Asia-Pacific
Economic Cooperation

APEC e-Trade Hub Reference Model Design and Development

Final Report

APEC Electronic Commerce Steering Group
APEC Committee on Trade and Investment

Moscow
July, 2008

APEC PROJECT
Development of "APEC Guidance for Electronic Commerce", Using the Best Practices of E-government Procurement Systems" Stage 2 **ECSG 06/2008T**

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APEC#208-CT-01.4

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Abstract

Transborder e-Trade changes the way in which enterprises, including SME, perform trade transactions. The assignment of business roles to parties involved in e-trade may differ significantly from a traditional paper-trade process. This report presents a reference model that serves to provide insight in the roles and functions that are needed to make this possible. Such a model facilitates the Service Oriented Architecture (SOA) implementation and reuse of existing components and applications, and may also provide guidelines for outsourcing of different e-Trade functions. As an illustration of the reference model, a number of models and architectures developed by UN/CEFACT and WCO are described in more detail. This report is an outcome of APEC project numbered ECSG 06/2008T.

Keywords: e-Trade, paperless trade, transborder trade facilitation, reference model, APEC, UNeDocs, Single Window, e-Business Architecture.

List of Abbreviations

ACN	Association for Cooperation with Nations of Asia and the Pacific
APEC	Asian Pacific Economic Cooperation
ASEAL	Asia Europe Alliance for Paperless Trade
ASEAN	Association of Southeast Asian Nations
ASP	Application Service Provider
ASYCUDA	Automated System for Customs Data
B2B	Business-to-Business
BPI	Business Process Interconnect
C2B	Citizen-to-Business
C2C	Citizen-to-Citizen
CA	Certification Authority
CCTS	[UN/CEFACT] Core Components Technical Specification
CIS	Commonwealth of Independent States (Union of former USSR republics)
CO	Certificate of Origin
CTI	[APEC] Committee on Trade and Investment
DG	Dangerous Goods
EC	European Council
eccma	Electronic Commerce Code Management Association
e-Commerce	Electronic Commerce
ECOTECH	[APEC] Economic and Technical Cooperation
ECSG	[APEC] E-Commerce Steering Group,
EDI	Electronic Data Interchange
e-GP	e-Government Procurement
E-payment	electronic payment
ETA	Expected Time of Arrival
ETD	Expected Time of Departure
EU	European Union

FAL	[International Maritime Organization] Trade Facilitation Committee
FMA	Finnish Maritime Administration
FTP	File Transfer Protocol
G2B	Government-to-Business
G2G	Government-to-Government
GBD	Global Business Dialogue (on Electronic Commerce)
GPEG	[APEC CTI] Government Procurement Experts' Group
GST	Goods and Services Tax
GTS	Global Trade Server
ICC	International Chamber of Commerce
ICO	International Customs Organization
ICT	Information and Communication Technologies
IMDG	International Maritime Dangerous Goods
IMO	International Maritime Organization
ISP	Internet Service Provider
ISPS	International Ship and Port Facility Security Code
IT	Information Technologies
ITPWG-TBG15	[UN/CEFACT] International Trade Procedures Working Group
NAFTA	North American Free Trade Agreement
NECS	National Electronic Commerce System
OAA	Osaka Action Agenda
PAA	Pan Asian e-Commerce Alliance
PGA	Participating Government Agencies
PKI	Public Key Infrastructure
PPP	Private-Public Partnership
R&D	Research and Development
SCCP	[APEC CTI] The Sub-Committee on Customs Procedures
SME	Small and Medium Enterprises
SMEWG	[APEC CTI] Small and Medium Enterprises Working Group
SOA	Service Oriented Architecture
SPS	Sanitary and Phytosanitary
SW	Single Window

SWWG	[APEC CTI SCCP] Single Window Working Group
TDED	Trade Data Element Directory (ISO 7372)
TTP	Trusted Third Party
UMM	[UN/CEFACT] Modeling Methodology
UN/CEFACT	UNITED NATIONS/CENTRE FOR TRADE FACILITATION AND ELECTRONIC BUSINESS
UNCITRAL	United Nations Commission on International Trade Law
UNCTAD	UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT
UNECE	United Nations Economic Commission for Europe
UNeDocs	United Nations electronic Trade Documents

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EXECUTIVE SUMMARY

Project Purpose: The main purpose of the project was to make Reference Model of Paperless Trading Hub. For this terms of reference for EC system design and development tool kit, created on previous stage of the project, as well as data on principles of operations of China's Paperless Trading Digital Bridge and E-Port, Republic of Korea's u-Trade Hub, China Hong Kong Single Window Initiatives and Russian "B2B-energo" international e-trade hub will be used. The Reference Model will foster cooperative realization by APEC economies of eTradeHub, promote increase of the goods international turnover, small and medium enterprises role growth in international trade and eliminate gender and other social barriers for participation in international trade in APEC economies.

Principal activities: This project covered for 10 months in parallel two activities: 1) collection and processing of data on principles of operations of China's Paperless Trading Digital Bridge and E-Port, Republic of Korea's u-Trade Hub, China Hong Kong Single Window Initiatives and Russian "B2B-energo" international e-trade hub 2) writing and tuning Reference Model of Paperless Trading Hub. The 2-days Conference hosted in China was held in November, 2008 and aimed to discuss draft proposal of this Reference Model and the next stage of the cooperative action project.

* * *

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Introduction

This project ("Reference Model of Paperless Trading Hub[1] Design and Development", Stage 2, 2008) is the continuation of the project Stage 1 in 2006 which was aimed to formulate terms of reference for "APEC Toolkit for EC system" and ended successfully with outcome needed for this project.

Project Objectives

This project directly responds to the priorities set by APEC Leaders and Ministers. The outcomes of the Project 1st Stage were represented to and discussed by the interested participants of ECSG and its Sub-Group's Meetings in Canberra in January 2007. They approved outcomes of 1st Stage and acknowledged the need to work on the next Stage of the Project. Following stage 2 is stage 3 (2009-2010) project for cooperative creation by APEC economies of eTradeHub. This target conforms to Objectives stated in "APEC's Strategies and Actions toward a Cross-Border Paperless Trading Environment" by Electronic Commerce Steering Group, September 30, 2004:

- Till 2010 "Most member economies establishes a domestic paperless trading environment and implement pilots for the cross-border electronic transmission of customs clearance data".

Also, one of the project objectives is to design and develop an APEC Reference Model of Transborder Paperless Trading Hub, which will correspond with the following strategy, declared in the above mentioned document:

- Cooperate with international organizations to pursue common standards and procedures, elements, formats and interoperability frameworks.

Reference model is now the widespread approach for definition of complex "thing" in real life for organization of cooperative enforcement. For reference, first such technical model was approved by ISO as international standard in 1978 for Open Systems Interconnection and this model is up to now in use for information and telecommunications networks protocols and interfaces cooperative design and development and creation of telecommunications networks in

[1] Also named sometimes e-Trade hub

countries all over the world – here lies technical assistance and capacity building for all ISO members.

For matching business and technical features of information systems, a new kind of reference model – enterprise architecture – is used now. Such kind of reference model, for instance, is used by Canadian Government (http://www.tbs-sct.gc.ca/inf-inf/index_e.asp). Its Enterprise Architecture and Standards Division (IASD) leads the design, development and implementation of the Government of Canada's (GC) enterprise architecture (EA), a framework of principles, standards and practices used to guide the design and implementation of service transformation and IM/IT initiatives. In addition, IASD supports functions of the Treasury Board Secretariat – technical assistance and capacity building for all Canadian Government bodies lies here.

Conceptually the same kind of reference model (EA) but for a single e-Trade hub developed, shared and used by all APEC economies for international paperless trade between them is proposed in this project -- technical assistance and capacity building for all APEC economies lies here.

E-Trade hub is not only for e-government and business procurement, but for commercial international supply chains also. The developed reference model clearly shows in what matters APEC economies already have compatibility (if any) and in what matters they should seek compatibility to make international e-trade real. E-Trade hub reference model will be the ground for long-term APEC economies Cooperative Action Plan to build real e-Trade hub information system with first test bed demonstration in app. 2012 and full scale operation by 2020. All economies will benefit from the reference model and start-up of e-Trade hub operation.

Workshops and seminars perhaps are good, but nobody has never heard about information systems developed at the seminar, may be only specified. So, this project is aimed not only at the knowledge distribution at seminars, but at the collective work and development of real information system for e-Trade shared by all APEC economies.

On November 19, 2006 in Ha Noi, APEC Economic Leaders endorsed “Ha Noi Action Plan to IMPLEMENT THE BUSAN ROADMAP TOWARDS THE BOGOR GOALS”. It contains APEC E-commerce Schedule of Activities:

Elements	On-going Actions	Future Actions	Timeframe	Capacity-building
Strengthening the regulatory environment for e-	Implementation of Blueprint for E-commerce and	Promote trust and confidence through the cooperation	2007-2008	1.Training in e-commerce

Elements	On-going Actions	Future Actions	Timeframe	Capacity-building
commerce	Privacy Framework	with Global Trustmark Alliance (GTA) and ASEAN Trustmark Alliance (ATA)		2. Enhance consumer and business awareness
Best practices in conducting e-commerce	1. Implement e-tender method for government procurement in member economies 2. Offer services of problem mediation related to online transaction by e-commerce complaint handling center	Establish the cooperation with potential partners to enhance e-commerce and e-trade services	2008	1. Technical assistance for technological infrastructure improvement (internet, broad band etc.) 2. Training on information security and information security management

The project had strived to exercise future actions defined in the above action plan.

The tasks to be fulfilled during the Project implementation are broken into 3 stages:

Stage 2. Reference Model of Paperless Trading Hub Design and Development.

Stage 3. Cooperative creation by APEC economies of eTradeHub for paperless trade in the APEC region.

Project key objectives of the Stage 2:

1. To collect and process data on principles of operations of China’s Paperless Trading Digital Bridge and E-Port, Republic of Korea's u-Trade Hub, China Hong Kong Single Window Initiatives and Russian “B2B-energo” international e-trade hub.
2. To write and tune Reference Model of Paperless Trading Hub Design and Development for APEC economies based on data collected and processed on Stage 1.

