Data Harmonization towards Single Window Paperless Environment

APEC Electronic Commerce Steering Group

APEC Committee on Trade and Investment

September 2009

Final Report

Project Background

1. APEC Project on Data Harmonization towards Single Window Paperless Environment (APEC ECSG 05/2008T) was endorsed in 2008 for implementation and funding by APEC Electronic Commerce Steering Group (APEC ECSG). It was co-sponsored by Thailand, People Republic of China, and Chinese Taipei.

2. The project aims to achieve these objectives:
    a. to promote the development of information framework for Single Window based on early ratifications made by World Customs Organization (WCO) and United Nations Centre for Trade Facilitation and e-Business (UN/CEFACT), as well as the incorporation of data requirements from the Asia-Pacific region;
    b. to facilitate APEC member economies and enhance their capacity in document simplification and data harmonization, and standardized data set development at both economy and regional levels;
    c. to reinforce the adaptation of internationally accepted standards essential for the development of interoperable Single Windows proof-of-concept demonstration

3. In order to meet those objectives, the project conducts the following principal activities:
    a. Elicitation of data requirements from some APEC member economies to support the development of holistic data model for cross border data exchange
    b. Demonstration of proof-of-concept
    c. Development of a User Guide for Data Harmonization and Electronic Message Assemble
    d. Organization of back-to-back policy-level symposium and technical workshop
    e. Establishment of internet-based resource portal to disseminate the process of data harmonization among APEC member economies

4. The project has been implemented for these following 5 deliverables:
    a. Data requirements analysis and modeling with the draft Buy-Ship-Pay UN/CEFACT Project document
    b. Reference on Data Harmonization and Core Component-based Electronic Message Development
    c. A set of digital paper documents using the United Nations Trade Documents Toolkit and accompanying XML schemas
    d. Two-day Symposium (19-20 Jan. 2009; Bangkok) on Single Window Paperless Trade Environment Challenges, particularly on Data Harmonization Development and five-day Train-the-Trainer Workshop (19-23 Jan. 2009; Bangkok)
    e. Web portal for the dissemination of project output (www.apec-dh.org)

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5. The project takes into account the latest development in intentional standard setting in the United Nations, ISO and also WCO. The following documents developed by UN/CEFACT provide a basis for semantic interoperability:
    - Trade Data Elements Directory (UNTDED 2005, ISO 7372:2005) which sets standard definition to data elements used in the international supply chain;
    - UN/CEFACT Core Component Technical Specification (CCTS: ISO 15000-5/ebXML) which provides the methodology for the identification of dictionary entry

names (data elements) in the information model and the development of an information model that in turn defines the structure of an electronic message;

- UN/CEFACT Core Component Library (CCL) which is a repository of reusable CCTS-compliant dictionary entry names; and
- UN/CEFACT XML Naming and Design Rules which provides a methodology for the transformation of the defined information model into XML schema.

6. To achieve the data requirements analysis and modeling with the Buy-Ship-Pay draft project document, the data requirements have been collected from the following documents of some APEC member economies:
    - ASYCUDA Data Set Corresponding to Version 2.0 of the WCO Customs Data
    - Chinese Taipei's Export Declaration
    - Chinese Taipei's Import Declaration
    - Thailand's Export Declaration
    - Chinese Taipei's Cargo Report for Export
    - Chinese Taipei's Cargo Report for Import
    - Thailand's Air Cargo Manifest
    - Thailand's Sea Cargo Manifest
    - Thailand's Car Cargo Manifest
    - North American Free Trade Agreement Certificate of Origin
    - ASEAN Preferential Certificate of Origin (CEPT Form D)
    - ASEAN-China Free Trade Area Preferential Tariff Certificate of Origin (Form E)
    - Generalized System of Preferences Certificate of Origin (Form A)
    - Canada's Veterinary Health Certificate Export of (Processed) Porcine Blood Products to China
    - Australia's Animal and Public Health Certificate for the Importation of Meat and Meat Products from the Equine, Bovine, Ovine, Caprine and Porcine Species
    - New Zealand's Health Certificate for the import of fresh meat and meat products into the European Union
    - Health Certificate for Fishery and aquaculture products originating in Thailand
    - International Plant Protection Convention (IPPC), International Standards for Phytosanitary Measures (ISPM) No. 12 on Guidelines for Phytosanitary Certificates
    - Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

As observed that the UNeDocs project document covers data requirements of stakeholders from government and business sectors across the international supply chain in addition to customs' data requirements and provides sufficient data coverage for the establishment of semantic interoperability among Single Windows, those collected data requirements have been, hence, experimentally mapped with the draft UNeDocs in order to verify if it meets business requirements and is applicable for practical implementation purposes. As a result, there are still data requirements that are not currently covered by the draft UNeDocs. Therefore, a process such as the incorporation of those missing data requirements into the data model might be considered to proceed, however, with consultation of concerned parties.

7. Regarding the development of a user guide, the Reference for Data Harmonization and Core Component-based Electronic Message Development was created (as appeared in Annex 1). It was reviewed by the experts of TBG2, TBG14, and TBG17 of UN/CEFATCT and several project managers of large international data harmonization

projects (e.g. the projects for Exporting Wine from Australia to EU, Thailand Data Harmonization Project etc.). These experts provided positive feedbacks on the Reference, particularly its quality and value to their related work. It was, therefore, used as a training material for the technical training workshop on BSP Data Modeling during 19-23 January 2009. It outlines the step-by-step approach to help data modelers harmonize data element names and also the structure of trade, transport, and administrative documents exchanged across an international supply chain with the reference data model. The Reference can be summarized into four steps as follow:

> Step 1: Capture business processes to identify documents in the information flow
> Step 2: Define each data elements extracted from each document in terms of definition, data type, data format, and data constraints in actual operation
> Step 3: Analyze data elements across various documents and organize them in a comparable manner
> Step 4: Map the data elements to the draft Buy-Ship-Pay UN/CEFACT Project document

8. Instead of December 2008, the APEC Symposium and Train-the–Trainer Workshop on Data Harmonization towards Single Window Paperless Environment was rescheduled to take place in January 2009, due to the difficult situation in Thailand. The APEC Symposium on Data Harmonization towards Single Window Paperless Environment was, then, successfully held on 19-20 January 2009 in parallel with Train-the-Trainer Workshop on Data Harmonization on 19-23 January 2009 in Bangkok. They were hosted by Institute for Information Technology Innovation, Kasetsart University, with the support by Department of Business Development under Ministry of Commerce and by Ministry of Information and Communication Technology, Thailand.

9. There were totally 18 representatives from public and private sectors actively participating as speakers and moderators in the Symposium and also as trainers in the Workshop. They are representatives from 7 APEC member economies (Australia; Hong Kong. China; Republic of Korea; Malaysia; Chinese Taipei; Thailand; USA), 4 non-APEC member economies (Germany, India, Ireland, U.K.), and 4 international organizations (IATA, UNESCAP, UNECE, and WCO ROCB).

10. There were approximately 80 participants from 11 APEC member economies (Chile; Indonesia; Malaysia; Mexico; Peru; the Philippines; Russia; Singapore; Chinese Taipei Thailand; Viet Nam) attending the Symposium. They were representatives from Government and business organizations concerning Plant Agriculture, Livestock, Fisheries, Customs, Transport, Foreign Trade, Port Authority, Logistics Services, Science and Technology, ICT Policy and Development, Software Development, IT Consultants, Import and Export, Bank, and Academia.

11. The 2-day Symposium contained the sessions of Policy Discussion; Showcases and Experience Sharing; Applications and Possible Solutions; and Discussion on Way Forwards for Data Harmonization Development and Implementation in the Asia and Pacific region.

12. The final output of the Symposium is the Recommendations on Data Harmonization issues towards Single Window Paperless Environment that were mutually agreed among all active participants (as appeared in Annex 2). The recommendations are intended to contribute to the development of APEC Data Harmonization Roadmap.

13. The 5-day Train-the-Trainer Workshop was organized on 19-23 January 2009 with the Reference for Data Harmonization and Core Component-based Electronic Message

Development as a primary training material. There are 24 participants from 8 member economies and 1 international organization (Chile, Chinese Taipei, Indonesia, Malaysia, Peru, Philippines, Vietnam, Thailand, and CITES Secretariat, United Nations Environment Program). The workshop provided extensive knowledge on:

- Data Harmonization Process
- UN/CEFACT Core Component Specification (CCTS) with an emphasis on the principle of CCTS objects and their relationship as well as CCTS Naming Convention which is also in line with ISO 11179 for data element naming and defining
- Buy-Ship-Pay UN/CEFACT current draft project document and the Business Information Masters (BIMs)
- Electronic message assembly
- XML schema development in accordance with UN/CEFACT XML Naming and Design Rules

In addition to the classical training, the participants were also exposed to the hands-on data harmonization exercise and data model application both manually and with a sample software tool.

According to the feedback from the participants, the need for data harmonization can be contextualized to the individual needs of the participants. It is claimed that the contextualization of this complicated subject to individual needs assisted greatly in better understanding the full impact of the drive towards the single window environment. The proof of concept based on the United Nations Trade Documents Toolkit was demonstrated on the last day of the workshop to show how electronic documents and paper documents co-exist.

14. The Training Workshop has successfully built a number of data modelers who consequently demonstrate their capabilities of associating data requirements with their equivalence in Buy-Ship-Pay UN/CEFACT current draft.

    The participants are oriented that they contribute to the data harmonization projects not only in their economies but also to the United Nations Network of Experts (UN NExT) as initiated by UNESCAP in cooperation with UNECE with the aim to promote collaborative efforts in international data harmonization. The contribution can be in various forms such as a peer-to-peer support and a participation in capacity building activities.

15. Lastly, the web site http://www.apec-dh.org has been launched as a channel to disseminate the project outputs and materials. It could be further developed as a portal for exchange of ideas and experiences as well as to provide a virtual working environment for regional expert group.

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3 September 2009

Reference for Data Harmonization and Core-Component-Based Electronic Message Development

APEC Project on Data Harmonization
Towards Single Window Paperless Environment
(APEC ECSG 05/2008T)

APEC Electronic Commerce Steering Group

September 3, 2009

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1. Purpose and Scope of this Document

This Reference is developed with the intention to provide an example of data harmonization and electronic message assemble. As its characteristics of covering data requirements of stakeholders from government and business sectors across the international supply chain and its provision of sufficient data coverage for the establishment of semantic interoperability among Single Windows are observed, UNeDocs is; therefore, referred to in this Reference document for hands-on practice of data harmonization and core-component-based electronic message development. However, it is not endorsed herewith for the completeness or usefulness of any information contained and process disclosed. This concept is also applied to an example software used as a modeling tool for the purpose of actual training practice.

The Reference for Data Harmonization and Core-Component-Based Electronic Message Development is based on a User Guide developed by the United Nations Economic Commission for Europe (UNECE) for the UNECE-UN/ESCAP Workshop for Single Windows in Bangkok 2007[1]. It extends and complements the UN/ESCAP Business Process Analysis Handbook for Document Simplification and Automation[2]. This Reference is provided as a capacity building instrument for the UN Network of Experts for Paperless Trade (UN NExT). UN NExT has been set up by UNECE and UNESCAP to generate the technical expertise needed to implement paperless trade in Asia and the Pacific region.

The Reference seeks to help data modelers harmonize data element names and the structure of trade, transport, and administrative documents exchanged across the international supply chain with the reference data model. The step-by-step approach explained in this Reference demonstrates how to create a data model to specify the structure and properties of a particular document. This data model then serves as a basis for message schema development.

The steps described in this Reference are based on the experience gained from implementing the following projects:
- The pilot exchange of CEPT Form D[3] (ASEAN Common Effective Preferential Tariff / ASEAN Industrial Cooperation Scheme Certificate of Origin) between Thailand and the Philippines; and
- Data harmonization exercises carried out in preparation for the development of Thailand's Single Window e-Logistics.

These projects have simplified and made trade documents ready for automation. Thailand's experience was positive. For example, Thailand harmonized 57 transport-related documents and reduced the total number of 1,346 data elements to 210 by using UNeDocs. The initiative has; therefore, been expanded to cover additional documents from government agencies involved in the administration of international trade.

Standards for electronic business are developed in a highly dynamic environment. If not noted otherwise, this document reflects the state of development until the 3rd quarter of 2008.

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[1] http://www.unece.org/trade/workshop/unedocs-Bangkok_dec07/index.htm
[2] UNESCAP, Business Process Analysis Handbook for Document Simplification and Automation, 2008
[3] http://unece.unog.ch/etrade/doc/pdf/Interactive_form/UNeDocs%20ASEAN%20CEPT%20D.pdf

2. Introduction

Seamless G2G, G2B, B2G, and B2B information exchange both within and across borders has a crucial impact on the efficiency and the security of the international supply chain.

The current state of Internet and web technologies allows information to be exchanged and processed across different information systems. However, it does not guarantee the ability of different information systems to commonly interpret the exchanged information and automatically process it to achieve a desirable business goal.[4] These technologies do not set out semantic rules that govern data element names, their representations and structure. Semantic rules that are industry-specific further complicate data sharing and effective data integration across the international supply chain as they entail different semantic meaning.

