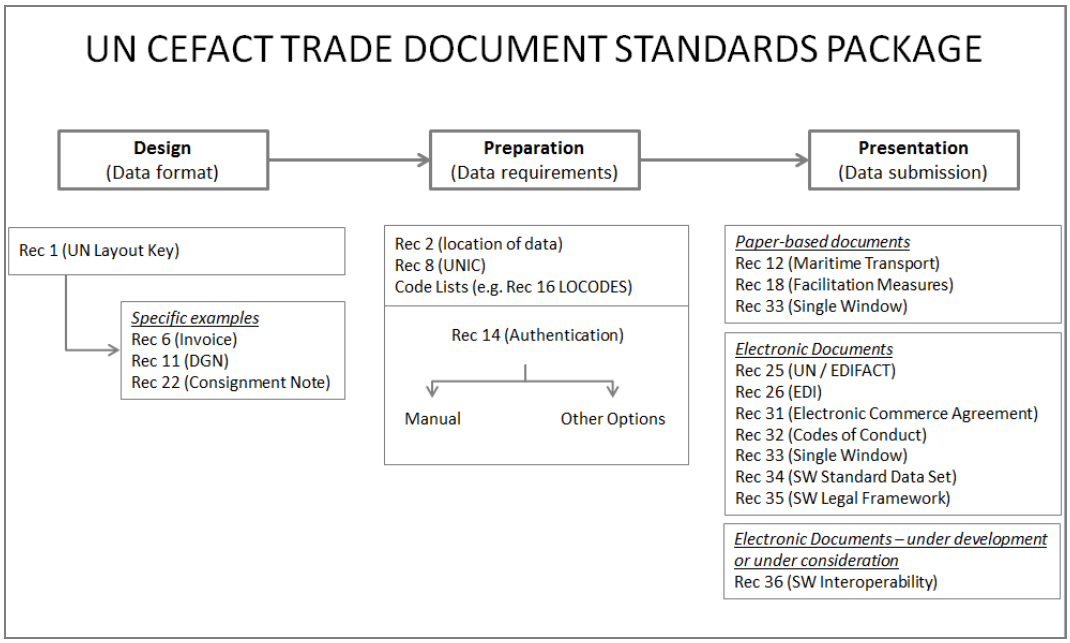



Figure 2

# Annex B.1

## Technical implementations

## Checklist of considerations to determine the needs of authentication in the context of a given transaction

The following key points should be taken into consideration when determining the needs of authentication. This list should be applicable to transactions with government authorities as well as business to business transactions.

**Context considerations**

- ✓ Is a signature required at all to authenticate the trade document?
- ✓ Is an electronic transmission of the document suitable?
- ✓ Kind of transaction;
- ✓ Volume (number of individual) of transactions;
- ✓ Value of the transaction;
- ✓ Number of signatories per individual transaction;
- ✓ Frequency at which the trade transactions take place;
- ✓ Nature of the trade activity (who are the parties, the sector of activity);
- ✓ Cost and benefits;
- ✓ Compliance with trade customs and practice.

**Technological considerations**

- ✓ System and equipment capabilities and their possible interaction (hardware/software);
- ✓ When using an intermediary, the authentication procedures made available and set forth by them (audit procedure?);
- ✓ What are the potential threats / risks / vulnerabilities to attacks?
- ✓ What are the strengths of each alternative authentication method?
- ✓ Compatibility issues of authentication methods;
- ✓ Analysis of existing technology and usability of that technology for purposes of data retention and/or future access.

**Legal considerations**

- ✓ Legal context (national [local, federal…], regional, international, sectorial, jurisprudence, private law… as described above in point 3a);
- ✓ Adherence to the UNCITRAL Model Law on Electronic Commerce or Electronic Signature which enable mutual recognition of authentication methods;
- ✓ International agreements / bilateral or multilateral mutual recognitions (for example recognition of standards, financial arrangements, interoperability issues, etc.);
- ✓ Awareness of legal concerns and/or regulatory restrictions in each trading parties' environment;
- ✓ Does the transaction require legal validity or is the authentication merely for enhancing security?
- ✓ The existence of insurance coverage mechanisms against unauthorized communications.