3. To report draft proposal of Reference Model of Paperless Trading Hub Design and Development at the Conference to be held in November, 2008 in China with following it's review and approval by ECSG members.

Assessment. The following table indicates assessments for current Stage 2 of the Project:

Project objective	Current status	End-of-project target.
To collect and process data on principles of operations of China's Paperless Trading Digital Bridge and E-Port, Republic of Korea's u-Trade Hub, China Hong Kong Single Window Initiatives and Russian "B2B-energo" international e-trade hub	Such activity was not performed yet at multi-national level.	Comparative table of China's Paperless Trading Digital Bridge and E-Port, Republic of Korea's u-Trade Hub, China Hong Kong Single Window Initiatives and Russian "B2B-energo" international e-trade hub features
To write and tune Reference Model of Paperless Trading Hub Design and Development for APEC economies based on data collected and processed on Stage 1.	N/A	Draft Proposal of Reference Model of Paperless Trading Hub Design and Development for APEC economies.
To report draft proposal of Reference Model of Paperless Trading Hub Design and Development at the Conference to be held in August, 2008 in China with following it's review and approval by ECSG members.	N/A	Reference Model of Paperless Trading Hub Design and Development reviewed and approved by ECSG members

Intended beneficiaries of the project

Below is the list of the project's intended beneficiaries:

- Businesses, small and medium sized;
- Governmental regulating authorities;
- Public sector.

Special group of beneficiaries of the project are small and medium sized enterprises headed by women. In developing economies women now often take positions of senior managers of SME enterprises both in production and in sales and marketing. Application of e-commerce systems to develop business of SME enterprises gives to women additional opportunities to participate in processes of international trade and to expand business contacts with companies in other economies. This allows women-managers to extend their experience in business, improve their understanding of international processes in production, logistic, sales and marketing and thus to develop and increase their business more successfully.

Project outputs and how these outputs will benefit the targeted beneficiaries.

Reference Model of Paperless Trading Hub Design and Development will allow obtaining the following results:

- Business, especially small and medium sized, will be aware of near possibilities to be connected to APEC economies e-markets.

- Governmental regulating authorities will be able to provide international paperless trade with regulation. Organizations responsible for governmental procurement system will receive the possibility to connect to international e-markets.

- Public sector will see a spur in international trade growth.

The development of Reference Model of Paperless Trading Hub Design and Development in APEC economies:

- will reduce the risks in creating similar systems, taking into account regional specifics;

- will assist in simplifying the conditions for integration of APEC economies into current international system of e-trade at the earliest stage;

- will help highlight the potential to reduce costs by cooperative implementation of eTradeHub by APEC economies.

How this project will contribute to the APEC Trade and Investment Liberalization and Facilitation.

The project aims to assist APEC Member Economies to meet free trade and investment liberalization goals. The project objectives relate with the following statements made in Section C, Part ONE of Osaka Action Agenda:

Section, Issue, OAA Statement	**Project contribution**
3. SERVICES	
OBJECTIVE	
a. progressively reducing restrictions on market access for trade in services.	Transparency principles to be studied aim to exactly reduce restrictions on market access.
b. providing, in regulated sectors, for the fair and transparent development, adoption and application of regulations and regulatory procedures for trade in services.	Expected project results will support APEC economies' officials with guidance on how to incarnate transparency principles in regulatory procedures.
TELECOMMUNICATIONS	
a. work to bridge the digital divide at the domestic, regional and global levels, and to cooperate and collaborate with the business/private sector in this effort.	The Stage 3 of proposed project aims to provide cooperation among APEC economies in creation of eTradeHub.
b. foster discussion between business/private sector and governments on appropriate means to assess and reward the value of products and services exchanged in the provision of converged Internet services among APEC economies…	The Stage 1 of proposed project is to develop of "APEC Guidance for Electronic Commerce" which aims to clarify approaches could be used to access and reward the value of products and services exchanged in e-commerce system which for theirs parts mostly are based on Internet.
e. work to ensure that policy and regulatory environments better foster the uptake of e-commerce.	The research of current policy and regulatory environments and extracting their best practices is a part of such work.
g. give attention to user requirements for open standards and systems to support interoperability.	As mentioned above, one of the project targets is to provide guidance on cooperation. End-user requirements will be studied and included as a part of research.

The project supports implementation of the following General Principles provided in the Osaka Action Agenda:

- Non-discrimination - reductions in barriers to trade achieved through APEC are available to all APEC Member Economies as well as to non-APEC Economies.
- Transparency - the laws, regulations and administrative procedures in all APEC Member Economies which affect the flow of goods, services and capital among APEC Member Economies are transparent.
- Flexibility - APEC Member Economies deal with the liberalization and facilitation process in a flexible manner, taking into account differing levels of economic development.
- Cooperation - Economic and technical cooperation contributing to liberalization and facilitation is actively pursued.

All these principles are mostly implemented in e-Procurement systems and project objective is to discover best practices of such implementation and to offer them (practices) as Reference Model of Paperless Trading Hub Design and Development.

So 2nd Stage of the Project meets the TILF requirements. 2nd Stage of the Project intends to generalize the experience of APEC member economies in paperless trading and to disseminate the findings and recommendations of the best practices among APEC member economies. The design of reference model of course will be created on the basis of generalized experience of APEC member economies and supposes to create such a model, the architecture and main elements of which could be applicable in different APEC member economies.

Sixteen economies have already prepared Paperless Trading Individual Plans. These Plans outline the steps they should take to meet APEC target to reduce or eliminate customs, cross-border trade administration and other documents relevant to international sea, air and land transport.

On the 2nd Stage of the Project:

- data on principals of operations of China's PAPERLESS TRADING DIGITAL BRIDGE AND E-PORT, Republic of Korea's U-TRADE HUB, China Hong Kong SINGLE WINDOW INITIATIVE and Russia's B2B-ENERGO INTERNATIONAL E-TRADE HUB (among others) were collected and processed and
- generalizing reference model of E-Trade Hub was designed and developed.

The Project outcomes could be adopted as a reference model of E-Trade Hub in the enterprise architecture style, which will be the framework for future design and development of E-Trade Hub standards and total solutions.

Linkages

The Project was consulted with the following APEC fora:

- SMEWG, GPEG and GFPN

Comments of these APEC fora were taken into account while realizing this project.

Active Participants. At all Project implementation Stages non-state organizations, industrial, regional business associations (first and foremost representatives of IT-business, e-commerce and e-trade), as well as Chambers of Commerce participated in it as the source of information and experts for creating a concept of Paperless Trading Hub design and development. At the 2nd Stage we invited lawyers (to modify legal basis) and representatives from industry (for implementation of the project). We also involved local officials and officials from other APEC economies into discussion on the results obtained in the Projects and on the principles of Paperless Trading Hub design developed within framework of the Project. Also the head experts of successful national projects on e-commerce (such as China's Paperless Trading Digital Bridge and E-Port, Republic of Korea's u-Trade Hub, China Hong Kong Single Window Initiatives, Russian B2B-energo) have taken active participation in this project giving their recommendations based on their positive experience.

Great influence on the project development exercised proceedings of the APEC-UN Joint Capacity Building Symposium on Paperless Trading (May 26-28 2008, Seoul, Korea, www.apecun-korea.org).

All project activities were based on gender equality approach. So, persons of two genders have taken responsibilities for different tasks of the project, depending on his/her competency and qualification only.

Project influence. It is expected that the project will have direct and indirect influence on other APEC projects as well as on some APEC activities. It will assist in overcoming digital divide, increasing export potential in APEC economies. Its realization is necessary for the representatives of small and medium sized businesses as it will lead to their expansion to national and global markets, as well as expand their participation in supplying for state needs. So, the Project will contribute to the following APEC Committees and Groups activities:

- *Committee on Trade and Investment* (CTI):

- *Small and Medium Enterprises Working Group* (SMEWG) - as one of the project beneficiaries is small and medium sized business, which will be given additional or modified opportunities to develop its participation in APEC economies;
- *Government Procurement Experts' Group* (GPEG) - as research on e-procurement systems in selected economies will indicate how ample and equal opportunities for participation to interested and qualified bidders for government work approached.
- *The Sub-Committee on Customs Procedures (SCCP, http://www.sccp.org/)*
  - *Single Window Working Group (SWWG)* -- provides a framework for the development of Single Window systems by members to achieve paperless trading targets and enable seamless data sharing. It contains six recommendations to assist members in this endeavor and provides the mechanisms for APEC members to work collaboratively and agree on various issues where appropriate.

Methodology

Tasks performed at the 2nd Stage of the project: (January, 2008 – December, 2008):

1) Determination of the borderlines of the project

- Setup main project targets and tasks;
- Define project limits.

2) Forming Technical Writers Group.

3) Preparation of the List of potential technological partners for delivery and discussion of data on principles of operations of China's Paperless Trading Digital Bridge and E-Port, Republic of Korea's u-Trade Hub, China Hong Kong Single Window Initiatives and Russian "B2B-energo" international e-trade hub.

4) Approval of work list with expert community in the economies that would provide for discussion on each sub-stage of the work while documenting the opinions of all experts.

5) Selection of technological partner for Reference Model of Paperless Trading Hub Design and Development review.

6) Chain of events development that would lead to result, taking into account the national specific.

7) Preparation of the Reference Model of Paperless Trading Hub Design and Development draft.

8) Review of Reference Model of Paperless Trading Hub Design and Development draft by technological partner

9) Preparation and holding of the conference, ensuring gender equity in selection of its consultants and participants.

10) Update of the Reference Model of Paperless Trading Hub Design and Development on the basis of conference recommendations.

11) Distribution of Reference Model of Paperless Trading Hub Design and Development draft to members of ECSG for review and approval

12) Collection of reviews and Reference Model update

13) Wrap up of the project

Upon completion of these works the Final Report was prepared, consisting of:

1. Report on the outcomes and difficulties of pilot integration.
2. Reference Model of Paperless Trading Hub Design and Development.