XML (eXtensible Markup Language), for example, provides the syntax of the exchanged message. It defines neither message structure nor representation format. XML schemas of an identical message designed by different designers are likely to be different in terms of tags name, their position in the message, their cardinality, or constraints regarding representation formats of informational content.

In response to these challenges, UN/CEFACT, through its International Trade and Business Processes Group on Digital Paper (TBG 2), has developed the data model so-called Buy-Ship-Pay UN/CEFACT Business Standard Subset for International Trade which is previously known as UNeDocs. It intends to assist the alignment of data requirements for paper and electronic information exchange across the international supply chain. This data model is based on the Core Component Technical Specification (CCTS) standard. The semantic rules that UNeDocs provides are contextualized for the automation of documentary requirements across the international supply chain. Their generativity in the meantime allows the application of business rules that may vary depending on stakeholders' needs.

The UNeDocs data model has been developed in accordance with UN/CEFACT Open Development Process (ODP) [5]. Several UN/CEFACT working groups representing different business sectors such as supply chain, transport, and agricultural domain have contributed to this data model to ensure that UNeDocs fulfils data requirements in various stages of the international supply chain and that these data requirements are properly integrated to provide a basis for seamless B2B, B2G, G2B, and G2G information exchange. Projects that participated in the UNeDocs implementation verification stage (ODP Step 6) included a data exchange pilot project between UK and Malaysia, two projects funded by the EU Commission, the United Nations Regional Commissions and regional project hosted by APEC.

UNeDocs has continued to evolve to ensure the inclusion of data requirements associated with the Buy-Ship-Pay model and the alignment with D.08B Core Component Library.

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[4] Stuhec, G., *How to Solve Business Standards Dilemma: The Context-Driven Business Exchange*, SAP Developer Network, 2005
[5] UN/CEFACT, Open Development Process, May 2007, Available at URL: http://www.unece.org/cefact/cf_plenary/plenary07/trd_R650_Rev4_A1E.pdf

The UNeDocs data model offers a generic data model based on international standards that United Nations, ISO and also the WCO have promoted as a basis for semantic interoperability[6]. They include:
– the United Nations Layout Key (UNLK), which promotes the principle of reusable templates for trade documents;
– the Trade Data Elements Directory (UNTDED 2005, ISO 7372:2005), which sets standard definitions for data elements used in the international supply chain;
– the UN/CEFACT Core Component Technical Specification (CCTS: ISO 15000-5/ebXML), which provides the methodology for the identification of dictionary entry names (data elements) in the information model and the development of an information model that in turn defines the structure of an electronic message; and
– the UN/CEFACT Core Component Library (CCL), which is a repository of reusable CCTS-compliant dictionary entry names.

UNeDocs has been used as a building block for the development of information models and Data Model Guides in several projects. Some examples include:
– ASEAN Single Window
– APEC ECSG Pathfinder on Electronic Certificate of Origin
– Secure Trade Lighthouse Priority Project for EU-USA deeper economic integration[7]
– EU-Australia Transatlantic Project on the exportation of wine from Australia to EU
– E-Ten project funded by the European Commission to make available the Single Window for SMEs across Europe

2.1. UNeDocs and Buy-Ship-Pay Model

UNeDocs brings together in an integrated manner data exchange requirements of different parties involved in the international supply chain. UN/CEFACT categorized stakeholders involved in the international supply chain into four groups. They are[8]:
– Supplier [Exporter/Seller] who sells goods or services as stipulated in a sales contract;
– Intermediary who provides commercial, financial, and/or transport services within an international supply chain, such as freight forwarder, customs broker, third party logistics service provider, carrier, express integrator, port, terminal operator, inland container depot, warehouse, bank, insurance companies, and IT value-added service provider;
– Customer [Importer/Buyer] to whom goods and services are sold as stipulated in a sales contract; and
– Authority [of exporting country, importing country, and country in transit] who monitors goods crossing borders in a way that reflects national and international public interests.

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[6] It should be noted that at the time of writing the UNeDocs data model itself is not a standard, rather it is applying existing standards and other work artefacts.
[7] 2007/SCCP/SWWG/WKSP/009 Clearview: An EU Initiative for a Low Cost Single Window Access Model to Ensure Small Business Competitiveness, SCCP Single Window Workshop, Australia, 16-18 April 2007
[8] UN/CEFACT, *Recommendation 18: Facilitation Measures Related to International Trade Procedures*, Geneva, 2001

These stakeholders interact in various stages of the international supply chain from "identifying potential trading partner", "establishing business agreement", and "ordering the goods or services" to "shipping the goods" and "making the financial arrangements".[9] UN/CEFACT has simplified these activities in the international supply chain model called the "Buy-Ship-Pay".

2.2. UNeDocs Business Information Masters and United Nations Layout Key

Because the number of data elements that UNeDocs covers is enormous, those data elements are organized into Business Information Masters (BIMs).
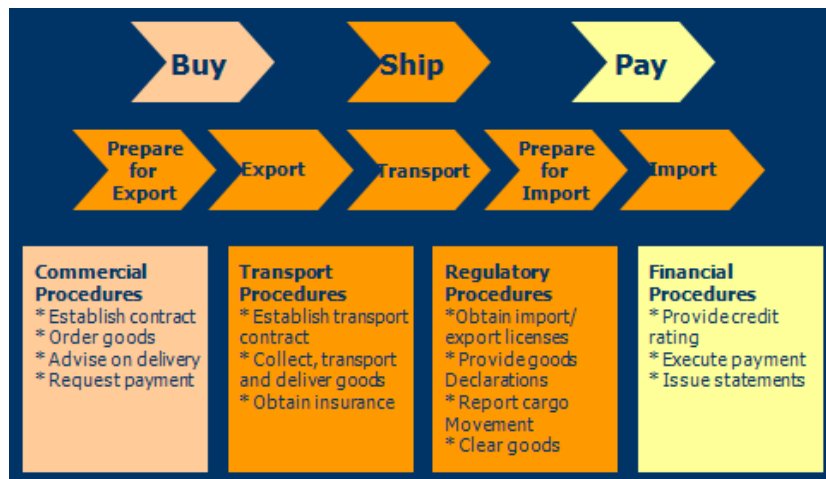

Figure 2.2-1: International Supply Chain Model[10]

The organization of data elements into BIMs is driven by business processes. Each BIM contains data exchange requirements of each key process in the international supply chain model. For example, A "Ship" BIM contains data requirements for all documents exchanged needed to fulfill transport and regulatory requirements as illustrated in Figure 2.2-1 throughout the "ship" process, while the "Buy" BIM is a collection of data elements used in business processes such as ordering and invoicing.

The concept of BIMs as a "reusable template"[11] is very much similar to the concept of document master addressed in UN/CEFACT Recommendation No. 1 on United Nations Layout Key where a master: is "a document prepared for the purpose of producing other documents, by duplicating or copying its data, completely or in relevant parts". [12] According to UNLK document family, documents that are qualified to have the Ship BIM as their data template include those that are categorized as transport and official controls documents. Table 3.2 provides a summary of UNLK document family.

2.3. UNeDocs and UN/CEFACT Core Component Technical Specification (CCTS: ISO 15000-5/ebXML)

UNeDocs data structure is made compliant with the methodology for the identification of dictionary entry names (data elements name) and the construction of an information

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[9] UN/CEFACT, *Towards an Integrated Strategy for UN/CEFACT*, Geneva, May 2006
[10] *Ibid.*
[11] UN/CEFACT TBG 2, *UNeDocs Business Information Masters (BIMs)*, June 2008
[12] UN/CEFACT, *Recommendation 1: United Nations Layout Key*, Geneva, 1981

model as stated in UN/CEFACT Core Component Technical Specification (CCTS: ISO 15000-5/ebXML).

CCTS organizes data elements into two major categories. The first category, so-called "Core Component" (CC), is context-neutral and reusable across various business domains. The second category, so-called "Business Information Entity" (BIE) is basically a contextualized Core Component. One can create a BIE by adding a qualifier term which is context-specific to a selected CC. For example, "Consignment. Details" is a CC. Adding a qualifier term "Cross-Border" makes "Cross-Border_ Consignment. Details" a BIE.

Because UNeDocs is a data model made specific for the international supply chain domain, its data elements fall into the BIE category. The BIEs in UNeDocs are derived from UN/CEFACT Core Component Library which is a repository of standardized CCs and BIEs. By deriving BIEs from the Library, UNeDocs inherits properties of those standardized data elements into the data model. It should also be noted that the definition of some BIEs in UNeDocs can be traced to those in the United Nations Trade Data Elements Directory (UNTDED – ISO 7372:2005) where standard definitions of data elements used in the international supply chain are maintained.
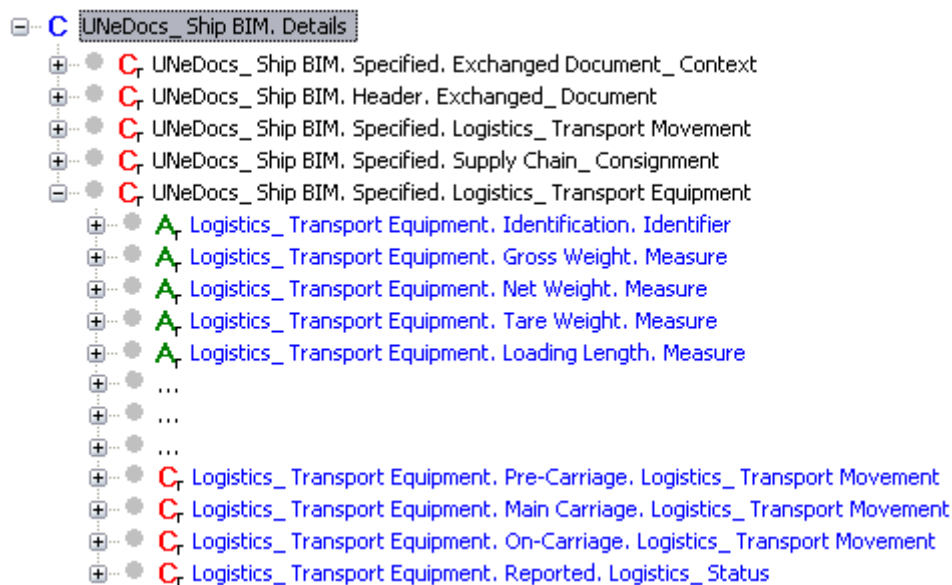
Figure 2.3-1: UNeDocs_ Ship BIM. Details

UNeDocs BIMs are structured in hierarchy. As shown in Figure 2.3-1, UNeDocs_ Ship BIM. Details represents the BIE of the highest order. CCTS refers this type of BIE as Aggregate Business Information Entity (ABIE). ABIE of the "UNeDocs_ Ship BIM" object class contains a collection of simple and complex BIEs that are needed to complete activities related to transport and regulatory procedures. Examples of these activities are shown in Figure 2.2-1. While simple BIE denoted by the green A which is also known as Basic Business Information Entity (BBIE) has only one single property, complex BIE or Association Business Information Entity (ASBIE) denoted by the red C has more than one. ASBIE in fact demonstrates the relationship between two object classes. It can contain both BBIE and other ASBIE.

In this case, the ABIE named "UNeDocs_ Ship BIM. Details" consists of five ASBIEs. They are:

- UNeDocs_ Ship BIM. Specified. Exchanged Document_ Context
- UNeDocs_ Ship BIM. Header. Exchanged_ Document
- UNeDocs_ Ship BIM. Specified. Logistics_ Transport Movement
- UNeDocs_ Ship BIM. Specified. Supply Chain_ Consignment
- UNeDocs_ Ship BIM. Specified. Logistics_ Transport Equipment

"UNeDocs_ Ship BIM. Specified. Logistics_ Transport Equipment", for example, demonstrates the relationship between the "UNeDocs_ Ship BIM" object class and the "Logistics_ Transport Equipment" object class. The ASBIE named "UNeDocs_ Ship BIM. Specified. Logistics_ Transport Equipment" contains both BBIEs and ASBIEs. "Logistics_ Transport Equipment. Identification. Identifier" is an example of BBIE. "Identifier" is known as a representation term. It reflects the nature of the content (data type) for this BBIE. Table 2.3-1 provides examples of data types.

Table 2.3-1: Example of Data Types

Data Type	Description
Amount	A number of monetary units specified in a currency where the unit of the currency is explicit or implied
Code	A character string (letters, figures or symbols) that for brevity and/or language independence may be used to represent or replace a definitive value or text of an Attribute together with relevant supplementary information.
Identifier	A character string to identify and distinguish uniquely, one instance of an object in an identification scheme from all other objects in the same scheme together with relevant supplementary information.
Indicator	A representation of a situation that has exactly two mutually exclusive Boolean values
Measure	A numeric value determined by measuring an object along with the specified unit of measure.
Numeric	Numeric information that is assigned or is determined by calculation, counting, or sequencing. It does not require a unit of quantity or unit of measure.
Quantity	A counted number of non-monetary units possibly including fractions.
Text	A character string (i.e. a finite set of characters) generally in the form of words of a language.
Binary Object	A set of finite-length sequences of binary objects.
Date Time	A particular point in the progression of time together with the relevant supplementary information.