**Relationship considerations**

- ✓ Determination of the level of protection needed and the potential of risk of liability for the agency / trading party
- ✓ Importance and the value of the information contained in the electronic communication

- ✓ Degree of acceptance or non-acceptance of the method of identification in the relevant industry or field both at the time the method was agreed upon and the time when the electronic communication was communicated
- ✓ Relationship between the trading parties (trust, etc.)

# Annex B.2

# Typologies of means of electronic authentication

The different typologies of electronic equivalents to a manual-ink signature can include (this is a non-exhaustive list, presented alphabetically in order to underline that there is no promotion intended in any of these methods):

**Biometric methods**

- "A biometric is a measurement used to identify an individual through his or her intrinsic physical or behavioral traits. Traits that may be used for recognition in biometrics include DNA; fingerprints; iris, retina, hand or facial geometry; facial thermogram; ear shape; voice; body odor; blood vessel patterns; handwriting; gait; and typing patterns." (UNICTRAL Promoting Confidence op.cit. §53).
- The biometric measurement may be unique, but there may be other forms of system challenges such as ensuring that a given fingerprint (for example) belongs to a specific person.

**Clickable "OK" or "I accept" boxes**

- Clicking an "OK" or "I accept" box.
- This will often be coupled with another identification process such as payment by a credit card (for payment) or an ID/Password. Even accepting a license with an "I accept" box will be followed by installing software (for example).

**Communication network**

- Identification by means of participating in a network. This can be within a larger multi-partite network (such as ODETTE in the automobile industry or SWIFT). This can also be point to point (such as a Virtual Private Network – VPN between two points of access)
- This is often accompanied by another typology such as ID/Password.

**Devices (authentication with a mobile phone, for example)**

- Identification of the device using a technology such as text messages (receiving a validation code or sending a message when crossing the border).
- The individual will need to be associated in some way to the device.

**Digital signatures**

- "Digital signature" is a name for technological applications using asymmetric cryptography, also referred to as public key encryption systems that ensure the authenticity of electronic messages and guarantee the integrity of the contents of these messages. The digital signature has many different appearances, such as fail stop digital signatures, blind signatures and undeniable digital signatures.

- One consideration will be building the infrastructure to put in place and maintain the certification process.

**ID/Password**

- Passwords and codes are used both for controlling access to information or services and for "signing" electronic communications. In practice, the latter use is less frequent than the former because of the risk of compromising the code if it is transmitted in non-encrypted messages. Passwords and codes are however the most widely used method of "authentication" for purposes of access control and identity verification in a broad range of transactions, including most Internet banking transactions, cash withdrawals at automated teller machines and consumer credit card transactions. (UNCITRAL Confidence op.cit. §63)

**Image of a signature**

- A manual signature which is scanned or sent via facsimile. It can be an entire document that has been manually signed and which is scanned / faxed. This can also be an image of a signature or a scanned signature which is then attached to the document afterwards.

**PGP (Pretty Good Privacy)**

- "Pretty Good Privacy" (PGP) is a software to protect information based in two keys. The first one is a public-key cryptography to encrypt the information which is collected ignoring any personal identification. The second one is the decrypt key, which is a private code only known by the owner to recover the encrypted information.

**Seals (company seal)**

- A digital signature which applies to a company as opposed to an individual.

**Signatures on pads**

- Manually signing a tactical screen device.

**Signature on file**

- Signing an agreement with a partner which (for example a travel agency) allows for the ability to telephone or email the partner to purchase products/services with the method of payment that they have on file.

**"Something I know"**

- Verification of identity by responding to a question or providing information that only the individual would know.

**Structural agreement enabling electronic data exchange with no authentication**

- Signing a one-time paper contract which enables electronic data exchange (IATA eAWB).

**Third-party validation**

- An example includes identification of the issuing party of a document which is validated by a third party.

**Typed signatures**

- Typing in the issuing party's name at the end of a document – an email for example (this is often checked within the context of the transaction – in this example, it can be counter-checked by the sender of the email).