On this Stage of the project China and Vietnam participated in all project components:

Project activity	**China and Vietnam participated and contributed in the following project components review and approval**
To collect and process data on principles of operations of China’s Paperless Trading Digital Bridge and E-Port, Republic of Korea's u-Trade Hub, China Hong Kong Single Window Initiatives and Russian “B2B-energo” international e-trade hub	Comparative table of China’s Paperless Trading Digital Bridge and E-Port, Republic of Korea's u-Trade Hub, China Hong Kong Single Window Initiatives and Russian “B2B-energo” international e-trade hub features
To write and tune Reference Model of Paperless Trading Hub Design and Development for APEC economies based on	Draft Proposal of Reference Model of Paperless Trading Hub Design and Development for APEC economies.

Project activity	China and Vietnam participated and contributed in the following project components review and approval
data collected and processed on Stage 1.	
To report draft proposal of Reference Model of Paperless Trading Hub Design and Development at the Conference to be held in August, 2008 in China with following it's review and approval by ECSG members.	Reference Model of Paperless Trading Hub Design and Development reviewed and approved by ECSG members

Transborder e-Trade and e-Trade Hub Reference Model

Trade Facilitation

Trade Facilitation[2] is one of APEC's three main pillars of work to achieve the Bogor Goals of free and open trade and investment. As part of the Shanghai Accord, endorsed by Leaders in 2001, APEC Members agreed to reduce significantly transaction costs by five percent across the APEC region over the next five years. In 2002, Leaders and Ministers adopted the Trade Facilitation Action Plan, a framework for achieving the objectives of the Shanghai Accord. The Action Plan envisions APEC members implementing specific trade facilitating reforms, and estimating cost-savings that business will derive from their implementation. One of the four main categories for the reforms is electronic commerce, and includes measures related to authentication, cybersecurity, and the development of a portal of information on the legal, regulatory, and policy practices related to these issues in the APEC region.

In Fig 1 key stakeholders in trade facilitation are shown and in Fig. 2 -- main components of trade facilitation.

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[2] • APEC: "Trade facilitation generally refers to the simplification, harmonization, use of new technologies, and other measures to address procedural and administrative impediments to trade."

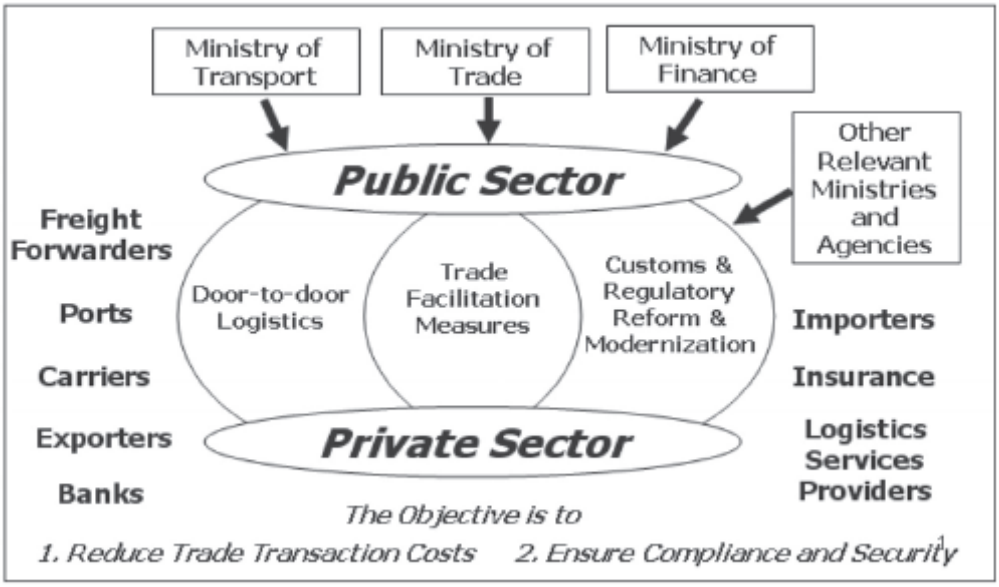
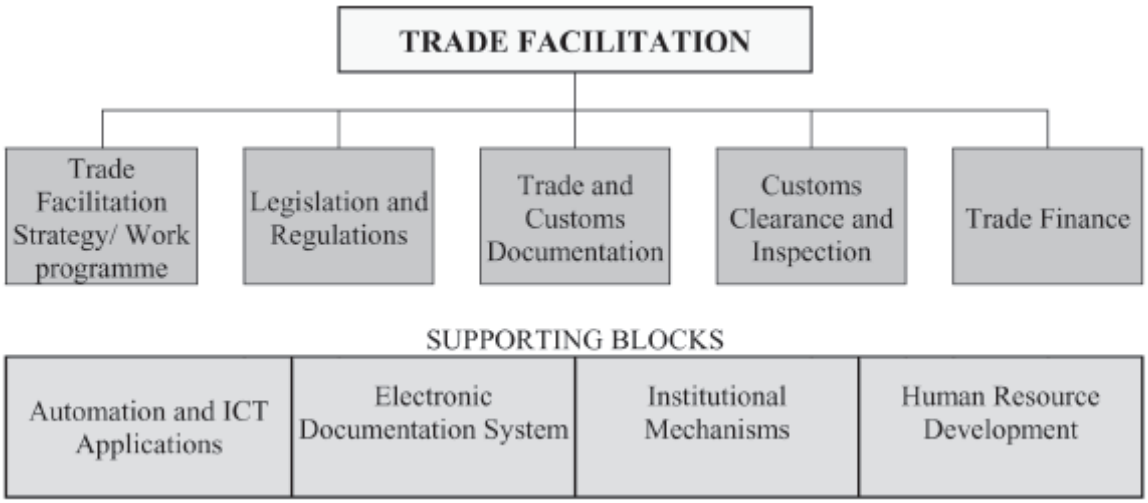


Fig. 1. Key stakeholders in trade facilitation. Source:
www.unescap.org/tid/publication/tipub2437_chap2.pdf



Fif. 2. Main components of trade facilitation. Source:
www.unescap.org/tid/publication/tipub2437_chap2.pdf

Trade in the Digital Economy.

Reflecting APEC's ongoing commitment to advancing and strengthening the information society, sixteen economies adopted the Leaders Statement to Implement APEC Policies on Trade and the Digital Economy in 2002. The Statement integrates requirements on services, intellectual property and tariffs into one agreement to promote trade in the digital economy in a cross-cutting

way. The agreement will be used to set trade policy targets in new areas important for ensuring the free flow of trade and investment in the digital economy and to strengthen e-commerce.

The general objectives of the Initiative entail liberalization and open trade policies leading to:

- greater development of e-commerce and economic growth
- promotion of market access and trade across sectors using electronic networks
- domestic regulation designed to be least restrictive to trade
- a long-term moratorium on customs duties on electronic transmissions
- support of demand-driven capacity building projects to ensure all economies benefit from the growth of the digital economy

Although not all APEC economies have agreed to the initiative, the sixteen signing economies are able to progress towards the goals of the Statement which may include, on a voluntary basis, the participation of the five non-signing economies.

Paperless Trading.

Paperless trade is overlap of e-commerce, e-government and international trade. In 1998, APEC economies committed to reduce or eliminate the requirement for paper documents needed for customs and other cross-border trade administration, where possible, by 2005 for developed and 2010 for developing economies (http://www.apec-iap.org/). APEC economies are working with business to facilitate paperless trading for cross-border transactions. Initiatives being introduced include:

- Electronic customs clearance systems
- Electronic cargo and port manifests
- Electronic carnets to facilitate the movement of samples for trade displays
- Electronic certificates of origin (ECO)
- Electronic Sanitary and Phytosanitary (SPS) Certification
- Electronic invoicing
- Single Window (SW)
- Customs documents harmonization

These initiatives realization is coordinated and planned by APEC *Committee on Trade and Investment* (CTI), t*he Sub-Committee on Customs Procedures (SCCP, http://www.sccp.org/)* and its *Single Window Working Group (SWWG).*

E-Trade stakeholders.

They are local, regional, global goods suppliers and buyers, including SME, public, executive, legislature and standardization bodies (Table 1).

Table 1. Processes, parties and procedures involved in international trade transaction. Source: ESCAPE secretariat, www.unescap.org/tid/publication/tipub2437_chap2.pdf

Processes	**Actors**	**Procedures**
Commercial	Buyer Seller	Establish contract
		Order goods
		Advice on delivery
		Request payment
Transport	Carriers	Establish transport contract
		Collect, transport and delivery goods
		Provide waybills/bills of lading, goods receipts, status report
Regulatory	Customs broker Customs and other border agencies, licensing authorities	Obtain licenses (import/export)
		Submit customs declaration and other related documents (such as carrier note, invoice, waybill/bill of lading, packing list, customs valuation form, certificate of origin, import license/export permit)
		Apply trade security/risk management procedures
		Clear goods for export/import
Financial	Insurance agents Banks	Provide credit rating/credit
		Arrange insurance
		Execute payment

Recently a lot of global, regional and professional international organizations fostered standardization of international trade procedures and data in parallel without any coordination. Let us look at them.

In the UNO system (Fig. 3) an active development is provided by UN/CEFACT, IMO, WTO, WIPO, UNCTAD and UNCITRAL (professional organizations) and Regional Economic

Commissions. Some professional organizations have a global nature and are independent of UN (WCO, for instance). Some countries are members of more then one regional organization (Fig.4-6) and professional organizations (WCO, WIPO, for instance). So it is difficult to trace activities on the same matter, say customs, in global, regional and professional international organizations. And it is unclear whether countries coordinate their activity on the same matter in different regional and professional organizations whose member they are.