3. Data Modeling with UNeDocs

The modeling of data requirements using the same data building block increases the ability of different information systems to commonly interpret the exchanged data and automatically process them. Data modeling in the context of this document is therefore an act of harmonizing data element names and document structure of documents used by different parties involved in a network of document exchange with a reference data model. Given its comprehensiveness and its compliance with prevailing international-accepted standards for electronic data exchange, UNeDocs is therefore selected as the reference data model.

To harmonize data element names and document structure with UNeDocs, a document-centric approach is used. The following steps are recommended.

> **Step 1: Capture** business processes to identify documents in the information flow
> **Step 2: Define** each data elements extracted from each document in terms of definition, data type, data format, and data constraints in actual operation
> **Step 3: Analyze** data elements across various documents and organize them in a comparable manner (when working with multiple documents)
> **Step 4: Map** the data elements to the UNeDocs Data Model

Step 3 can be skipped if only one document is to be mapped with UNeDocs.

The outcome of this data modeling with UNeDocs exercise is a data model, a subset of UNeDocs. It specifies the structure and properties of a particular document which serve as a basis for message schema development later on. Where XML is employed as message syntax, the data model shall be transformed to XML schema according to UN/CEFACT XML Naming and Design Rules.

Step 1: Capture business processes to identify documents in the information flow

Before modeling data requirements for trade, transport, and administrative documents, it is necessary to understand the business context and the transactional environment in which each document is used and exchanged. The output of the business process analysis enables the data modeler to specify the list of documents to be modeled. It is highly recommended that a basic description of the business processes is described using UML. The *UNESCAP Business Process Analysis Handbook for Paperless Trade* provides the guidelines for analyzing, documenting, and simplifying business processes.

The following diagrams illustrate the use of UN/CEFACT Modeling Methodology (UMM) and Unified Modeling Language (UML) to visually describe business processes.
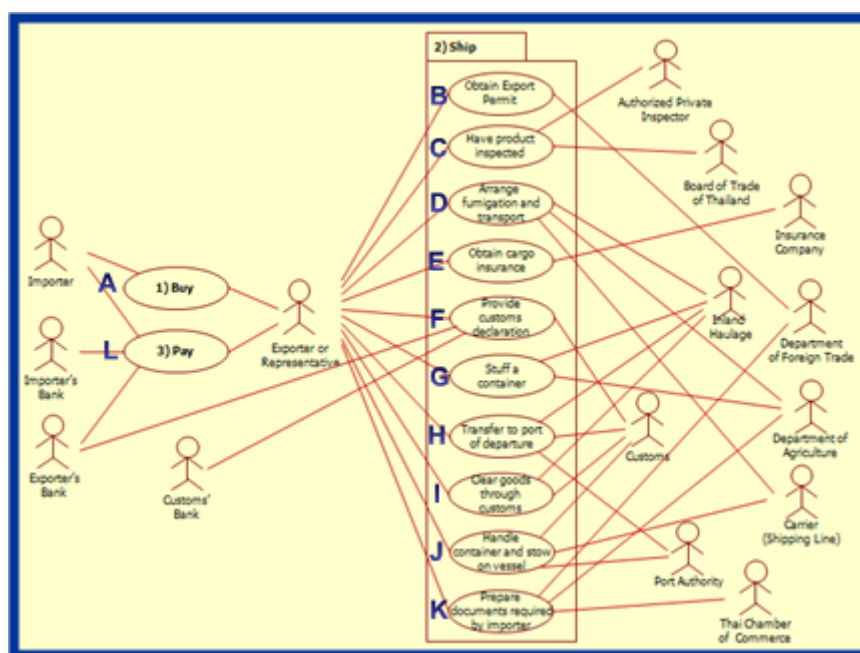
Figure 3-1: An Example of Business Domain View:
A Frame of Reference for Business Process Modeling and Analysis

The use case diagram as shown in Figure 3-1 provides a Business Domain View that establishes the business context of business processes to be studied. The example is based on business processes use in the exportation of Thai jasmine rice. The activity diagrams below provide an elaboration of each use case in terms of business process attributes, their relationships, and information flow between participants who perform business activities in a business process.

Figure 3-2: Example of Activity Diagrams – Use Case Elaboration
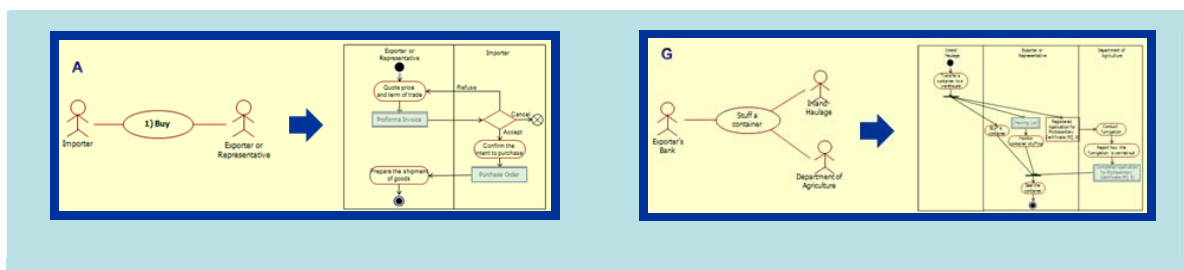
From these activity diagrams, the list of documents to be modeled and the names of party who own each document can be drawn.

1. Proforma Invoice	19. Cover Note
2. Purchase Order	20. Bill of Lading
3. Application for Permission to Export Rice (KP. 2)	21. Insurance Policy
4. Sales Report (KP 3)	22. Export Declaration
5. Application for the Collection of the Permit for the Export of Rice (A. 3)	23. Good Transition Control List
6. Permit for the Export of Rice (A. 4)	24. TKT 308.2
7. Application for Certificate of Standards of Product (MS. 13)	25. Equipment Interchange Report (EIR)
8. Rice Quality Certificate	26. Container Loading List
9. Certificate of Standards of Products (MS. 24)	27. Container List Message
10. Application for Phytosanitary Certificate (PQ. 9)	28. Outward Container List
11. Booking Request Form – Border Crossing	29. Manifest
12. Booking Confirmation – Border Crossing	30. Phytosanitary Certificate
13. Booking Request Form – Inland Transport	31. Certificate of Origin
14. Booking Confirmation – Inland Transport	32. Application for Certificate of Origin
15. Cargo Insurance Application Form	33. Application for Letter of Credit
16. Commercial Invoice	34. Credit Advice
17. Letter of Credit	35. Debit Advice
18. Packing List	36. Remittance Advice

Figure 3-3: Example of Documents Captured from Business Process Analysis Exercise

Step 2: Define each data elements extracted from each document in terms of definition, data type, data format, and data constraints in actual operation

It is necessary that the data modelers have solid understanding of data elements under the scope of data mapping in terms of definition, data type, data format, and data constraints in actual operation. Ambiguity in how these data elements are operationalized not only delays the process of data mapping, but also creates inconsistent use of Business Information Entities across data models.

A Data Dictionary should be created for each document under the scope of harmonization. The Data Dictionaries are then used as a means for future standardization of data definitions and contents. Potential sources of input for the development of a data dictionary are often collected during the business process analysis. Examples are:
- Document/form, with sample fill-in data and/or box completion guideline if available
- EDI Message Implementation Guide
- User Interface (Data Entry Screens), with its data dictionary if possible

A Document Data Dictionary should contain the following pieces of information:
- Document title
- Document purpose
- Name of document owner
- Identification number for each data element name such as the Box Number in the document
- Data element name from the document to be modeled
- Data element definition in local language and/or English as given by the owner of the document and/or relevant standard such as WCO Data Set, UNTDED, and UN/CEFACT Core Component Library
- Data format (alpha, numeric, alpha-numeric) and size (length of a data element value in terms of digits or characters)

11

- Constraint on the occurrence of each data element Occurrence (MinOccurs, MaxOccurs)
- Code lists and subsets of code lists

The data modeler should maintain close consultation with the document owner when defining data elements of a specific document to ensure that the documented data definitions are correct.

Table 3-1 shows an example of a Document Data Dictionary. The Document Data Dictionary is made for Certificate of Origin issued by designated authority under the administration of Department of Foreign Trade, Ministry of Commerce. In this case, the definition and data representation format of each data element are drawn from UNTDED.

Table 3-1: Example of Document Data Dictionary

Document Title   Certificate of Origin

Document Purpose   A Certificate of Origin is a document/message identifying goods, in which the authority or body authorized to issue it, certifies expressly that the goods to which the certificate relates originate in a specific country.

Name of Document Owner   Ministry of Commerce, Thailand

ID	Data Element Name	Data Element Definition	Format	MinOccur	MaxOccur
1	Exporter (name and address)	TDED 3336: Name (and address) of the party consigning the goods as stipulated in the contract by the party ordering the transport (This may be the exporter or seller.)	an..256	1	1
2	Consignee (name and address including country)	TDED 3132: Name and address of party to which goods are consigned	an..256	1	1
3-1	Date of shipment	TDED 2043: Date and optionally time when a consignment of goods departs from last port, airport, or border post of customs territory whence consigned (country of export).	an..19	1	1
3-2	Mode of transport	TDED 8066: Name of a mode of transport.	an..17	1	1
3	Vessel/flight no.	TDED 8028: To identify a journey of a means of transport, for example voyage number, flight number, trip number.	an..17	0	1
4	Place of departure	TDED 3214: Name of the port, airport or other type of location from which a means of transport is scheduled to depart or has departed.	an.. 256	1	1
5	Reference No	TDED 1004: Reference number assigned to a document by the issuer.	an..35	1	1
6-1	Certificate of Origin	TDED 1000: Free text name of a document such as 352 for Proforma invoice, 380 for Commercial invoice.	an..35	1	1
6-2	Ministry of Commerce, Thailand	TDED ----: The name, expressed as text, for the party that issues this exchanged document.	an..256	1	1
7	Country of destination of goods	TDED 3014: Name of the country to which a consignment of goods is to be or has been delivered.	an..35	1	1
8	Supplementary details	TDED 4142: Text related to a document.	an..512	0	1
9	Marks and numbers on packages	TDED 7102: Marks and numbers identifying individual packages	an..512	1	unbounded
10-1	**No.** and kind of packages; description of goods	TDED 7224: Number of packages per goods item packaged in such a way that they cannot be divided without first undoing the package.	n..8	1	unbounded
10-2	No. and kind of packages; **description of goods**	TDED 7002: Plain language description of the nature of a goods item sufficient to identify it for customs, statistical or transport purposes.	an..512	1	unbounded
11	Gross weight	TDED 6292: Weight (mass) of goods including packaging but excluding the carrier's equipment.	n..14	1	unbounded
12-1	Invoice **date** & no.	TDED 2377: Date of issue of an invoice.	an..19	0	unbounded
12-2	Invoice date & **no.**	TDED 1334: Reference number to identify an invoice.	an..35	0	unbounded
13-1	It is hereby certified that the above mentioned goods originate in:	TDED 3238: Name of the country in which the goods have been produced or manufactured, according to criteria laid down for the purposes of application of the Customs tariff, of quantitative restrictions, of any other measure related to trade.	an..35	1	1
13-2	**Place** and date of issue	TDED 3410: Name of the location where a document was issued and when appropriate, signed or otherwise authenticated.	an..256	1	1
13-3	Place and **date of issue**	TDED 2007: Date that a document was issued and when appropriate, signed or otherwise authenticated.	an..19	1	1
13-4	Signature and stamp of certifying authority	TDED 4426: Proof that a document has been authenticated indicating where appropriate the authentication party	an..35	1	1
13-5	Place, date, and signature of authorized signatory	TDED 4426: Proof that a document has been authenticated indicating where appropriate the authentication party	an..35	1	1

Step 3: Analyze the data elements across various documents and organize them in a comparable manner

If harmonizing multiple documents all at once, it is recommended that the data modeler firstly categorizes Document Data Dictionaries according to UNLK family shown in Table 3-3. For documents that fall into the "Ship" process, the data modeler then determines whether the documents intend to describe a single consignment, multiple consignments, or transport equipments. For example, the documents that are captured from business processes use in the exportation of Thai jasmine rice (Figure 3-3) can be categorized as follow.

Table 3-2: Example of Document Categorization

Process	UNLK Document Family			Document
Buy	Commercial Transaction			Proforma Invoice Purchase Order Commercial Invoice Packing List
Ship	Transport and Related Services	Forwarding and Cargo Handling	Single Consignment	N/A
			Multiple Consignments	N/A
			Transport Equipment(s)	TKT 308.2 (Gate Pass) Equipment Interchange Report (EIR)
		Transport	Single Consignment	Bill of Lading Booking Request Form – Border Crossing Booking Confirmation – Border Crossing Booking Request Form – Inland Transport Booking Confirmation – Inland Transport
			Multiple Consignments	Manifest
			Transport Equipment(s)	Container Loading List Container List Message Outward Container List
		Insurance		Cargo Insurance Application Form Cover Note Insurance Policy
	Official Controls			Application for Permission to Export Rice (KP. 2) Sales Report (KP 3) Application for the Collection of the Permit for the Export of Rice (A. 3) Permit for the Export of Rice (A. 4) Application for Certificate of Standards of Product (MS. 13) Rice Quality Certificate Certificate of Standards of Products (MS. 24) Application for Phytosanitary Certificate (PQ. 9) Phytosanitary Certificate Application for Certificate of Origin Certificate of Origin Export Declaration Good Transition Control List
Pay	Payment			Application for Letter of Credit Letter of Credit Credit Advice Debit Advice Remittance Advice

Table 3-3: UNLK Document Family

Process	UNLK Document Family		Documents
Buy	Commercial Transaction		• All documents exchanged between partners in international trade for the invitation to tender, through the exchange between prospective seller and prospective buyer to the inclusion of contract, i.e., Enquiry/Request for quote/Offer invitation; Offer/Quotation; Order; Acknowledgement of order/Pro-forma invoice; Despatch Advice
Ship	Transport and Related Services	Forwarding and Cargo Handling	• Instructions from customers to forwarders, i.e., Forwarding instructions • Goods receipts, i.e., Forwarder's warehouse receipt; Dock receipt; Warehouse (shed) receipt • Advice documents, i.e., Forwarder's advice to import agent, Forwarder's advice to exporter • Authorization and instructions, i.e., Delivery order; Handling order; Gate pass • Administrative documents, i.e., Forwarder's invoice; Port charges documents
		Transport	• Contract documents, i.e., Bill of lading; Waybills; Rail and road consignment notes; Despatch notes for post parcels • Receipt documents, i.e., Receipt of goods for carriage; Mate's receipt; Certificate of transport • Contents documents listing foods in transport units or means of transport, i.e., Cargo and freight manifests • Administrative and legal documents, i.e., Road list; Discharge report • Notification documents, i.e., Booking confirmation, Arrival notice; Delivery notices
		Insurance	• Insurance agreements, i.e., Insurance contract; Insurance policy; Insurance certificate • Notification documents, i.e., Insurance notice; Cover note • Administrative documents, i.e., Premium notice; Insurer's invoice
	Official Controls		• Collection of customs duties and taxes safeguarding of revenue, i.e., Customs goods declaration; Cargo Declaration; Customs invoice; Transit bond-notes • Quantitative restrictions on exports and imports, i.e., Application for export/import licenses; Export/import licenses • Controls and restrictions regarding exchange, i.e., Application for exchange allocation; Foreign exchange permit • Sanitary, veterinary and plant controls, i.e., Phytosanitary, Sanitary and Veterinary certificates; Application for such certificates • Controls of quality and product standards, i.e., Goods control and inspection certificates; Application for such certificates • Granting of preferential treatment for goods of certain origin, i.e., Certificate of origin; Application for such certificates • Restrictions imposed to safeguard public security, cultural heritage, etc., i.e., Dangerous goods declaration • Collection of foreign trade statistics, i.e., Statistical documents for export/import
Pay	Payment		• Instructions (or applications) from customers to banks, i.e., Instruction for bank transfer; Application for banker's draft; Application for banker's guarantee; Collection order; Documentary credit application • Advice or information from banks to customers or to beneficiaries of payment, i.e., Collection payment advice; Documentary credit payment; Acceptance or negotiation advice; Documentary credit; Banker's guarantee • Information exchanged between banks

The data modeler then organizes data elements from Document Data Dictionaries under the scope of data harmonization in a comparable manner. Table 3-4 provides a sample template for a document analysis. Each column represents one document. Data elements and their properties shall be recorded in the same row if they have identical definition.

Table 3-4: Sample Template of Document Data Dictionary Compilation

Doc 1 Document title Document Purpose Name of document owner	Doc 2 Document title Document Purpose Name of document owner	Doc N Document title Document Purpose Name of document owner
ID number Data element name Data definition Data representation format MinOccur MaxOccur	ID number Data element name Data definition Data representation format MinOccur MaxOccur	ID number Data element name Data definition Data representation format MinOccur MaxOccur
ID number Data element name Data definition Data representation format MinOccur MaxOccur		
	ID number Data element name Data definition Data representation format MinOccur MaxOccur	ID number Data element name Data definition Data representation format MinOccur MaxOccur

For the purpose of a document mapping in Step 4, each Document Data Dictionary Compilation table covers data requirements of documents of the similar nature.
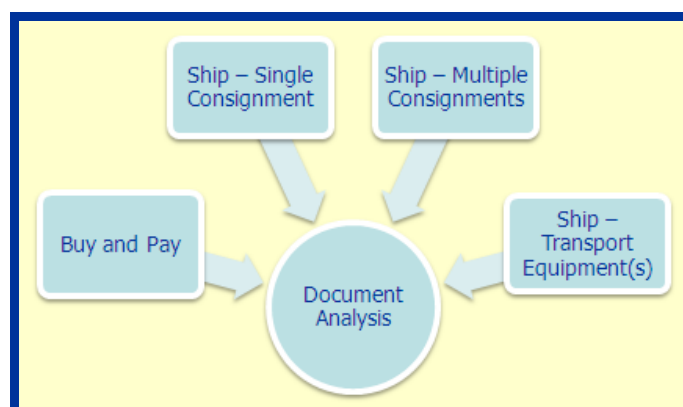
Figure 3-4: Document Categorization for Document Analysis

The properties of documents from commercial transaction and payment sector can be documented in the same spreadsheet. Those required to fulfill the "Ship" process are more complicated. Because the information that the documents intend to convey dictates the structure of the documents themselves, the properties of documents that describe a single consignment, multiple consignments, or transport equipment(s) have to be recorded in different spreadsheet. Table 3-5 is an example of document data dictionary compilation for documents used in the "Ship" process.

Table 3-5: Example of Document Data Dictionary Compilation

Certificate of Origin A Certificate of Origin certifies expressly that the goods to which the certificate relates originate in a specific country. Department of Foreign Trade, Ministry of Commerce, Thailand	Permit for the Export of Rice (A. 4) Permit for the Export of Rice (A. 4) is only given to rice exporters who follow the Ministry of Commerce's Regulation for Rice Exportation 1997. Department of Foreign Trade, Ministry of Commerce, Thailand	Certificate of Standards of Products (MS. 24) Certificate of Standards of Products (MS. 24) certifies that the rice to be exported has the quality set by importer. Board of Trade of Thailand
5 Reference No TDED 1004: Reference number assigned to a document by the issuer an..35 (Min=1, Max=1)	**0-2 Reference No** TDED 1004: Reference number assigned to a document by the issuer an..35 (Min = 1, Max = 1)	**4 Certificate of Standards of Products (MS. 24) -reference ID** TDED 1004: Reference number assigned to a document by the issuer an..35 (Min = 1, Max = 1)
6-1 Certificate of Origin TDED 1000: Free text name of a document such as 352 for Proforma invoice, 380 for Commercial invoice. an..35 (Min=1, Max=1)	**0-1 Permit for the Export of Rice (A. 4)** TDED 1000: Free text name of a document such as 352 for Proforma invoice, 380 for Commercial invoice. an..35 (Min = 1, Max = 1)	**5 Certificate of Standards of Products (MS. 24)** TDED 1000: Free text name of a document such as 352 for Proforma invoice, 380 for Commercial invoice. an..35 (Min = 1, Max = 1)
6-2 Ministry of Commerce, Thailand TDED ----: The name, expressed as text, for the party that issues this exchanged document. an..256 (Min=1, Max=1)		
		1 Permit for the Export of Rice (A. 4) - reference no. TDED 1208: Reference number to identify an export licence or permit. an..35 (Min = 1, Max = 1)
		2 Permit for the Export of Rice (A. 4) - date of issue TDED 2007: Date that a document was issued and when appropriate, signed or otherwise authenticated. an..19 (Min = 1, Max = 1)
		3 Application for Certificate of Standards of Product (MS. 13) - reference ID CCL UN01001570: The unique issuer assigned identifier for this referenced document. an..35 (Min = 1, Max = 1)
	0-3 Permit expiration date TDED 2079: Date on which an export licence expires an..19 (Min = 1, Max = 1)	**22 Certificate expiration date** TDED 2059: Date on which a document expires an..19 (Min = 1, Max = 1)
1 Exporter (name and address) TDED 3336: Name (and address) of the party consigning the goods as stipulated in the contract by the party ordering the transport (This may be the exporter or seller.) an..512 (Min=1, Max=1)	**1-1 Exporter (name and address)** TDED 3336: Name (and address) of the party consigning the goods as stipulated in the contract by the party ordering the transport (This may be the exporter or seller.) an..512 (Min = 1, Max = 1)	**6 Exporter name** TDED 3336: Name of the party consigning the goods as stipulated in the contract by the party ordering the transport (This may be the exporter or seller.) an..256 (Min = 1, Max = 1)

Certificate of Origin	Permit for the Export of Rice (A. 4)	Certificate of Standards of Products (MS. 24)
A Certificate of Origin certifies expressly that the goods to which the certificate relates originate in a specific country. Department of Foreign Trade, Ministry of Commerce, Thailand	Permit for the Export of Rice (A. 4) is only given to rice exporters who follow the Ministry of Commerce's Regulation for Rice Exportation 1997. Department of Foreign Trade, Ministry of Commerce, Thailand	Certificate of Standards of Products (MS. 24) certifies that the rice to be exported has the quality set by importer. Board of Trade of Thailand
	1-2 Exporter - tax ID TDED 3446: To identify a number assigned to a party by a tax authority. an..20 (Min = 1, Max = 1)	**8 Exporter - tax ID** TDED 3446: To identify a number assigned to a party by a tax authority. an..20 (Min = 1, Max = 1)
	1-3 Exporter - rice exporter ID CCL UN01003641: A unique identifier for this legally set up organization. an..20 (Min = 1, Max = 1)	**7 Exporter - rice exporter ID** CCL UN01003641: A unique identifier for this legally set up organization. an..20 (Min = 1, Max = 1)
2 Consignee (name, address, country) TDED 3132: Name and address of party to which goods are consigned an..512 (Min=1, Max=1)	**2 Consignee (name and address)** TDED 3132: Name and address of party to which goods are consigned an..512 (Min = 1, Max = 1)	
	3-1 Exporter agent (name and address) TDED 3196: Name and address of a party authorised to act on behalf of another party. an..512 (Min = 0, Max = 1)	
	3-2 Exporter agent - role TDED 3035: Code giving specific meaning to role of a party. an..3 (Min = 0, Max = 1)	
	4 Buyer (name, address, and country) TDED 3002: Name and address of a party to which merchandise or services are sold. an..512 (Min = 0, Max = 1)	
		19 Loading date TDED 2347: Date and optionally time when a consignment is to be or has been loaded onto a means of transport an..19 (Min = 1, Max = 1)
3-1 Date of shipment TDED 2043: Date and optionally time when a consignment of goods departs from last port, airport, or border post of customs territory whence consigned (country of export). an..19 (Min=1, Max=1)	**9-1 Date of shipment (estimated)** TDED 2043: Date and optionally time when a consignment of goods departs from last port, airport, or border post of customs territory whence consigned (country of export). an..19 (Min = 1, Max = 1)	
3-2 Mode of transport TDED 8066: Name of a mode of transport an..17 (Min=1, Max=1)	**9-2 Mode of transport** TDED 8066: Name of a mode of transport an..17 (Min = 1, Max = 1)	
3 Vessel/flight no. TDED 8028: To identify a journey of a means of transport, for example voyage number, flight number, trip number an..17 (Min= 0, Max=1)	**10 Vessel/flight no.** TDED 8028: To identify a journey of a means of transport, for example voyage number, flight number, trip number an..17 (Min = 0, Max = 1)	