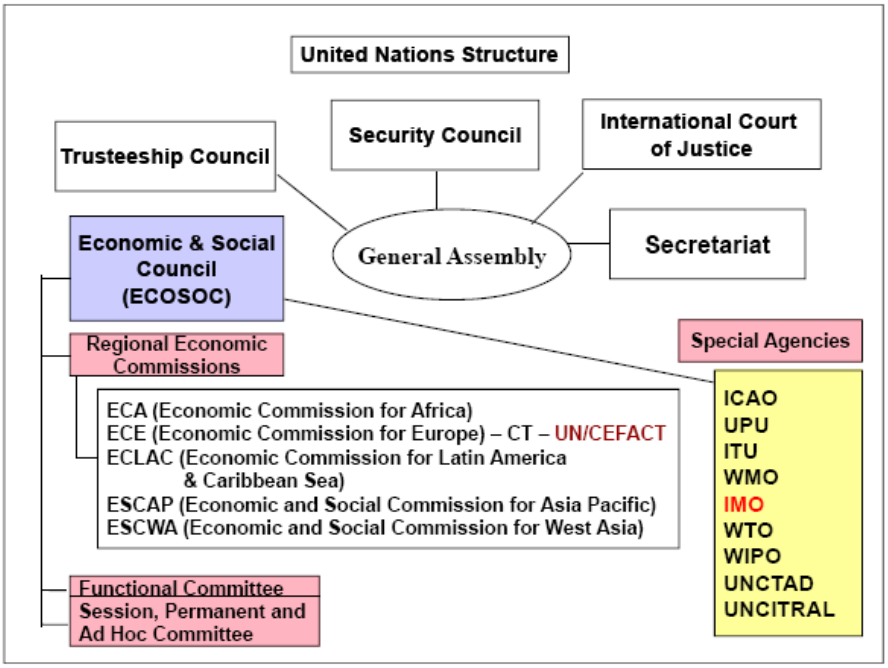


Fig. 3. UN system structure.

Digging deep into the state of the art of paperless transborder trade (e-Trade) standardization we have found two major leading international organizations on the same turf: UN/CEFACT and WCO. They are supported be ISO, and a plenty of regional, interregional and national e-Trade standardization or development organizations.

On 10 August 2007 it was announced [1] that APEC starts to develop a customization of the UNeDocs data model for Asian-Pacific Trade: “APEC approved the funding of a UNeDocs data model customized to the specific needs of trade and information exchange of APEC member countries. The project will provide a customized UNeDocs data model for the region, based on open, international standards set by the UN and the WCO. The data model will allow the automated, one time submission of information and documents both in paper and in electronic (XML or UN/EDIFACT) format. It is expected that the automation of information flows will increase the security of trade and the competitiveness of exports.”

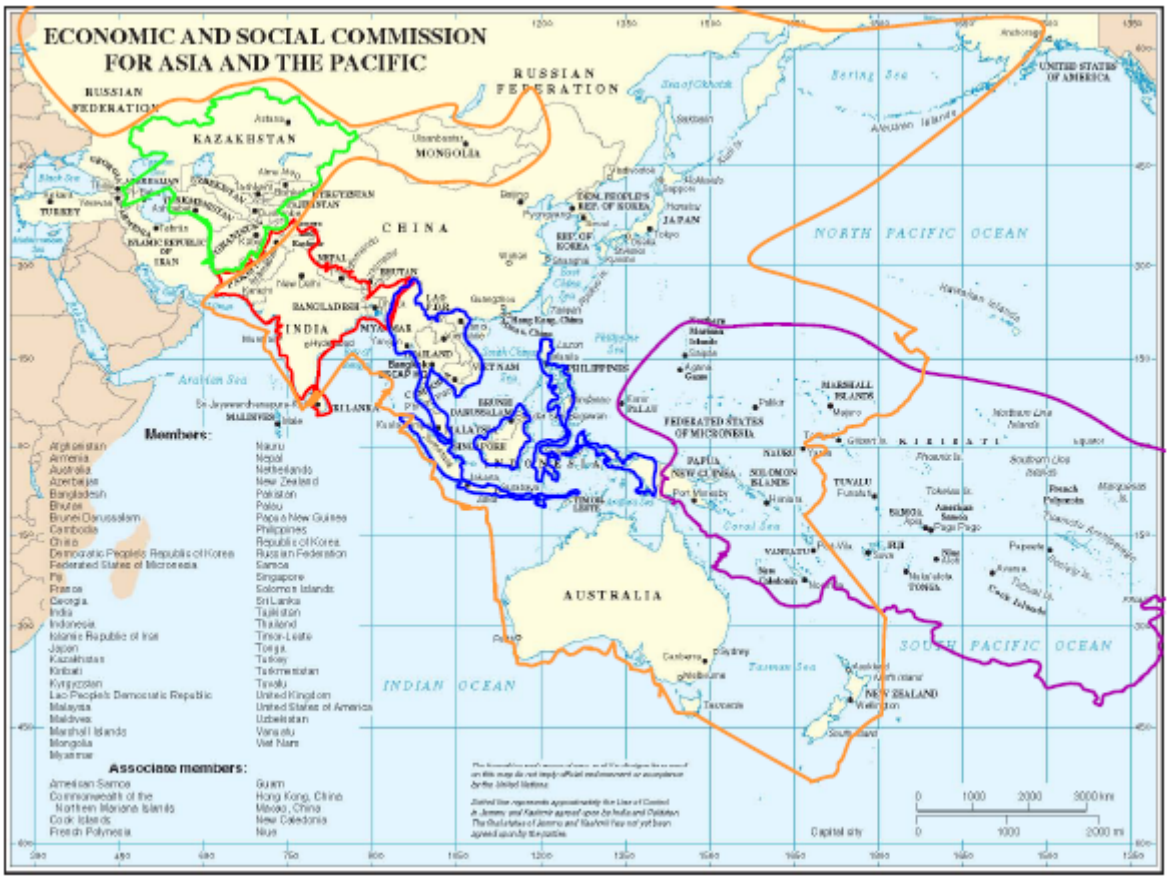


Fig. 4. UN-members under the umbrella of UN Economic and social commission for Asia and the Pacific (UNESCAP).

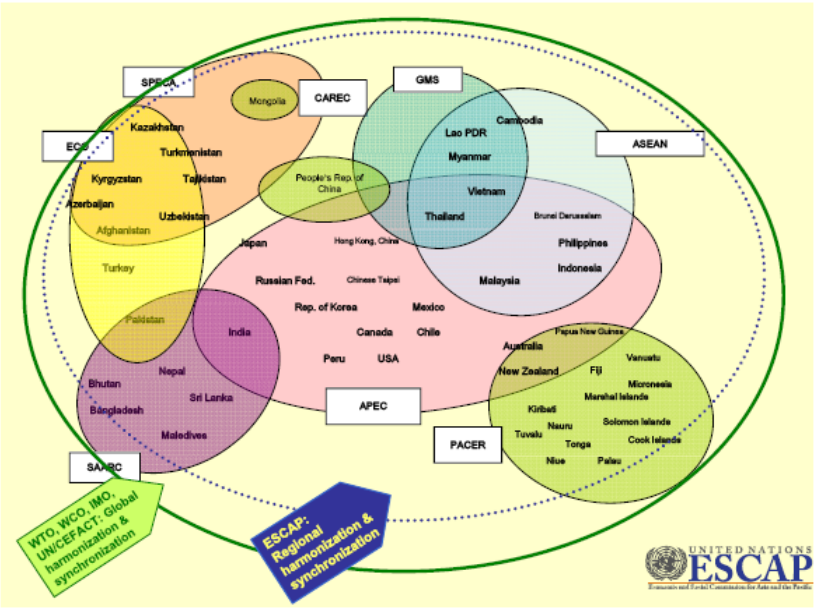


Fig. 5. The set of countries of Asia and the Pacific divided into the subsets of different regional organisations.

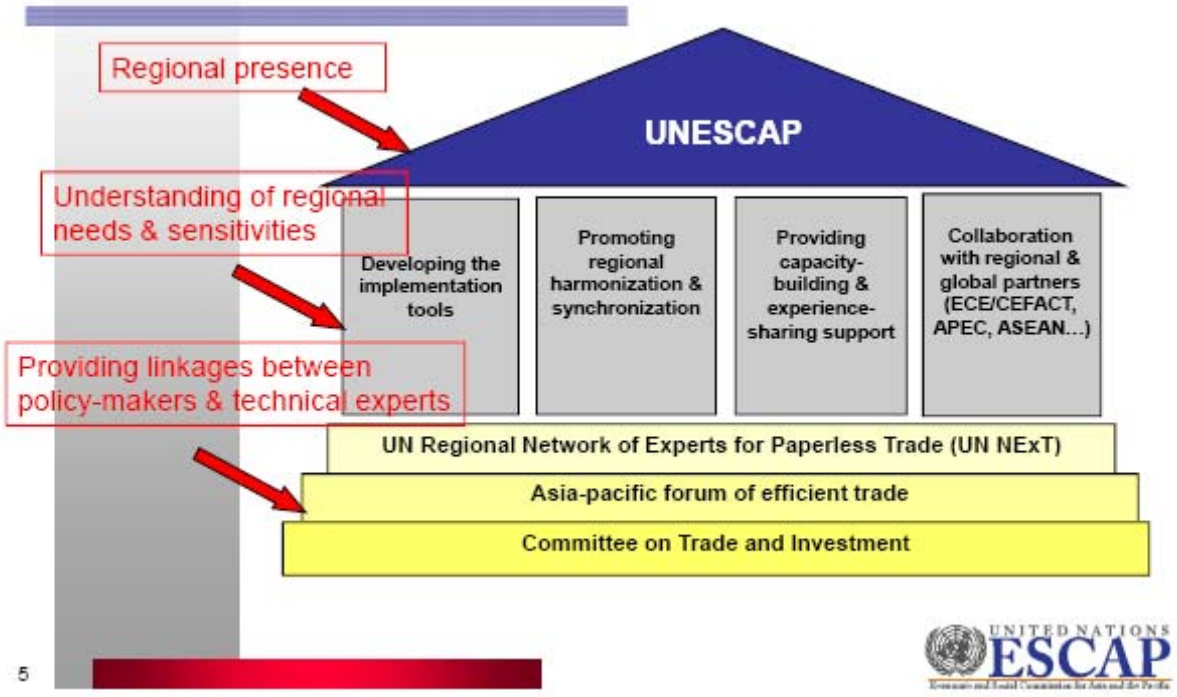


Fig. 6. UNESCAP's support of paperless trading.

In a recent information note by UNECE and UNESCAP [2] this information was again confirmed: “UNeDocs is currently in the final step of approval as an international standard. It is now in an UN/CEFACT implementation and verification phase being carried out in six countries in Europe, North America and Asia-Pacific. After completion of this phase, it will be published as a UN standard. UNECE and UNESCAP have joined their efforts to recommend to Governments that they adopt and implement this standard.