Certificate of Origin A Certificate of Origin certifies expressly that the goods to which the certificate relates originate in a specific country. Department of Foreign Trade, Ministry of Commerce, Thailand	Permit for the Export of Rice (A. 4) Permit for the Export of Rice (A. 4) is only given to rice exporters who follow the Ministry of Commerce's Regulation for Rice Exportation 1997. Department of Foreign Trade, Ministry of Commerce, Thailand	Certificate of Standards of Products (MS. 24) Certificate of Standards of Products (MS. 24) certifies that the rice to be exported has the quality set by importer. Board of Trade of Thailand
4 Place of departure TDED 3214: Name of the port, airport or other type of location from which a means of transport is scheduled to depart or has departed an.. 256 (Min=1, Max=1)	**11 Place of departure** TDED 3214: Name of the port, airport or other type of location from which a means of transport is scheduled to depart or has departed an.. 256 (Min = 1, Max = 1)	**20 Place of departure** TDED 3214: Name of the port, airport or other type of location from which a means of transport is scheduled to depart or has departed an.. 256 (Min = 1, Max = 1)
7 Country of destination of goods TDED 3014: Name of the country to which a consignment of goods is to be or has been delivered. an..35 (Min=1, Max=1)	**5 Destination country** TDED 3216:Name of the country to which the goods are to be delivered to the final consignee or buyer an..35 (Min = 1, Max = 1)	**21 Country of destination of goods** TDED 3014: Name of the country to which a consignment of goods is to be or has been delivered. an..35 (Min = 1, Max = 1)
8 Supplementary details TDED 4142: Text related to a document. an..512 (Min=0, Max=1)		
	12 Line item TDED 1082: An identifier differentiating an individual line item from within a series an..6 (Min = 1, Max = unbounded)	
	17 Price (FOB) TDED 5032: Amount declared for customs purposes of those goods in a consignment which are subject to the same customs procedure, and have the same tariff/statistical heading, country information and duty regime n..18 (Min = 1, Max = unbounded)	**13 FOB Amount** TDED 5032: Amount declared for customs purposes of those goods in a consignment which are subject to the same customs procedure, and have the same tariff/statistical heading, country information and duty regime n..18 (Min = 1, Max = unbounded)
9 Marks and numbers on packages TDED 7102: Marks and numbers identifying individual packages an..512 (Min=1, Max= unbounded)		**18 Marks and numbers on packages** TDED 7102: Marks and numbers identifying individual packages an..512 (Min = 1, Max = unbounded)
10-2 Description of goods TDED 7002: Plain language description of the nature of a goods item sufficient to identify it for customs, statistical or transport purposes an..512 (Min=1, Max= unbounded)	**13 Description of goods** TDED 7002: Plain language description of the nature of a goods item sufficient to identify it for customs, statistical or transport purposes an..512 (Min = 1, Max = unbounded)	
10-1 No. and kind of packages TDED 7224: Number of packages per goods item packaged in such a way that they cannot be divided without first undoing the package n..8 (Min=1, Max= unbounded)		**14 Quantity** TDED 7224: Number of packages per goods items packaged in such a way that they cannot be divided without first undoing the packing. n..8 (Min = 1, Max = unbounded)
11 Gross weight TDED 6292: Weight (mass) of goods including packaging but excluding the carrier's equipment. n..14 (Min=1, Max= unbounded)		

Certificate of Origin A Certificate of Origin certifies expressly that the goods to which the certificate relates originate in a specific country. Department of Foreign Trade, Ministry of Commerce, Thailand	Permit for the Export of Rice (A. 4) Permit for the Export of Rice (A. 4) is only given to rice exporters who follow the Ministry of Commerce's Regulation for Rice Exportation 1997. Department of Foreign Trade, Ministry of Commerce, Thailand	Certificate of Standards of Products (MS. 24) Certificate of Standards of Products (MS. 24) certifies that the rice to be exported has the quality set by importer. Board of Trade of Thailand
	15 Net weight TDED 6016: Weight (mass) of goods item excluding all packing n..16 (Min = 1, Max = unbounded)	**12 Net weight** TDED 6016: Weight (mass) of goods item excluding all packing n..16 (Min = 1, Max = unbounded)
	14 Commodity code TDED 7133: Code qualifying a type of product details. an..3 (Min = 1, Max = 1)	
		9 Product name TDED 7134: Name identifying a product. an..35 (Min = 1, Max = 1)
		10 Product type TDED 7036: Free form description of a characteristic. an..35 (Min = 1, Max = 1)
		11 Product classification CCL UN01002612: A class name, expressed as text, for this product classification. an..70 (Min = 0, Max = 1)
	16 Unit price TDED 5110: Price per unit of quantity on which an article item amount is calculated n..18 (Min = 1, Max = unbounded)	**17 Unit price** TDED 5110: Price per unit of quantity on which an article item amount is calculated n..18 (Min = 1, Max = unbounded)
		15 Net weight - package TDED 6026: Weight (mass) of a package including all packing n..16 (Min = 1, Max = unbounded)
		16 Gross weight - package TDED 6022: Weight (mass) of a package excluding all packing n..16 (Min = 1, Max = unbounded)
12-1 Invoice date TDED 2377: Date of issue of an invoice an..19 (Min=0, Max= unbounded)		
12-2 Invoice no. TDED 1334: Reference number to identify an invoice an..35 (Min=0, Max= unbounded)		
13-1 Other information TDED 4440: Free form description of information details. an..256 (Min=0, Max= unbounded)	**6 For Customs** TDED 4440: Free form text. an..512 (Min = 0, Max = 1)	
	7 Currency TDED 6343: Code specifying a type of currency. an..3 (Min = 1, Max = 1)	

Certificate of Origin A Certificate of Origin certifies expressly that the goods to which the certificate relates originate in a specific country. Department of Foreign Trade, Ministry of Commerce, Thailand	Permit for the Export of Rice (A. 4) Permit for the Export of Rice (A. 4) is only given to rice exporters who follow the Ministry of Commerce's Regulation for Rice Exportation 1997. Department of Foreign Trade, Ministry of Commerce, Thailand	Certificate of Standards of Products (MS. 24) Certificate of Standards of Products (MS. 24) certifies that the rice to be exported has the quality set by importer. Board of Trade of Thailand
13-2 goods originate in: TDED 3238: Name of the country in which the goods have been produced or manufactured, according to criteria laid down for the purposes of application of the Customs tariff, of quantitative restrictions, of any other measure related to trade. an..35 (Min=1, Max= 1)		
	8 Exchange rate TDED 5402: The rate at which one specified currency is expressed in another specified currency. n..18 (Min = 1, Max = 1)	
13-3 Place of issue TDED 3410: Name of the location where a document was issued and when appropriate, signed or otherwise authenticated. an..256 (Min=1, Max= 1)		
13-4 Date of issue TDED 2007: Date that a document was issued and when appropriate, signed or otherwise authenticated. an..19 (Min=1, Max= 1)	**18-1 Date of issue** TDED 2007: Date that a document was issued and when appropriate, signed or otherwise authenticated. an..19 (Min = 1, Max = 1)	**23 Date of issue** TDED 2007: Date that a document was issued and when appropriate, signed or otherwise authenticated. an..19 (Min = 1, Max = 1)
13-5 Signature and stamp of certifying authority TDED 4426: Proof that a document has been authenticated indicating where appropriate the authentication party an..35 (Min=1, Max= 1)		
13-6 Place, date, and signature of authorized signatory TDED 4426: Proof that a document has been authenticated indicating where appropriate the authentication party an..35 (Min=1, Max= 1)	**18-2 Signature and stamp of certifying authority** TDED 4426: Proof that a document has been authenticated indicating where appropriate the authentication party an..35 (Min = 1, Max = 1)	**24 Signature and stamp of authorized signatory** TDED 4426: Proof that a document has been authenticated indicating where appropriate the authentication party an..35 (Min = 1, Max = 1)

Step 4: Map the data elements to the UNeDocs Data Model

The mapping shall start after the Document Data Dictionary Compilation developed in Step 3 is verified by the owners of the documents and agreed upon by all relevant stakeholders. By mapping documents of the similar category to the reference data model at once, an inconsistency in interpreting data definition and selecting the equivalent Dictionary Entry Names (DENs) [13] in the UNeDocs Data Model can be reduced.

For each Document Data Dictionary Compilation resulted from the completion of Step 3, the data modeler maps each definition of a data element with the equivalent DENs from appropriate UNeDocs Business Information Master (BIM). While the documents from commercial transaction and payment sector are to be mapped with the equivalent DENs in UNeDocs Buy BIM, those required to fulfill the "Ship" process are to be mapped with the equivalent DENs in UNeDocs Ship BIM.
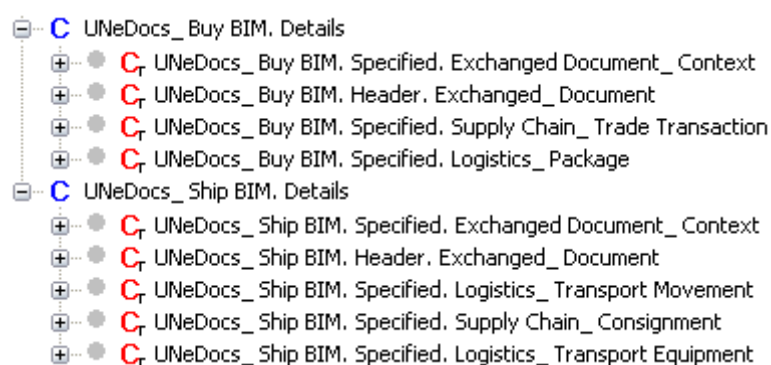
Figure 3-5: UNeDocs BIMs and its Highest Level Components

Mapping documents from commercial transaction and payment sector is straight forward. They all share a similar document structure. Mapping documents used in the "Ship" process on the other hand is relatively more complicated. The document structure of the documents that describe goods in a single consignment, multiple consignments, or transport equipment(s) differs. Table 3-6 summarizes possible high-level of structures for different document categories.

Table 3-6: High-level Document Structures for Documents Used in "Ship" Process

Document Category	Ship BIM's Highest ASBIE	MinOccur	MaxOccur
Single Consignment	UNeDocs_ Ship BIM. Specified. Supply Chain_ Consignment	1	1
Multiple Consignments	UNeDocs_ Ship BIM. Specified. Logistics_ Transport Movement	1	1
	UNeDocs_ Ship BIM. Specified. Supply Chain_ Consignment	1	Unbounded
Transport Equipment(s)	UNeDocs_ Ship BIM. Specified. Logistics_ Transport Movement	0	1
	UNeDocs_ Ship BIM. Specified. Logistics_ Transport Equipment	1	1/Unbounded

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[13] Dictionary Entry Name (DEN) is the terminology for a data element name in UN/CEFACT Core Component Library.

It is recommended that the data modeler records the mapping result in the spreadsheet format. The sample template for mapping documentation/message implementation guide is shown in Table 3-7. It is important to note that the sequence of data elements recorded in the mapping documentation/message implementation guide follows the sequence of DENs in the UNeDocs Data Model.

The mapping documentation/message implementation guide in term of DENs and their position in the data model that complies with UNeDocs can be used later as a basis for 1) the verification and validation with relevant stakeholders and 2) for the transformation of document-specific data structure into XML schema where XML auto-generation tool of XML schema is not accessible.

Browsing DENs in UNeDocs can be done with or without a specialized software tool. When software tool that supports UNeDocs is not accessible, browsing DENs in UNeDocs becomes extremely complicated and time-consuming. Sound knowledge of CCTS is required. The data modeler has to go through UNeDocs in a spreadsheet format, look for relevant Dictionary Entry Names, identify the path of the selected BBIE for each data definition, and correctly document the finding in the template for mapping documentation/message implementation guide. Annex A discusses in details how to carry out these activities.

Data modeling tools can greatly facilitate work of data modelers

Table 3-7: Sample Template for Mapping Documentation/Message Implementation Guide

ASBIE (Association Business Information Entity)	BBIE (Basic Business Information Entity)	SC (Supplementary Component of Data Type)	Doc 1 Document title Document Purpose Name of document owner	Doc 2 Document title Document Purpose Name of document owner	Doc N Document title Document Purpose Name of document owner
			ID number Data element name Data definition Data representation format MinOccur MaxOccur	ID number Data element name Data definition Data representation format MinOccur MaxOccur	ID number Data element name Data definition Data representation format MinOccur MaxOccur
			ID number Data element name Data definition Data representation format MinOccur MaxOccur		
				ID number Data element name Data definition Data representation format MinOccur MaxOccur	ID number Data element name Data definition Data representation format MinOccur MaxOccur

ASBIE, BBIE, and SC are different types of Dictionary Entry Name (DEN). In CCTS, a DEN is formulated as a tripartite name.
- Trade_ Party. Name. Text is an example of BBIE. It consists of an object class term, a property term, and a representation term. The representation terms that are regularly used can be seen from Table 2.3-1.
- Supply Chain_ Consignment. Consignor. Trade_ Party is an example of ASBIE. It consists of an object class term, a property term, and an object class term of another ASBIE. ASBIE indicates the path of BBIE in the data model.
- Data type consists of 2 parts. They are a Content Component and a Supplementary Component (SC) which carries essential extra definition to the content. Examples of SC are Amount Currency. Identifier, Measure Unit. Code, and Quantity Unit. Code.

Annex A: Browsing UNeDocs without a Modeling Tool

If a software tool that specifically supports CCTS and UNeDocs modeling is not accessible, a mapping exercise is more complicated and time-consuming. The data modeler has to manually extract relevant dictionary entry names from the UNeDocs data model which is made available for download in a spreadsheet format.

The UNeDocs Workbase is now officially named as 'The UN/CEFACT Buy Ship Pay subset for International Trade (including UNeDocs)'. As this has not yet been formally published on the UN/CEFACT website in its spreadsheet format, this explanation of "Mapping without a Tool" is based on the final draft which was approved for publication by the UN/CEFACT Forum International Business Process Group (TBG) in September 2008. [14]

The BSP & UNeDocs spreadsheet[15] contains 4 worksheets.
i. The BIM worksheet provides reusable high-level message structures which can be used for the definition of multiple subset document structures.
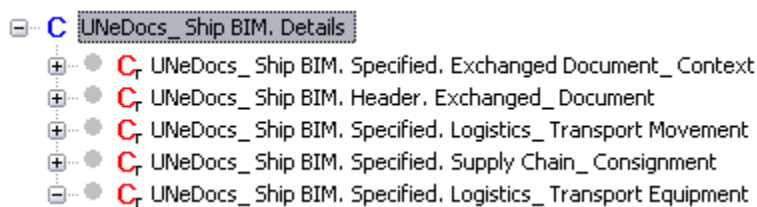

Figure A-1: Example of a UNeDocs BIM and its Major Components

Figure A-1 shows that in CCTS terminology the UNeDocs Ship BIM. Detail is an ABIE which is an aggregation of 4 major components known as ASBIEs. The sequence of these ASBIEs provides the structure of a reusable message pattern drawn from the highest-level structures in the UN/CEFACT D08B Core Component Library BSP and UNeDocs subset. To maximise semantic interoperability, it is recommended that these structures should be strictly followed when defining national, regional or community-based derived document structures and guidelines.

Each ASBIE shows the relationship between the UNeDocs Ship BIM. Details and the CCL ABIEs/ACCs from which they derive. For example:
– UNeDocs Ship BIM. Specified. Logistics_ Transport Movement indicates the relationship between the UNeDocs Ship BIM. Details and the Logistics_ Transport Movement. Details ABIE
– UNeDocs Ship BIM. Transport Contract. Supply-Chain_ Consignment indicates the relationship between UNeDocs Ship BIM. Details and the Supply Chain_ Consignment. Details ABIE

ASBIEs are CCTS structures made up of CCTS components. Ultimately they consist of data elements at different levels. These components are either simple data elements known as BBIEs or complex data elements (ASBIE) or both.

ii. The BIE worksheet lists all details of the ABIEs which are used within the BSP & UNeDocs subset library. These details include UN assigned Unique IDs, dictionary entry names, definitions and cardinalities.

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[14] http://www.apec-dh.org/BSP-02SEP08.xls
[15] BSP-UNeDocs Draft Business Standard 02SEP08 (2).xls

B	C	D	E
Unique UN Assigned ID	ABIE/ BBIE/ ASBIE/ACC/ BCC/ASCC/D T/CC/SC	Dictionary Entry Name (auto generated)	Definition Mandatory
UN01002572	ASBIE	Cross-Border_ Transport Movement. Used. Cross-Border_ Transport Means	The cross-border transport means used for this cross-border transport movement.
UN01003837	ABIE	Logistics_ Transport Movement. Details	The conveyance (physical carriage) of goods or other objects used for logistics transport purposes.
UN01003838	BBIE	Logistics_ Transport Movement. Stage. Code	The code specifying the stage of this logistics transport movement.
UN01003839	BBIE	Logistics_ Transport Movement. Mode. Code	The code specifying the mode, such as by air, sea, rail, road or inland waterway, for this logistics transport movement.
UN01003840	BBIE	Logistics_ Transport Movement. Mode. Text	The mode, expressed as text, of this logistics transport movement.

Figure A-2: Example of UNeDocs Dictionary Entry Names

For example, the structure of the ABIE called Supply Chain_ Consignment. Details which are one of the high-level library ABIEs with which UNeDocs Ship BIM. Details is associated can be found in the BIE worksheet. In figure A-2, key characteristics of ABIE, ASBIE, and BBIE can be seen.

Table A-1: Key Characteristics of BIEs

BIE	Characteristics
ABIE	Logistics_ Transport Movement. Details Object Class Term + Details
BBIE	Logistics_ Transport Movement. Mode. Code Object Class Term + Property Term + Representation Term (where representation term refers to CCTS data type, i.e., amount, binary object, code, date time, identifier, indicator, measure, numeric, quantity, and text)
ASBIE	Logistics_ Transport Movement. Used. Logistics_ Transport Means Object Class Term + Property Term + Object Class Term of Associated ABIE

For example, to look for a dictionary entry name in UNeDocs that is equivalent to the name of a transport mode, we have to first determine which ASBIE in UNeDocs Ship BIM. Detail is the structure which should contain such a data element. Based on the definition of each ASBIE provided in the BIM worksheet, it is likely that the dictionary entry name for the name of the transport mode is likely to be found in UNeDocs Ship BIM. Specified. Logistics_ Transport Movement.

It is then straightforward to find the transport mode name as it is a simple data element within this ABIE. Data modelers can then document a mapping to the Cross-Border_ Transport Movement. Mode. Text BBIE.

However, to find a Dictionary Entry Name in UNeDocs that is equivalent to a vessel name requires another step. Because a vessel name is seen as an attribute of a means of transport, its dictionary entry name is therefore listed under Logistics_ Transport Means. Detail which is an ABIE associated from the ABIE Logistics_ Transport Movement.

Table A-2: Mapping Documentation

Data Element Name	ASBIE	BBIE
Transport Mode Name	UNeDocs Ship BIM. Specified. Logistics_ Transport Movement	Logistics_ Transport Movement. Mode. Text
Vessel Name	UNeDocs Ship BIM. Specified. Logistics_ Transport Movement Cross-Border_ Transport Movement. Used. Logistics_ Transport Means	Logistics_ Transport Means. Name. Text

iii. The ACC worksheet contains core components structures from the UN/CEFACT Core Component Library upon which the UNeDocs ABIEs are built.

Annex B: Mapping Example

ASBIE	BBIE	SC	Certificate of Origin A Certificate of Origin certifies expressly that the goods to which the certificate relates originate in a specific country. Department of Foreign Trade, Ministry of Commerce, Thailand	Permit for the Export of Rice (A. 4) Permit for the Export of Rice (A. 4) is only given to rice exporters who follow the Ministry of Commerce's Regulation for Rice Exportation 1997. Department of Foreign Trade, Ministry of Commerce, Thailand	Certificate of Standards of Products (MS. 24) Certificate of Standards of Products (MS. 24) certifies that the rice to be exported has the quality set by importer. Board of Trade of Thailand
UNeDocs_ Ship BIM. Header. Exchanged_ Document	Exchanged_ Document. Identification. Identifier		**5 Reference No** TDED 1004: Reference number assigned to a document by the issuer an..35 (Min=1, Max=1)	**0-2 Reference No** TDED 1004: Reference number assigned to a document by the issuer an..35 (Min = 1, Max = 1)	**4 Certificate of Standards of Products (MS. 24) -reference ID** TDED 1004: Reference number assigned to a document by the issuer an..35 (Min = 1, Max = 1)
UNeDocs_ Ship BIM. Header. Exchanged_ Document	Exchanged_ Document. Name. Text		**6-1 Certificate of Origin** TDED 1000: Free text name of a document such as 352 for Proforma invoice, 380 for Commercial invoice. an..35 (Min=1, Max=1)	**0-1 Permit for the Export of Rice (A. 4)** TDED 1000: Free text name of a document such as 352 for Proforma invoice, 380 for Commercial invoice. an..35 (Min = 1, Max = 1)	**5 Certificate of Standards of Products (MS. 24)** TDED 1000: Free text name of a document such as 352 for Proforma invoice, 380 for Commercial invoice. an..35 (Min = 1, Max = 1)
UNeDocs_ Ship BIM. Header. Exchanged_ Document	Exchanged_ Document. Issue. Date Time		**13-3 Date of issue** TDED 2007: Date that a document was issued and when appropriate, signed or otherwise authenticated. an..19 (Min=1, Max= 1)	**18-1 Date of issue** TDED 2007: Date that a document was issued and when appropriate, signed or otherwise authenticated. an..19 (Min = 1, Max = 1)	**23 Date of issue** TDED 2007: Date that a document was issued and when appropriate, signed or otherwise authenticated. an..19 (Min = 1, Max = 1)
UNeDocs_ Ship BIM. Header. Exchanged_ Document	Exchanged_ Document. Information. Text		**8 Supplementary details** TDED 4142: Text related to a document. an..512 (Min=0, Max=1)		
UNeDocs_ Ship BIM. Header. Exchanged_ Document Exchanged_ Document. Effective. Specified_ Period	Specified_ Period. End. Date Time			**0-3 Permit expiration date** TDED 2079: Date on which an export licence expires an..19 (Min = 1, Max = 1)	**22 Certificate expiration date** TDED 2059: Date on which a document expires an..19 (Min = 1, Max = 1)

ASBIE	BBIE	SC	Certificate of Origin A Certificate of Origin certifies expressly that the goods to which the certificate relates originate in a specific country. Department of Foreign Trade, Ministry of Commerce, Thailand	Permit for the Export of Rice (A. 4) Permit for the Export of Rice (A. 4) is only given to rice exporters who follow the Ministry of Commerce's Regulation for Rice Exportation 1997. Department of Foreign Trade, Ministry of Commerce, Thailand	Certificate of Standards of Products (MS. 24) Certificate of Standards of Products (MS. 24) certifies that the rice to be exported has the quality set by importer. Board of Trade of Thailand
UNeDocs_ Ship BIM. Header. Exchanged_ Document Exchanged_ Document. Issue. Logistics_ Location Exchanged_ Document. Issue. Logistics_ Location	Logistics_ Location. Name. Text		**13-2 Place of issue** TDED 3410: Name of the location where a document was issued and when appropriate, signed or otherwise authenticated. an..256 (Min=1, Max= 1)		
UNeDocs_ Ship BIM. Header. Exchanged_ Document Exchanged_ Document. First_ Signatory. Document_ Authentication	Document_ Authentication. Statement. Text		**13-5 Place, date, and signature of authorized signatory** TDED 4426: Proof that a document has been authenticated indicating where appropriate the authentication party an..35 (Min=1, Max= 1)	**18-2 Signature and stamp of certifying authority** TDED 4426: Proof that a document has been authenticated indicating where appropriate the authentication party an..35 (Min = 1, Max = 1)	**24 Signature and stamp of authorized signatory** TDED 4426: Proof that a document has been authenticated indicating where appropriate the authentication party an..35 (Min = 1, Max = 1)
UNeDocs_ Ship BIM. Header. Exchanged_ Document Exchanged_ Document. First_ Signatory. Document_ Authentication Document_ Authentication. Provider. Trade_ Party	Trade_ Party. Name. Text		**6-2 Ministry of Commerce, Thailand** TDED ----: The name, expressed as text, for the party that issues this exchanged document. an..256 (Min=1, Max=1)		
UNeDocs_ Ship BIM. Header. Exchanged_ Document Exchanged_ Document. First_ Signatory. Document_ Authentication Document_ Authentication. Provider. Trade_ Party Trade_ Party. Specified. Representative_ Person	Representative_ Person. Role. Text			**18-3 Title of certifying authority** TDED 3840: Name of a job title, such as rank or rating of crew member. an..17 (Min = 1, Max = 1)	

ASBIE	BBIE	SC	Certificate of Origin A Certificate of Origin certifies expressly that the goods to which the certificate relates originate in a specific country. Department of Foreign Trade, Ministry of Commerce, Thailand	Permit for the Export of Rice (A. 4) Permit for the Export of Rice (A. 4) is only given to rice exporters who follow the Ministry of Commerce's Regulation for Rice Exportation 1997. Department of Foreign Trade, Ministry of Commerce, Thailand	Certificate of Standards of Products (MS. 24) Certificate of Standards of Products (MS. 24) certifies that the rice to be exported has the quality set by importer. Board of Trade of Thailand
UNeDocs_ Ship BIM. Header. Exchanged_ Document Exchanged_ Document. Second_ Signatory. Document_ Authentication	Document_ Authentication. Statement. Text		**13-4 Signature and stamp of certifying authority** TDED 4426: Proof that a document has been authenticated indicating where appropriate the authentication party an..35 (Min=1, Max= 1)		
UNeDocs_ Ship BIM. Header. Exchanged_ Document Exchanged_ Document. Reference. Referenced_ Document	Referenced_ Document. Issuer Assigned_ Identification. Identifier Referenced_ Document. Issue. Date Time Referenced_ Document. Name. Text				**1 Permit for the Export of Rice (A. 4) - reference no. and date of issue** TDED 1208: Reference number to identify an export licence or permit. an..35 (Min = 1, Max = 1) TDED 2007: Date that a document was issued and when appropriate, signed or otherwise authenticated. an..19 (Min = 1, Max = 1)
UNeDocs_ Ship BIM. Header. Exchanged_ Document Exchanged_ Document. Reference. Referenced_ Document	Referenced_ Document. Issuer Assigned_ Identification. Identifier Referenced_ Document. Name. Text				**3 Application for Certificate of Standards of Product (MS. 13) - reference ID** CCL UN01001570: The unique issuer assigned identifier for this referenced document. an..35 (Min = 1, Max = 1)
UNeDocs_ Ship BIM. Specified. Supply Chain_ Consignment Supply Chain_ Consignment. Consignor. Trade_ Party	Trade_ Party. Name. Text		**1 Exporter (<u>name</u> and address)** TDED 3336: Name (and address) of the party consigning the goods as stipulated in the contract by the party ordering the transport (This may be the exporter or seller.) an..512 (Min=1, Max=1)	**1-1 Exporter (<u>name</u> and address)** TDED 3336: Name (and address) of the party consigning the goods as stipulated in the contract by the party ordering the transport (This may be the exporter or seller.) an..512 (Min = 1, Max = 1)	**6 Exporter name** TDED 3336: Name of the party consigning the goods as stipulated in the contract by the party ordering the transport (This may be the exporter or seller.) an..256 (Min = 1, Max = 1)