The Asia-Pacific region is one of the richest regions in the setting up of electronic Single Window with almost all sea-linked economies operating such systems. For example, Japan, the Republic of Korea, Singapore, Malaysia and Hong Kong (China) all have such systems already in place. At a subregional level, the ASEAN Single Window is expected to become operational in 2012. It will enable exchange of trade data among all ten nations of ASEAN.

Adoption of Single Window is vital for landlocked countries, as an electronic data submission and exchange can compensate for distance and remoteness.

A close collaboration between UNECE and UNESCAP in promoting the implementation of UNeDocs plays an important role. Such collaboration can be channeled through the regional network of experts for paperless trade, which is planned under the new joined project between the two UN regional commissions. The network of experts will aim to build a critical mass of expertise

for paperless trade in order to implement UNeDocs and other related standards and tools in the Asia-Pacific region. The role of UNECE would be to provide an international expertise on UNeDocs, while UNESCAP would use its convening power and mobilize the regional expertise to promote the region-wide implementation of this future standard so as to ensure interoperability between trade data exchanged among the individual countries and subregions."

But in reality there is no evidence that any funded project structure exists for cooperation of APEC, UNECE and UNESCAP in fostering customization of UNeDocs and Single Window standards and realization of roadmap towards Paperless Trade [3] for Asia-Pacific region.

It is clear that you can accelerate and concentrate the development of sound standards set if in parallel a real system using them is developed. That is why we propose the concept of APEC e-Trade Hub (Fig. 7). To specify this hub's stack of standards we will use Reference Model (AETHRF).

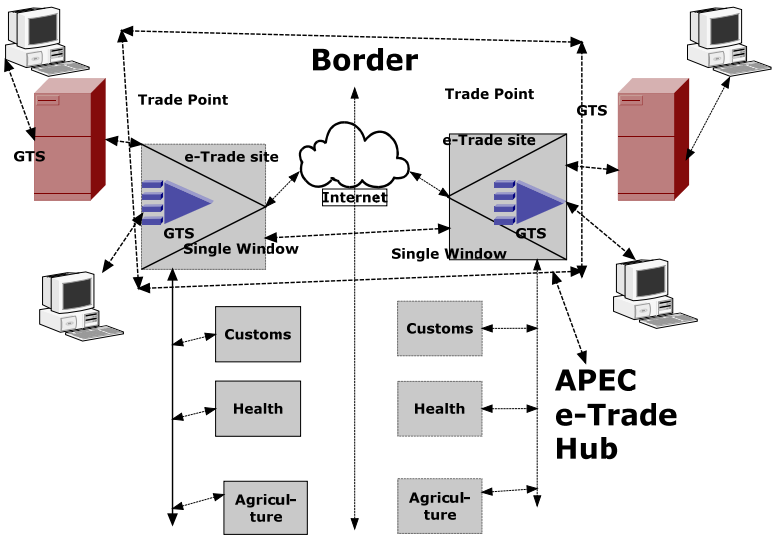


Fig. 7. APEC e-Trade Hub structure: GTS -- Global Trade Services.

APEC E-TRADE HUB Reference Model Introduction

Reference Models have been developed primarily in order to provide standards required for the inter-working of organizations, through interconnected information technology systems [4]. This kind of model is independent of specific:

- information technology implementations;
- business content or conventions;

- business activities;
- parties participating in business activities.

The first issue of ISO/OSI reference model in 1978 had only around 30 pages. Now in 30 years it had been enlarged to hundreds of pages.

The hub is a distributed information systems consisting of Trade Points (TP), connected through Internet. In each APEC economy no less then one TP should be deployed.

A TP executes e-Trade site (may be part of National Electronic Commerce System, NECS), Single Window (SW) and Global Trade Services (GTS) business functions. E-trade site is international e-Commerce site, Single Window provides on-line “Single Window Access Points” where businesses and public administrations can exchange the data required by legislation for the APEC cross-border goods movements, GTS automates global trade processes and enables management of large numbers of business partners, and high volumes of documents while also helping them to comply with changing legal regulations. GTS and e-Trade site facilitates global trade esspecially to SME by providing them with the tools required to respond to governments modernizing their systems and to customs authorities communicating electronically with businesses.

User’s workstations could be connected to TP over a special GTS server [5] or directly into TP with GTS functions over any type of communications channel (terrestrial, cellular or satellite). GTS consists of the following key capabilities:

- Compliance management (sanctioned party list screening, export legal control, iimport legal control).
- Customs management (customs processing, transit procedures, trade document printing, customs communications).
- Risk Management (restitution handling, preference processing).

Current Transborder Trade Capabilities in APEC

In Table 2 and 3 are presented current international and national APEC capabilities for transborder trade. Table 4 mirrors implementation of models and standards [6-11] in different global or regional e-Trade systems. UN Trade Points Network is not focused on compliance with

modern e-Trade standards. PAA.Net and national e-Trade systems strive to confirm to UNeDocs and Single Window standards. It is clear that consolidation, harmonization and integration of standardization efforts are needed to make seamless transborder e-Trade in APEC region as it done in ASEAN subregion.

Table 2. International systems for transborder trade in APEC.

APEC Member Economies	**UN Global Trade Pointes Network (GTPN, nodes in cities)[3]**	**Pan-Asian E-Commerce Alliance Network (PAA.Net, Member Companies)[4]**	**Future APEC e-Trade Hub (Achieved Stages of e-Trade development as of 2005[5])**
Australia	Melbourne, Sydney		4 Medium
Brunei Darussalam			
Canada	Montréal		3 Primary
Chile	Santiago		3 Primary
Chinese Taipei		Trade-Van	4 Medium
Hong Kong, China		TradeLink	5 Advanced
Indonesia	Jakarta		2 Growing
Japan		TEDI	3 Primary
Malaysia	Kuala Lumpur	Dagang Net	2 Growing
Mexico			2 Growing
New Zealand			3 Primary
Papua New Guinea			
People's Republic of China	Shanghai , Beijing	CIECC	2 Growing
Peru	Lima		1 Start
Philippines	Manila, Cebu		1 Start
Republic of Korea		KTNET	4 Medium
Russia	Moscow, St.Petersburg		2 Growing

[3] www.tradepoint.org

[4] http://www.paa.net/paaweb/paa/

[5] http://www.apec.org/apec/publications/all_publications/telecommunications.html

APEC Member Economies	UN Global Trade Pointes Network (GTPN, nodes in cities)[3]	Pan-Asian E-Commerce Alliance Network (PAA.Net, Member Companies)[4]	Future APEC e-Trade Hub (Achieved Stages of e-Trade development as of 2005[5])
Singapore	Singapore	CrimsonLogic	5 Advanced
Thailand	Bangkok	CAT Telecom	2 Growing
United States	Columbus (Ohio), Detroit, Los Angeles		4 Medium
Viet Nam	Hanoi		1 Start

Table 3. National systems for transborder trade in APEC.

APEC Member Economies	National Global Trade Systems	Website
Chinese Taipei	MTNet	https://web02.mtnet.gov.tw/eng/index.jsp
Hong Kong, China	DTTN	http://www.hk-dttn.com/home/english/home.html
People's Republic of China	E-port	http://202.108.152.52/en/index.html
Republic of Korea	uTradeHub	https://www.utrade.or.kr/

Table 4. Implementation of models and standards in different global or regional e-Trade systems (this table is compiled on the base of information of systems' owners as of May 2008). Here: BOV -- Business Operational View, FSV -- Functional Service View.

Type of model/BOV or FSV	Examples	Future APEC e-Trade Hub (goals)	UN Global Trade Pointes Net-work (GTPN)	B2B Energo (Russia)	Pan-Asian E-Com-merce Alliance (PAA.Net)	Republic of Korea, uTradeHub	Chinese Taipei, MTNet	Hong Kong, China (GETS, eBS, & ROCARS)	People's Republic of China, E-port
Data (D)/BOV	UNeDocs Data Model						Not implemented yet	No	
	WCO Data Model v.2 or v.3						Not implemented yet. In the future we will implement WCO Data Model v.3	ROCARS will adopt WCO DM v.3 data elements and XML messages that are simplification of WCO DM v.3 XML messages	
	UNe-Docs/ WCO harmonized Data Model approved by	+					Not implemented yet	No	

	economies								
Business Processes (B)/BOV	UN/CE-FACT International Supply Chain	+					Not implemented yet	No	
	Supply Chain Operations Reference model						UMM	No	
	SingleWindow	+		+			UMM CCL CCTS	The Government receives sea-mode port formalities via eBS, and all-mode trade declarations via GETS. The Government will receive road-mode advance cargo information via ROCARS. The aforesaid information received is shared by different Government departments.	+
Combined: D+B (BOV)	Reference Model for Financial	+						No	

	Settle-ment in E-Busi-ness								
Integrated (BOV)	CEFACT e-business architecture						Not implemented yet	XML messages of Dangerous Goods Manifest handled by eBS are conforming to CEFACT CCTS and transported by ebXML Messaging Services	
	WCO SAFE frame-work of standards						Not implemented yet	ROCARS will be an implementation of SAFE FoS	
	Une-Docs/ WCO harmo-nised e-busi-ness archi-tecture approved by economies	+					Not implemented yet	ROCARS will adopt definitions, formats and Dictionary Entry Names (DENs) of Data Elements included in WCO Data Model Version 3 instead of Data Elements included in UN/TDED 2005	
Open	E-signature	+		+			RSA Triple-DES	Yes	

Systems Interconnection (FSV)	PKI	+		+			RSA Triple-DES	Yes	
	e-Notary	+		+				Yes	
	Messa-ging	+		+				Yes	

APEC e-Trade Hub Reference Model

Components of the e-Trade hub (Fig. 7):

1. E-commerce system
2. Governance, Risk, and Compliance Global Trade Services
3. UN/CEFACT Integrated Framework of Standards for Paperless Trade

E-commerce System

E-commerce system functional model was developed on the previous 1-st stage of the project.