ASBIE	BBIE	SC	Certificate of Origin A Certificate of Origin certifies expressly that the goods to which the certificate relates originate in a specific country. Department of Foreign Trade, Ministry of Commerce, Thailand	Permit for the Export of Rice (A. 4) Permit for the Export of Rice (A. 4) is only given to rice exporters who follow the Ministry of Commerce's Regulation for Rice Exportation 1997. Department of Foreign Trade, Ministry of Commerce, Thailand	Certificate of Standards of Products (MS. 24) Certificate of Standards of Products (MS. 24) certifies that the rice to be exported has the quality set by importer. Board of Trade of Thailand
UNeDocs_ Ship BIM. Specified. Supply Chain_ Consignment Supply Chain_ Consignment. Consignor. Trade_ Party Trade_ Party. Postal. Trade_ Address	Trade_ Address. Postcode. Code Trade_ Address. Line One. Text Trade_ Address. Line Two. Text Trade_ Address. Line Three. Text Trade_ Address. Line Four. Text Trade_ Address. Line Five. Text Trade_ Address. Street Name. Text Trade_ Address. City Name. Text Trade_ Address. City Sub-Division Name. Text Trade_ Address. Country. Identifier Trade_ Address. Country Name. Text Trade_ Address. Country Sub-Division. Identifier Trade_ Address. Country Sub-Division Name. Text		**1 Exporter (name and <u>address</u>)** TDED 3336: Name (and address) of the party consigning the goods as stipulated in the contract by the party ordering the transport (This may be the exporter or seller.) an..512 (Min=1, Max=1)	**1-1 Exporter (name and <u>address</u>)** TDED 3336: Name (and address) of the party consigning the goods as stipulated in the contract by the party ordering the transport (This may be the exporter or seller.) an..512 (Min = 1, Max = 1)	
UNeDocs_ Ship BIM. Specified. Supply Chain_ Consignment Supply Chain_ Consignment. Consignor. Trade_ Party Trade_ Party. Specified. Legal_ Organization	Legal_ Organization. Identification. Identifier			**1-3 Exporter - rice exporter ID** CCL UN01003641: A unique identifier for this legally set up organization. an..20 (Min = 1, Max = 1)	**7 Exporter - rice exporter ID** CCL UN01003641: A unique identifier for this legally set up organization. an..20 (Min = 1, Max = 1)
UNeDocs_ Ship BIM. Specified. Supply Chain_ Consignment Supply Chain_ Consignment. Consignor. Trade_ Party Trade_ Party. Specified. Tax_ Registration	Tax_ Registration. Identification. Identifier			**1-2 Exporter - tax ID** TDED 3446: To identify a number assigned to a party by a tax authority. an..20 (Min = 1, Max = 1)	**8 Exporter - tax ID** TDED 3446: To identify a number assigned to a party by a tax authority. an..20 (Min = 1, Max = 1)
UNeDocs_ Ship BIM. Specified. Supply Chain_ Consignment Supply Chain_ Consignment. Consignee. Trade_ Party	Trade_ Party. Name. Text		**2 Consignee (<u>name</u>, address, country)** TDED 3132: Name and address of party to which goods are consigned an..512 (Min=1, Max=1)	**2 Consignee (<u>name</u> and address)** TDED 3132: Name and address of party to which goods are consigned an..512 (Min = 1, Max = 1)	

ASBIE	BBIE	SC	Certificate of Origin A Certificate of Origin certifies expressly that the goods to which the certificate relates originate in a specific country. Department of Foreign Trade, Ministry of Commerce, Thailand	Permit for the Export of Rice (A. 4) Permit for the Export of Rice (A. 4) is only given to rice exporters who follow the Ministry of Commerce's Regulation for Rice Exportation 1997. Department of Foreign Trade, Ministry of Commerce, Thailand	Certificate of Standards of Products (MS. 24) Certificate of Standards of Products (MS. 24) certifies that the rice to be exported has the quality set by importer. Board of Trade of Thailand
UNeDocs_ Ship BIM. Specified. Supply Chain_ Consignment Supply Chain_ Consignment. Consignee. Trade_ Party Trade_ Party. Postal. Trade_ Address	Trade_ Address. Postcode. Code Trade_ Address. Line One. Text Trade_ Address. Line Two. Text Trade_ Address. Line Three. Text Trade_ Address. Line Four. Text Trade_ Address. Line Five. Text Trade_ Address. Street Name. Text Trade_ Address. City Name. Text Trade_ Address. City Sub-Division Name. Text Trade_ Address. Country. Identifier Trade_ Address. Country Name. Text Trade_ Address. Country Sub-Division. Identifier Trade_ Address. Country Sub-Division Name. Text		**2 Consignee (name, <u>address, country</u>)** TDED 3132: Name and address of party to which goods are consigned an..512 (Min=1, Max=1)	**2 Consignee (name and <u>address</u>)** TDED 3132: Name and address of party to which goods are consigned an..512 (Min = 1, Max = 1)	
UNeDocs_ Ship BIM. Specified. Supply Chain_ Consignment Supply Chain_ Consignment. Consignor Agent. Trade_ Party	Trade_ Party. Name. Text			**3-1 Exporter agent (<u>name</u> and address)** TDED 3196: Name and address of a party authorised to act on behalf of another party. an..512 (Min = 0, Max = 1)	
UNeDocs_ Ship BIM. Specified. Supply Chain_ Consignment Supply Chain_ Consignment. Consignor Agent. Trade_ Party	Trade_ Party. Role. Code			**3-2 Exporter agent - role** TDED 3035: Code giving specific meaning to role of a party. an..3 (Min = 0, Max = 1)	

ASBIE	BBIE	SC	Certificate of Origin A Certificate of Origin certifies expressly that the goods to which the certificate relates originate in a specific country. Department of Foreign Trade, Ministry of Commerce, Thailand	Permit for the Export of Rice (A. 4) Permit for the Export of Rice (A. 4) is only given to rice exporters who follow the Ministry of Commerce's Regulation for Rice Exportation 1997. Department of Foreign Trade, Ministry of Commerce, Thailand	Certificate of Standards of Products (MS. 24) Certificate of Standards of Products (MS. 24) certifies that the rice to be exported has the quality set by importer. Board of Trade of Thailand
UNeDocs_ Ship BIM. Specified. Supply Chain_ Consignment Supply Chain_ Consignment. Consignor Agent. Trade_ Party Trade_ Party. Postal. Trade_ Address	Trade_ Address. Postcode. Code Trade_ Address. Line One. Text Trade_ Address. Line Two. Text Trade_ Address. Line Three. Text Trade_ Address. Line Four. Text Trade_ Address. Line Five. Text Trade_ Address. Street Name. Text Trade_ Address. City Name. Text Trade_ Address. City Sub-Division Name. Text Trade_ Address. Country. Identifier Trade_ Address. Country Name. Text Trade_ Address. Country Sub-Division. Identifier Trade_ Address. Country Sub-Division Name. Text			**3-1 Exporter agent (name and address)** TDED 3196: Name and address of a party authorised to act on behalf of another party. an..512 (Min = 0, Max = 1)	
UNeDocs_ Ship BIM. Specified. Supply Chain_ Consignment Supply Chain_ Consignment. Included. Supply Chain_ Consignment Item	Supply Chain_ Consignment Item. Sequence. Numeric			**12 Line item** TDED 1082: An identifier differentiating an individual line item from within a series an..6 (Min = 1, Max = unbounded)	
UNeDocs_ Ship BIM. Specified. Supply Chain_ Consignment Supply Chain_ Consignment. Included. Supply Chain_ Consignment Item	Supply Chain_ Consignment Item. Type. Code			**14 Commodity code** TDED 7133: Code qualifying a type of product details. an..3 (Min = 1, Max = 1)	

ASBIE	BBIE	SC	Certificate of Origin A Certificate of Origin certifies expressly that the goods to which the certificate relates originate in a specific country. Department of Foreign Trade, Ministry of Commerce, Thailand	Permit for the Export of Rice (A. 4) Permit for the Export of Rice (A. 4) is only given to rice exporters who follow the Ministry of Commerce's Regulation for Rice Exportation 1997. Department of Foreign Trade, Ministry of Commerce, Thailand	Certificate of Standards of Products (MS. 24) Certificate of Standards of Products (MS. 24) certifies that the rice to be exported has the quality set by importer. Board of Trade of Thailand
UNeDocs_ Ship BIM. Specified. Supply Chain_ Consignment Supply Chain_ Consignment. Included. Supply Chain_ Consignment Item	Supply Chain_ Consignment Item. FOB. Amount	Amount Currency. Identifier		**17 Price (FOB)** TDED 5032: Amount declared for customs purposes of those goods in a consignment which are subject to the same customs procedure, and have the same tariff/statistical heading, country information and duty regime n..18 (Min = 1, Max = unbounded)	**13 FOB Amount** TDED 5032: Amount declared for customs purposes of those goods in a consignment which are subject to the same customs procedure, and have the same tariff/statistical heading, country information and duty regime n..18 (Min = 1, Max = unbounded)
UNeDocs_ Ship BIM. Specified. Supply Chain_ Consignment Supply Chain_ Consignment. Included. Supply Chain_ Consignment Item	Supply Chain_ Consignment Item. Gross Weight. Measure	Measure Unit. Code	**11 Gross weight** TDED 6292: Weight (mass) of goods including packaging but excluding the carrier's equipment. n..14 (Min=1, Max= unbounded)		
UNeDocs_ Ship BIM. Specified. Supply Chain_ Consignment Supply Chain_ Consignment. Included. Supply Chain_ Consignment Item	Supply Chain_ Consignment Item. Net Weight. Measure	Measure Unit. Code		**15 Net weight** TDED 6016: Weight (mass) of goods item excluding all packing n..16 (Min = 1, Max = unbounded)	**12 Net weight** TDED 6016: Weight (mass) of goods item excluding all packing n..16 (Min = 1, Max = unbounded)
UNeDocs_ Ship BIM. Specified. Supply Chain_ Consignment Supply Chain_ Consignment Item. Nature Identification. Transport_ Cargo	Transport_ Cargo. Identification. Text		**10-2 Description of goods** TDED 7002: Plain language description of the nature of a goods item sufficient to identify it for customs, statistical or transport purposes an..512 (Min=1, Max= unbounded)	**13 Description of goods** TDED 7002: Plain language description of the nature of a goods item sufficient to identify it for customs, statistical or transport purposes an..512 (Min = 1, Max = unbounded)	
UNeDocs_ Ship BIM. Specified. Supply Chain_ Consignment Supply Chain_ Consignment. Included. Supply Chain_ Consignment Item Supply Chain_ Consignment Item. Physical. Logistics_ Shipping Marks	Logistics_ Shipping Marks. Marking. Text		**9 Marks and numbers on packages** TDED 7102: Marks and numbers identifying individual packages an..512 (Min=1, Max= unbounded)		**18 Marks and numbers on packages** TDED 7102: Marks and numbers identifying individual packages an..512 (Min = 1, Max = unbounded)

ASBIE	BBIE	SC	Certificate of Origin A Certificate of Origin certifies expressly that the goods to which the certificate relates originate in a specific country. Department of Foreign Trade, Ministry of Commerce, Thailand	Permit for the Export of Rice (A. 4) Permit for the Export of Rice (A. 4) is only given to rice exporters who follow the Ministry of Commerce's Regulation for Rice Exportation 1997. Department of Foreign Trade, Ministry of Commerce, Thailand	Certificate of Standards of Products (MS. 24) Certificate of Standards of Products (MS. 24) certifies that the rice to be exported has the quality set by importer. Board of Trade of Thailand
UNeDocs_ Ship BIM. Specified. Supply Chain_ Consignment Supply Chain_ Consignment. Included. Supply Chain_ Consignment Item Supply Chain_ Consignment Item. Transport. Logistics_ Package	Logistics_ Package. Gross Weight. Measure	Measure Unit. Code			**16 Gross weight - package** TDED 6022: Weight (mass) of a package excluding all packing n..16 (Min = 1, Max = unbounded)
UNeDocs_ Ship BIM. Specified. Supply Chain_ Consignment Supply Chain_ Consignment. Included. Supply Chain_ Consignment Item Supply Chain_ Consignment Item. Transport. Logistics_ Package	Logistics_ Package. Net Weight. Measure	Measure Unit. Code			**15 Net weight - package** TDED 6026: Weight (mass) of a package including all packing n..16 (Min = 1, Max = unbounded)
UNeDocs_ Ship BIM. Specified. Supply Chain_ Consignment Supply Chain_ Consignment. Included. Supply Chain_ Consignment Item Supply Chain_ Consignment Item. Included. Supply Chain_ Trade Line Item Supply Chain_ Trade Line Item. Specified. Trade_ Product	Trade_ Product. Name. Text				**9 Product name** TDED 7134: Name identifying a product. an..35 (Min = 1, Max = 1)
UNeDocs_ Ship BIM. Specified. Supply Chain_ Consignment Supply Chain_ Consignment. Included. Supply Chain_ Consignment Item Supply Chain_ Consignment Item. Included. Supply Chain_ Trade Line Item Supply Chain_ Trade Line Item. Specified. Trade_ Product Trade_ Product. Applicable. Product_ Characteristic	Product_ Characteristic. Description. Text				**10 Product type** TDED 7036: Free form description of a characteristic. an..35 (Min = 1, Max = 1)

ASBIE	BBIE	SC	Certificate of Origin A Certificate of Origin certifies expressly that the goods to which the certificate relates originate in a specific country. Department of Foreign Trade, Ministry of Commerce, Thailand	Permit for the Export of Rice (A. 4) Permit for the Export of Rice (A. 4) is only given to rice exporters who follow the Ministry of Commerce's Regulation for Rice Exportation 1997. Department of Foreign Trade, Ministry of Commerce, Thailand	Certificate of Standards of Products (MS. 24) Certificate of Standards of Products (MS. 24) certifies that the rice to be exported has the quality set by importer. Board of Trade of Thailand
UNeDocs_ Ship BIM. Specified. Supply Chain_ Consignment Supply Chain_ Consignment. Included. Supply Chain_ Consignment Item Supply Chain_ Consignment Item. Associated. Referenced_ Document	Referenced_ Document. Issuer Assigned_ Identification. Identifier		**12-2 Invoice no.** TDED 1334: Reference number to identify an invoice an..35 (Min=0, Max= unbounded)		
UNeDocs_ Ship BIM. Specified. Supply Chain_ Consignment Supply Chain_ Consignment. Included. Supply Chain_ Consignment Item Supply Chain_ Consignment Item. Associated. Referenced_ Document	Referenced_ Document. Issue. Date Time		**12-1 Invoice date** TDED 2377: Date of issue of an invoice an..19 (Min=0, Max= unbounded)		
UNeDocs_ Ship BIM. Specified. Supply Chain_ Consignment Supply Chain_ Consignment. At Departure. Logistics_ Transport Movement	Logistics_ Transport Movement. Mode. Text		**3-2 Mode of transport** TDED 8066: Name of a mode of transport an..17 (Min=1, Max=1)	**9-2 Mode of transport** TDED 8066: Name of a mode of transport an..17 (Min = 1, Max = 1)	
UNeDocs_ Ship BIM. Specified. Supply Chain_ Consignment Supply Chain_ Consignment. At Departure. Logistics_ Transport Movement	Logistics_ Transport Movement. Identification. Identifier		**3 Vessel/flight no.** TDED 8028: To identify a journey of a means of transport, for example voyage number, flight number, trip number an..17 (Min= 0, Max=1)	**10 Vessel/flight no.** TDED 8028: To identify a journey of a means of transport, for example voyage number, flight number, trip number an..17 (Min = 0, Max = 1)	
UNeDocs_ Ship BIM. Specified. Supply Chain_ Consignment Supply Chain_ Consignment. At Departure. Logistics_ Transport Movement Logistics_ Transport Movement. Loading. Transport_ Event	Transport_ Event. Estimated_ Occurrence. Date Time				**19 Loading date** TDED 2347: Date and optionally time when a consignment is to be or has been loaded onto a means of transport an..19 (Min = 1, Max = 1)

ASBIE	BBIE	SC	Certificate of Origin A Certificate of Origin certifies expressly that the goods to which the certificate relates originate in a specific country. Department of Foreign Trade, Ministry of Commerce, Thailand	Permit for the Export of Rice (A. 4) Permit for the Export of Rice (A. 4) is only given to rice exporters who follow the Ministry of Commerce's Regulation for Rice Exportation 1997. Department of Foreign Trade, Ministry of Commerce, Thailand	Certificate of Standards of Products (MS. 24) Certificate of Standards of Products (MS. 24) certifies that the rice to be exported has the quality set by importer. Board of Trade of Thailand
UNeDocs_ Ship BIM. Specified. Supply Chain_ Consignment Supply Chain_ Consignment. At Departure. Logistics_ Transport Movement Logistics_ Transport Movement. Departure. Transport_ Event Transport_ Event. Occurrence. Logistics_ Location	Logistics_ Location. Name. Text		**4 Place of departure** TDED 3214: Name of the port, airport or other type of location from which a means of transport is scheduled to depart or has departed an.. 256 (Min=1, Max=1)	**11 Place of departure** TDED 3214: Name of the port, airport or other type of location from which a means of transport is scheduled to depart or has departed an.. 256 (Min = 1, Max = 1)	**20 Place of departure** TDED 3214: Name of the port, airport or other type of location from which a means of transport is scheduled to depart or has departed an.. 256 (Min = 1, Max = 1)
UNeDocs_ Ship BIM. Specified. Supply Chain_ Consignment Supply Chain_ Consignment. Origin. Trade_ Country	Trade_ Country. Name. Text		**13-1 goods originate in:** TDED 3238: Name of the country in which the goods have been produced or manufactured, according to criteria laid down for the purposes of application of the Customs tariff, of quantitative restrictions, of any other measure related to trade. an..35 (Min=1, Max= 1)		
UNeDocs_ Ship BIM. Specified. Supply Chain_ Consignment Supply Chain_ Consignment. Final_ Destination. Trade_ Country	Trade_ Country. Name. Text		**7 Country of destination of goods** TDED 3014: Name of the country to which a consignment of goods is to be or has been delivered. an..35 (Min=1, Max=1)	**5 Destination country** TDED 3216:Name of the country to which the goods are to be delivered to the final consignee or buyer an..35 (Min = 1, Max = 1)	**21 Country of destination of goods** TDED 3014: Name of the country to which a consignment of goods is to be or has been delivered. an..35 (Min = 1, Max = 1)
UNeDocs_ Ship BIM. Specified. Supply Chain_ Consignment Supply Chain_ Consignment. Associated. Cross-Border_ Customs Procedure	Cross-Border_ Customs Procedure. Information. Text			**6 For Customs** TDED 4440: Free form text. an..512 (Min = 0, Max = 1)	
UNeDocs_ Ship BIM. Specified. Supply Chain_ Consignment Supply Chain_ Consignment. Applicable. Trade_ Currency Exchange	Trade_ Currency Exchange. Source Currency. Code			**7 Currency** TDED 6343: Code specifying a type of currency. an..3 (Min = 1, Max = 1)	

ASBIE	BBIE	SC	Certificate of Origin A Certificate of Origin certifies expressly that the goods to which the certificate relates originate in a specific country. Department of Foreign Trade, Ministry of Commerce, Thailand	Permit for the Export of Rice (A. 4) Permit for the Export of Rice (A. 4) is only given to rice exporters who follow the Ministry of Commerce's Regulation for Rice Exportation 1997. Department of Foreign Trade, Ministry of Commerce, Thailand	Certificate of Standards of Products (MS. 24) Certificate of Standards of Products (MS. 24) certifies that the rice to be exported has the quality set by importer. Board of Trade of Thailand
UNeDocs_ Ship BIM. Specified. Supply Chain_ Consignment Supply Chain_ Consignment. Related. Supply Chain_ Trade Transaction Supply Chain_ Trade Transaction. Applicable. Supply Chain_ Trade Agreement Supply Chain_ Trade Agreement. Buyer. Trade_ Party	Trade_ Party. Name. Text			**4-1 Buyer (<u>name</u> and address)** TDED 3002: Name and address of a party to which merchandise or services are sold. an..512 (Min = 0, Max = 1)	
UNeDocs_ Ship BIM. Specified. Supply Chain_ Consignment UNeDocs_ Ship BIM. Specified. Supply Chain_ Consignment Supply Chain_ Consignment. Related. Supply Chain_ Trade Transaction Supply Chain_ Trade Transaction. Applicable. Supply Chain_ Trade Agreement Supply Chain_ Trade Agreement. Buyer. Trade_ Party Trade_ Party. Postal. Trade_ Address	Trade_ Address. Postcode. Code Trade_ Address. Line One. Text Trade_ Address. Line Two. Text Trade_ Address. Line Three. Text Trade_ Address. Line Four. Text Trade_ Address. Line Five. Text Trade_ Address. Street Name. Text Trade_ Address. City Name. Text Trade_ Address. City Sub-Division Name. Text Trade_ Address. Country. Identifier Trade_ Address. Country Name. Text Trade_ Address. Country Sub-Division. Identifier Trade_ Address. Country Sub-Division Name. Text			**4-1 Buyer (name, <u>address, and country</u>)** TDED 3002: Name and address of a party to which merchandise or services are sold. an..512 (Min = 0, Max = 1)	
UNeDocs_ Ship BIM. Specified. Supply Chain_ Consignment Supply Chain_ Consignment. Related. Supply Chain_ Trade Transaction Supply Chain_ Trade Transaction. Applicable. Supply Chain_ Trade Agreement Supply Chain_ Trade Agreement. Agreed Price_ Product. Trade_ Price	Trade_ Price. Unit. Amount	Amount Currency. Identifier		**16 Unit price** TDED 5110: Price per unit of quantity on which an article item amount is calculated n..18 (Min = 1, Max = unbounded)	**17 Unit price** TDED 5110: Price per unit of quantity on which an article item amount is calculated n..18 (Min = 1, Max = unbounded)

Recommendations
APEC Symposium on Data Harmonization
Towards Single Window Paperless Environment
January 19 – 20, 2009; Bangkok, Thailand

1. Participants recall that APEC Ministers endorsed APEC's Strategies and Actions toward a Cross-Border Paperless Trading Environment to enable the electronic transmission of trade-related information within each economy by 2010 and across the region by 2020.[1]

2. In order to achieve cross-border electronic transmission of trade-related information, the participants recognize the need of semantic interoperability of information systems operating on different platforms globally.

3. The participants recognize that semantic interoperability of information systems for trade and transport facilitation operating on different platforms can be achieved by harmonizing and standardizing international trade and transport documents with one single reference information framework which covers B2B, B2G, G2G, and G2B data requirements of the international supply chain.

4. The participants recognize the role of the government and business sector in the data harmonization initiative and that government policy and top and middle-level government support are crucial to push forward the initiative. The participants also recognize the need for private sector involvement in the implementation as the majority of data exchanged in the international supply chain are originated from the trade and transport community.

5. The participants note the important contribution that UN/CEFACT, through its International Trade and Business Processes Group, is making in developing the data model Buy-Ship-Pay UN/CEFACT Business Standard Subset for International Trade including UNeDocs, which could support the alignment of data requirements for paper and electronic information exchange across the international supply chain.[2] The participants also note that the WCO has developed WCO data model for harmonizing and standardizing data requirements between G2G, G2B, and B2G.

6. The participants take note of the successful implementation of the Buy-Ship-Pay including UNeDocs data model in the following projects:
    - APEC pathfinder initiative on Electronic Certificate of Origin
    - EU-Australia Transatlantic Project on the exportation of wine from Australia to EU
    - IATA e-Freight and e-Shippers Declaration for Dangerous Goods

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[1] Joint Statement, 16th APEC Ministerial Meeting, Chile, 17-18 November 2004
http://www.apec.org/apec/ministerial_statements/annual_ministerial/2004_16th_apec_ministerial.html
[2] The Buy-Ship-Pay including UNeDocs data model is based on CCL08B which is being developed in line with the Core Component Technical Specification (CCTS) version 2.01 standard. Several UN/CEFACT working groups have provided data requirements necessary for the development of the Buy-Ship-Pay including UNeDocs data model to ensure proper integration of data requirements and G2G, G2B, B2G, B2B information exchange. While the semantic rules that Buy-Ship-Pay including UNeDocs provides are contextualized for the automation of documentary requirements across the international supply chain, their generality in the meantime allows the application of business rules that may vary depending on stakeholders' needs. This is still a 'work-in-progress'.

- The harmonization of 6,765 data elements used in 189 documents by trade and transport related regulatory agencies in Thailand, reducing the number of data elements to 259.

7. The participants recommend that the Buy-Ship-Pay including UNeDocs data model, once finalized, be considered as one of potential reference information frameworks for data harmonization in Asia and the Pacific region.

8. Although the Buy-Ship-Pay including UNeDocs data model has now completed its Implementation Verification phase (ODP 6) under the UN/CEFACT Open Development Process (ODP)[3], its Final Publication (ODP 7) has not taken place. The participants share the opinion that an update on BSP UNeDocs development from UN/CEFACT would be appreciated by relevant stakeholders.

9. The participants support the initiative of UNESCAP and UNECE to build a regional Network of Experts (UN NExT) to further enhance capacity and knowledge for the implementation of national and regional initiatives for trade facilitation and paperless trade. They encourage Government agencies and national and regional projects to support this initiative, to actively participate in this network and to share their experiences and know-how with experts from other economies in the region.

10. The participants suggest that the train-the-trainer workshop on Data Harmonization be implemented in APEC member economies. The participants also request that APEC develops an awareness program for decision-makers and capacity building on data harmonization for middle-level government officials.

11. The participants suggest that APEC drives the development of a data harmonization roadmap with an inclusion of business process modeling and analysis of core business process associated with the international supply chain as the instrument to communicate better operational aspect of business domains.

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[3] UN/CEFACT Open Development Process ,
http://www.unece.org/cefact/cf_plenary/plenary07/trd_R650_Rev4_A1E.pdf