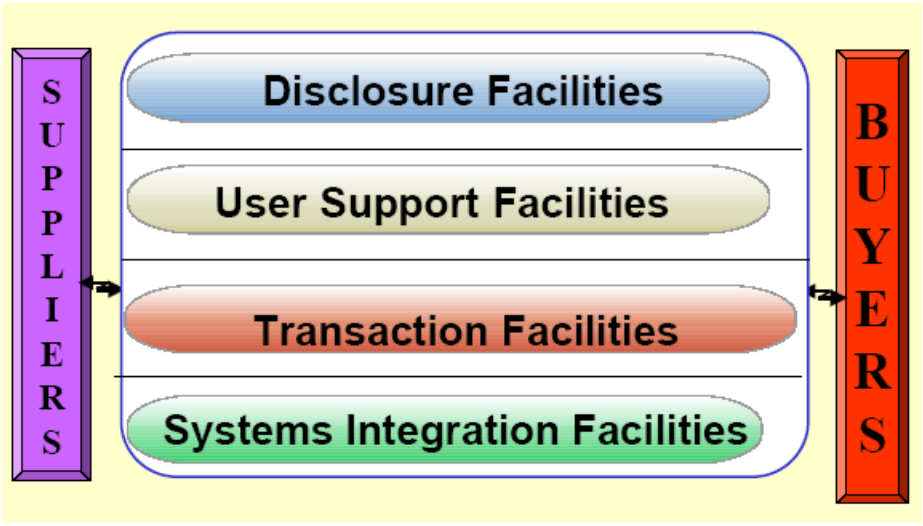


Fig. 8. Functional components of an e-Commerce System's trade site.

A fully developed E-commerce system has three broad components as shown on Fig.8:

1. **Disclosure and User Support facilities**.

It consists of a World Wide Web-based facility dedicated to the full disclosure of all public procurement opportunities and contract awards. As a minimum this facility should allow: a) public query, in various classifications, of outstanding procurement transactions, their purpose and timetable, and the associated bidding documents, b) public consultation of a complete database of public procurement awards and complaints, in multiple classifications, and their associated documentation (except for the actual bids, which are confidential), c) production of statistical reports from the above database.

2. **Transaction Facilities:**

   - **Electronic Tendering Component.** E-Tendering systems support carefully regulated competitive bidding processes based on detailed bidding documents (BD) and technical specifications (TS). E-Tendering systems are particularly suitable for procurement of large public works, of production capabilities such as power plants, of performance capabilities such as large information systems, or of sophisticated services such as design and management of virtual private communication networks. All these are documentation-heavy procurement transactions that require careful evaluation of quality aspects, customized contracts, and extensive services. They encompass diverse packages of goods and services (for delivery, installation, testing, integration or maintenance of goods supplied).
   - **Electronic Purchasing Systems.** E-Purchasing systems are primarily oriented towards discrete item or lot purchasing of off-the-shelf products and/or precisely defined services. Their distinguishing characteristics are: 1) they involve an electronic, legal equivalent of a physical marketplace where goods are figuratively displayed (electronic catalog) and buyers and sellers meet under rules of procedure enforced by the marketplace operator; 2) they provide comparison facilities and electronic pricing mechanisms, but not contract formation facilities as terms and conditions of contracts are pre-established; 3) they involve full, legally binding electronic contracts subject at most to offline confirmation, but not to off-line decision processes. There are two broad modalities of e-purchasing systems distinguished by their price setting mechanism as follows: in the e-shopping modality, selling prices are fixed and known and in the e-auction modality, prices are determined through an electronic bidding process either among several buyers (e-bidding) or among several suppliers (e-reverse bidding).

3. **Systems Integration Facilities.** They interconnect front and back offices of the e-commerce business and the users of the e-commerce business – services and goods suppliers and buyers, also they help build logistic chains.

In annex 3 the framework for National e-commerce system (NECS) is presented. E-commerce system of e-Trade hub should be a part of NECS.

Governance, Risk, and Compliance Global Trade Services

To conduct business globally, buyers and sellers on the opposite ends of supply chain need to comply with local laws, satisfy trade security measures, meet documentation requirements, understand complicated tariffs, and coordinate various parties. Handling these tasks manually increases the risk of failure – which can be costly when trading across borders. In fact, the inefficient administration of customs processes accounts for 7% of the cost of international trade, according to a United Nations study – **U.S. $420 billion annually**.

Application helping to support international expansion of business, can lower the cost and reduce the risk of conducting business globally. By enabling enterprise, be it large or SME, to establish a single, corporate-wide standard for trade processes across enterprise information systems, Governance, Risk, and Compliance Global Trade Services ensures reliable and compliant trade activities. This application provides a comprehensive platform for managing all foreign trade processes. Centralized management ensures trade compliance, expedited cross border transactions, and optimum utilization of trade agreements – replacing high-maintenance manual processes and providing one global view of trade across your enterprise.

Let us consider functions of Governance, Risk, and Compliance (GRC) Global Trade Services (GTS) on the example of appropriate SAP application[6] that helps enterprises:

- **Meet regulatory requirements and manage the complexities of global trade** – Use standardized, enterprise-wide trade compliance processes in supply chain, human resource, and financial processes for proactive trade management.
- **Expedite the importing and exporting of goods through customs** – Leverage improved transparency throughout the supply chain to share cross-border trade information with partners, such as freight forwarders, brokers, insurance agencies, banks, and regulatory entities.
- **Mitigate financial risk and maximize profit with best utilization of international trade agreements** – Avoid supply chain bottlenecks, production downtime, and errors that can result in costly penalties with comprehensive letter of credit

[6] http://www.sap.com/solutions/grc/globaltradeservices/index.epx

management, preferential product treatment using trade agreements, and comprehensive analytics based on daily business data.

One can implement SAP GRC GTS quickly for a rapid ROI, and easily adapt the application to meet changing business and regulatory requirements.

The SAP GRC Global Trade Services application is powered by the SAP NetWeaver technology platform[7], a comprehensive integration and application platform in SOA style. The application supports four major business processes (Table 5)[8]:

- **Export management** – Automates and streamlines complex export processes to ensure faster delivery to customers by minimizing delays at national borders while ensuring compliance with relevant regulations and mitigating the financial risk of global transactions.
- **Import management** – Helps to expedite customs clearance for import shipments to reduce costly buffer stock and implement just-in-time inventory management. SAP GRC Global Trade Services allows easily classifying products, calculating duties, streamlining electronic communication with customs authorities, ensuring import compliance, and efficiently managing letters of credit.
- **Trade preference management** – Helps to make the most of international trade agreements with capabilities to solicit vendor declarations, determine the eligibility of products for preferential treatment, and issue certificates of origin to customers.
- **Restitution management** – Enables to manage and calculate the restitution for the export of common agricultural products (CAP) out of the European Union with capabilities to assign securities, manage export licenses, maintain recipes, and calculate and apply for refunds.

So , SAP Global Trade Services is a solution for management of regulatory compliance for imports and exports - including embargo checking, license management and sanctioned party list screening. With SAP GTS companies can lower the cost, and reduce the risk, of doing business internationally. This solution helps companies standardize and streamline trade processes across

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[7] http://www.sap.com/platform/netweaver/index.epx

[8] http://www.sap.com/solutions/businessmaps/0A3B961AC2E64CADA46181F484B183D5/index.epx

their entire enterprise and business units. And it fosters use of shared data and shared collaboration knowledge, replacing high-maintenance manual processes.

Table 5 Four major business processes of SAP GRC Global Trade Services.

Export management	*Export classification*	*Export compliance*	*Outbound customs services*	*Outbound trade finance services*	*Electronic compliance reporting*	SAP NetWeaver
Import management	*Import classification*	*Import compliance*	*Inbound customs services*	*Inbound trade finance services*	*Electronic compliance reporting*	
Trade preference management	*Vendor declaration handling*		*Preference determination*		*Customer declaration handling*	
Restitution management	*Securities and licenses handling*	*Restitution recipes handling*		*Restitution calculation*		

UN/CEFACT Integrated Framework of Standards for Paperless Trade

A recent major international Symposium[9] (www.apecun-korea.org), organized by the Asia-Pacific Economic Cooperation (APEC) and the United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT, http://www.unece.org/cefact/) has concluded that using open, harmonized, international standards is critical for successful cross-border paperless trading. The objective of the Symposium, held in Seoul, was to identify instruments that would enable "phased development" of paperless-trading among APEC's member economies. A number are already quite advanced in implementation, whereas others are less ready to adopt paperless trading.

[9] INTERNATIONAL STANDARDS TO PROGRESS PAPERLESS TRADING IN ASIA-PACIFIC (Joint APEC-UN/CEFACT Capacity-building Symposium on Paperless Trading, Seoul, 26-28 May 2008) -- Press Release ECE/TRADE/08/P04, Geneva, 3 June 2008.

Symposium recommendations are as follows:

- Capacity building will be critical. A mentoring programme among APEC's member economies was proposed and participating organizations were called upon to collaborate on a joint capacity-building program. It was also suggested that a regular communications channel be established among these organizations.
- Joint APEC-UN/CEFACT task force to be set up to develop both a common mission statement and projects for promoting the United Nations' international standards and recommendations.
- A priority requirement would be to engage high-level support from political and economic leaders. For this, an APEC convention such as a Ministerial meeting on e-commerce was suggested. A proposal was also made to prepare a recommendation on the use of the UN/CEFACT Core Component Library as the foundational data standard for cross-border paperless trading. This recommendation could then be submitted for consideration to all relevant intergovernmental organizations.
- Special action was called for to encourage the private sector, including industry associations, to get involved in developing paperless trading and related standards. Emphasis was placed on the need to show a convincing business case that demonstrates the benefits of paperless trading to all supply-chain participants, including government agencies and small and medium-sized enterprises.
- UN/CEFACT is requested for developing recommendations related to the Single Window and includes a paperless-trading capacity-building project in the UN/CEFACT Electronic Business, Government and Trade (eBGT) project that is being launched.

Prior to the Symposium, a survey was conducted on paperless trading in 13 APEC economies. The consultant for the survey, Ms. Mary Kay Blantz, said, "While it wasn't surprising to discover that all 13 responding economies were active in paperless-trading, I didn't expect to find such widespread support for international standards, as well as such willingness to participate in developing and implementing them."

Other participating regional and international organizations that indicated their desire be part of the follow-up to the Symposium included the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), the United Nations Economic Commission for Latin America and the Caribbean (UNECLAC), and the World Customs Organization.

Mr. Mike Doran, Chairman of the UN/CEFACT Forum, Mr. Yung-Suh Park, Program Director of the APEC Secretariat and Mr. Lim Sangwon of the Korean Institute for Electronic Commerce, and Project Coordinator of the Symposium, unanimously agreed that the Symposium's conclusions and recommendations would make a significant difference by putting in motion processes that would improve the promotion and implementation of paperless trading, both in the APEC region and globally.

UN/CEFACT structure and activity

The United Nations/Centre for Trade Facilitation and Electronic Business (UN/CEFACT, Fig. 9-12)[10] is a chartered activity of the UN Economic Commission for Europe (UN/ECE). The UN/CEFACT mission is to support, enhance, and promote trade facilitation between developed, developing and transitional economies.

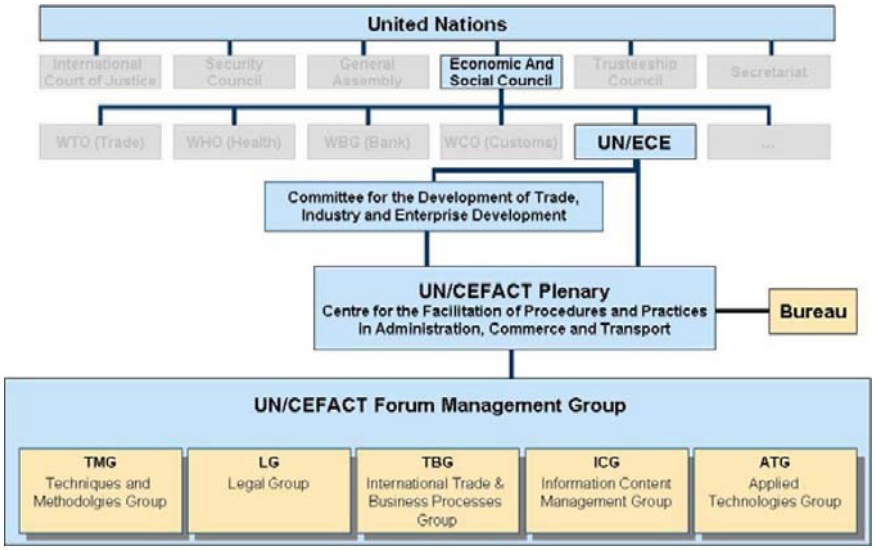

Fig. 9. UN/CEFACT structure and activity.

[10] Mark Crawford. Getting Started with UN/CEFACT. – SAP Developer Network, SAP AG, 2006.

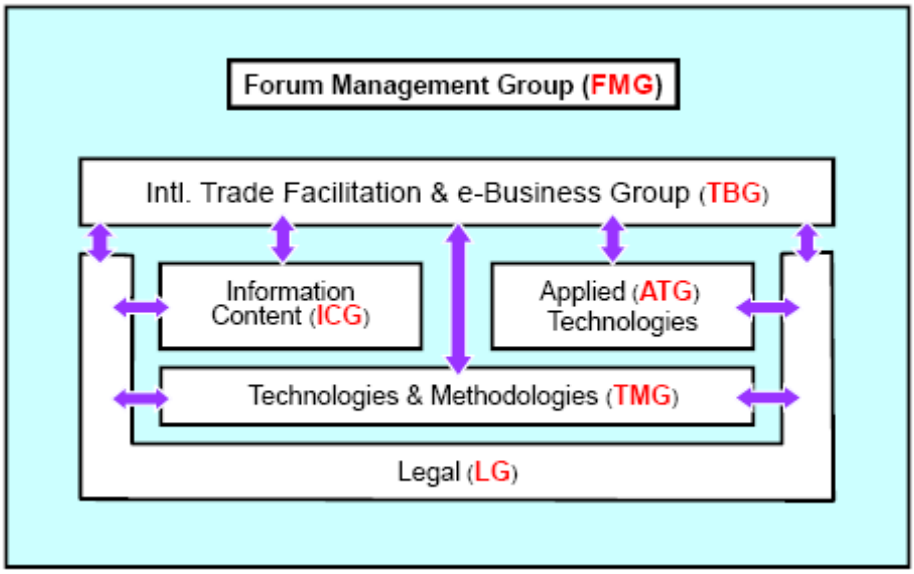

Fig. 10. Interaction of Forum Groups activities.

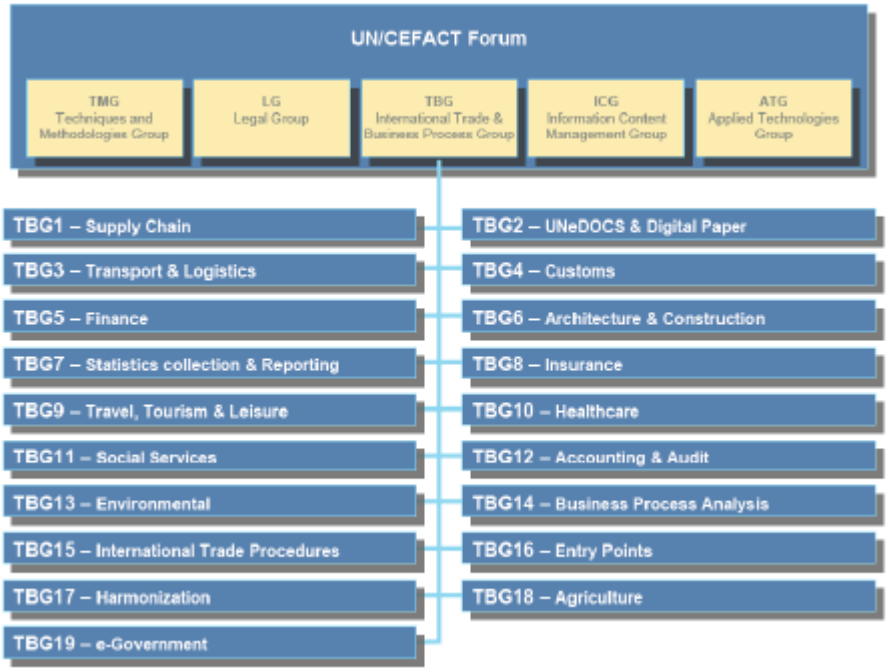

Fig. 11. International Trade and Business Processes Group.

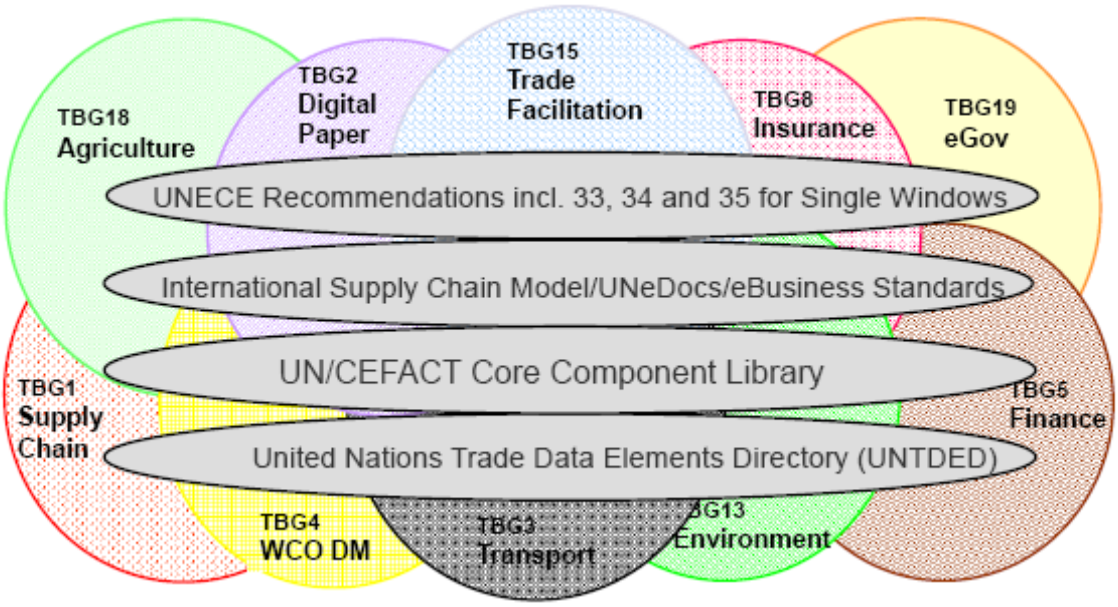

Fig. 12. UN/CEFACT trade facilitation (buy-ship-pay) standards framework.

To achieve this mission, UN/CEFACT focuses on simplifying and harmonizing processes, procedures, and information exchanges through development of a comprehensive set of technical specifications and standard business processes. UN/CEFACT standards consist of:

- EDI Messages and supporting data elements,
- Technical specifications for the UN/CEFACT EDI syntax (EDIFACT),
- Technical specifications for methodologies and
- Syntax specific implementation specifications such as XML Naming and Design Rules.

Organization. The UN/CEFACT organization consists of the plenary with representatives from countries around the globe. The plenary oversees the work efforts of a wide variety of permanent groups.

The Plenary is supported by the Bureau, which functions as an advisory board and oversees the work effort of the permanent groups through the Forum Management Group (FMG). Membership in the plenary is through designation by member nations.

Membership in the various work groups is through designation by the member nation. These representatives work primarily in the UN/CEFACT permanent groups[11], developing standards:

1. Applied Technologies Group (ATG)
2. Forum Management Group (FMG)
3. Information Content Management Group (ICG)
4. International Trade and Business Processes Group (TBG, http://www.uncefactforum.org/TBG/TBG%20Home/tbg_home.htm)
5. Legal Group (LG)
6. Techniques and Methodologies Group (TMG)

In Table 6 UN/CEFACT standards are listed and theirs maturity levels shown as of 2006.

[11] http://www.uncefactforum.org/

Table 6. UN/CEFACT standards set and maturity as of 2006 (Source: Barbara Flügge, Till Jannerand, Christoph Schroth, SAP AG/RESEARCH Lab, St Gallen. "Technology Push vs. Market Pull. Software Engineering Companies: Corporate Research Units as Pull Facilitators" – In: EuroMOT2006 Second European Conference on Management of Technology 10th to 12th September 2006 Birmingham, United Kingdom)**.**

Name	Explanation	Current version	Maturity*	Comments
Business Operational View				
Core Component Library , CC Library	Core Component Library. First set of generic and CCTS based business information; contains the aggregated core components	V 05A	¾	**Core Component Library (V06A)-**first set of generic and CCTS based business information available
Core Components Technical Specification, CCTS	ISO 15000-5 CCTS developed by UN/CEFACT and ISO Technical Committee (TC) 154 provides a methodology for semantic data modeling that archives a common understanding of data structures and message types on a syntax independent level.	V 2.01	7/8	The **Core Component Technical Specification Version 2.2** defines meta models and rules necessary for describing the structure and contents of conceptual and physical/logical data models, process models, and information exchange models
Context Driven Methodology, CDM	Methodology for assigning context to business information using a number of context drivers	V 1.0	1/8	Project proposal existing
Business Message Assembly, BMA	Methodology for assembling higher level business information for electronic messages	V 1.0	1/8	Project proposal existing

Standard Business Document Header, SBDH	Determines application based logical routing requirements of business information	V 1.3	7/8	SBDH: **V1.3** readily available–Technical Specification by UN/CEFACT TMG CCWG
Core Data Type, CDT	Smallest and generic piece of information in a business data model with relevant characteristics	V 2.2	¾	**V2.2 –Annex B of CCTS –Draft version**, Core Data Types still subject to refinement and extension
UN/CEFACT Modeling Methodology, UMM	UN/CEFACT Modeling Methodology: unified approach to capture business logic and model business processes as well as OCTS compliant data	V 1.0	¾	UN/CEFACT's Modeling Methodology (UMM): Version 1.0 for implementation verification completed
Functional Service View				
Business Collaboration Schema Specification , BCSS	Business Collaboration Schema Specification: UML based representation of CCTS based conventions and artifacts	V 1.0	½	BCSS: UML Profile for Core Components based on CCTS 2.01: Version 1.0 existing
UN/CEFACT XML Naming and Design Rules, NDR	Rules for XML Schema and XML based instance representation of CCTS based conventions and artifacts	V 2.0	¾	UN/CEFACT XML NDR for CCTS (XML Naming and Design Rules): According to G. Stuhec, theses NDR are **more mature than its competitors** UBL NDR and DON NDR

Schema for Core Data Type (CDT)	Smallest and generic piece of business information represented in XML schema	V 2.0	¾	**V2.0**–Technical Specification by UN/CEFACT
Registry Specification	Specification defining scope and functionality of registries and repositories	V 1.0	½	A **Second Working Draft of the UN/CEFACT Registry Implementation Requirements** Specification 1.0 is existing: The draft document contains information as guidance for establishing the UN/CEFACT Registry based on the OASIS ebXML registry specifications

*Maturity Legend: 7/8 – Completed only minor changes expected; ¾ -- Ready for implementation; ½ -- First comprehensive draft available; 1/8 – Specifications efforts started recently.

Permanent Groups and Their Standards. The permanent groups have a division of work that ensures a consistent and harmonized approach to developing trade facilitation standards.

- The TMG is responsible for developing new technical specifications in support of the work efforts of the other groups[12].

  - Core Components Technical Specification – New paradigm in semantic data modeling for desiging, storing, sharing, and using data within and across the firewall. CCTS is a strategic aspect of NetWeaver and Enterprise Services. SAP chairs this effort and functions as editor.

  - Message Assembly (In Draft) – defines anapproach for building syntax neutral business messages from independent constructs in a coordinated fashion with other UN/CEFACT standards. Message Assembly will play a future role in ESA. SAP participates in this effort.

  - UN/CEFACT Modeling Language (UMM) – defines a specific profile of the Unified Modeling Language for creating consistent Business Process Models. SAP is beginning to implement UMM. SAP participates in this effort.

  - XMI Profile (In Draft) – defines XMI 2.0 profile for expressing UN/CEFACT models and Core Components as interchange between applications. The XMI profile will be of significant value in the future for transporting process models. SAP participates in this effort.

- The TBG is responsible for developing business process models and core components that define information exchanges between trading partners.

  - Process Specific BRS and RSMs – The requirements statements, process models, and candidate Core Components (conceptual data model) and Business Information Entities (physical/logical) data model

  - Core Components Library – the master set of harmonized and approved Core Components and Business Information Entities. The core component library will be the lynchpin for future business vocabulary interoperability. SAP customers will be incorporating this library

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[12] SAP chairs the TMG and is actively involved in the development of their specifications.

through the levels of adoption set by their vertical industry groups. SAP chairs the development of this library.

- The ICG functions as the UN/CEFACT librarians through creation and maintenance of an electronic registry consisting of technical specifications, business process models, core components, and syntax specific expressions.

  - UN/CEFACT Registry Specifications – a UN/CEFACT profile for an ebXML Registry. SAP participates in this effort.

- The ATG is responsible for developing and maintaining XML, EDI, and other syntax expressions of TBG models. SAP is the Vice Chair of this work group, and Chair of the XML Syntax Work Group.

  - XML Naming and Design Rules – Cohesive set of rules that optimize the expression of UN/CEFACT Core Components in XML. The NDR can also be used for other OO based constructs. SAP is using the CEFACT XML NDR as part of its CCTS conformance approach, and will use this specification to create future SAP owned CCTS constructs and XML messages. SAP chairs the development of this specification and functions as editor.

  - Standard Business Document Header – Defines an approach to including required business information at the header level (either A2A or B2B) in XML messages. SAP is involved in the next version of this specification.

  - UML2 EDIFACT – Defines a consistent approach for converting UN/CEFACT developed UML models into EDIFACT Syntax messages.

UN/CEFACT Advantages:

- UN/CEFACT is an internationally recognized and independent standards development organization chartered by the United Nations to establish global e-Business standards

- More than 40 years of experience in facilitating global trade

- UN/CEFACT is building on the lessons learned from UN/EDIFACT – the largest number of implementations for B2B integration today

- Vision for global e-Business through common understandable business semantics and logic

- Provides a generic foundation for all industries and countries

- More than 50 countries and more than 1500 experts from key players in business, trade, and governments create a one-of-a-kind community for standards development

The UN/CEFACT Electronic Business Architecture

The UN/CEFACT Electronic Business Architecture (UEB)[13] or e-Business stack of standards describes a high level architecture for an infrastructure to facilitate electronic business on a global scale in a secure, reliable and consistent manner. The architecture provides a logical view of the abstract architectural components in order to facilitate both Extensible Markup Language (XML) and other structured information exchanges such as Electronic Data Interchange (EDI) formats like UN/EDIFACT (United Nations Electronic Data Interchange for Administration and Transport). The e-Business Architecture is considered a superset of the Electronic Business XML (ebXML) Technical Architecture , and serves to complement and extend that document.

On Fig.13 and 14 the evolution of e-Business stacks from EDI to UN/CEFACT Electronic Business Architecture is shown and on Fig. 15 they are compared.

In order to be independent of any specific implementation platform the UN/CEFACT Electronic Business Architecture breaks down all aspects of Business Collaborations into two sub-groups, the Business Operational View (BOV) and the Functional Service View (FSV), according to the principles of the Open-edi Reference Model, ISO/IEC 14662.

Furthermore the UN/CEFACT Electronic Business Architecture acknowledge that real-world business components must have counterparts in the electronic business infrastructure in order for the architecture to be capable of facilitating all aspects of business electronically. Thus the architecture prescribes the use of modeling techniques, e.g. the UN/CEFACT Modeling Methodology (UMM), as the basis for the business collaboration areas of the architecture.

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[13] http://www.ebxml.eu.org/uncefact-ebusiness.htm , www.christoph-schroth.de/personal/UNCEFACT_SOA_SCHROTH_JANNER_STUHEC.pdf , Electronic Business Architecture Technical Specificati***on,*** Revision 0.83. -- UN/CEFACT/TMG.

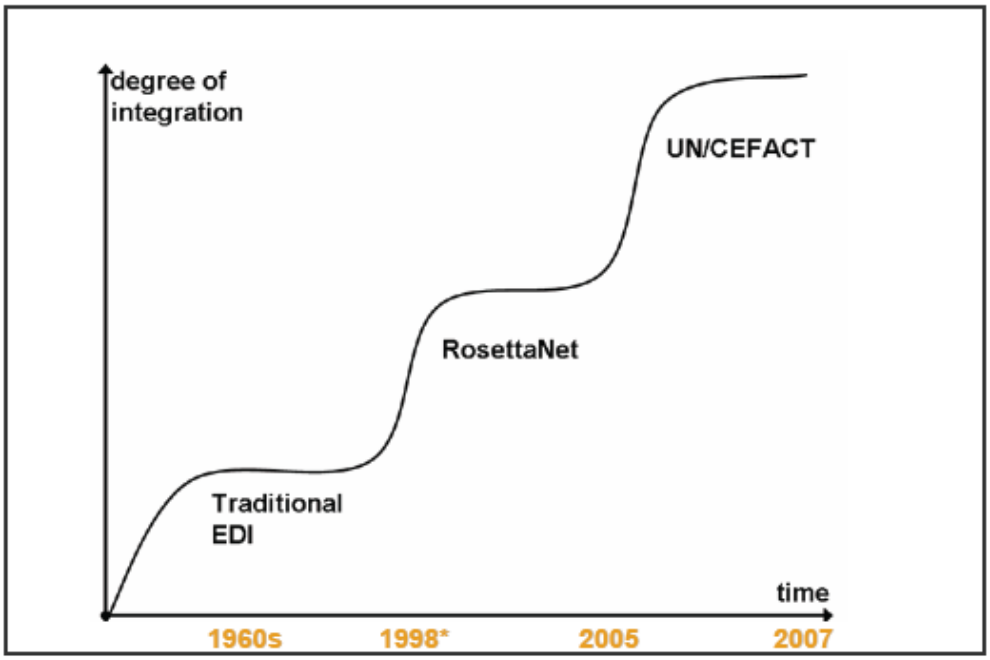

Fig. 13. Evolution of e-Business stacks. (Source: Barbara Flügge, Till Jannerand, Christoph Schroth, SAP AG/RESEARCH Lab, St Gallen. "Technology Push vs. Market Pull. Software Engineering Companies: Corporate Research Units as Pull Facilitators" – In: EuroMOT2006 Second European Conference on Management of Technology 10th to 12th September 2006 Birmingham, United Kingdom)

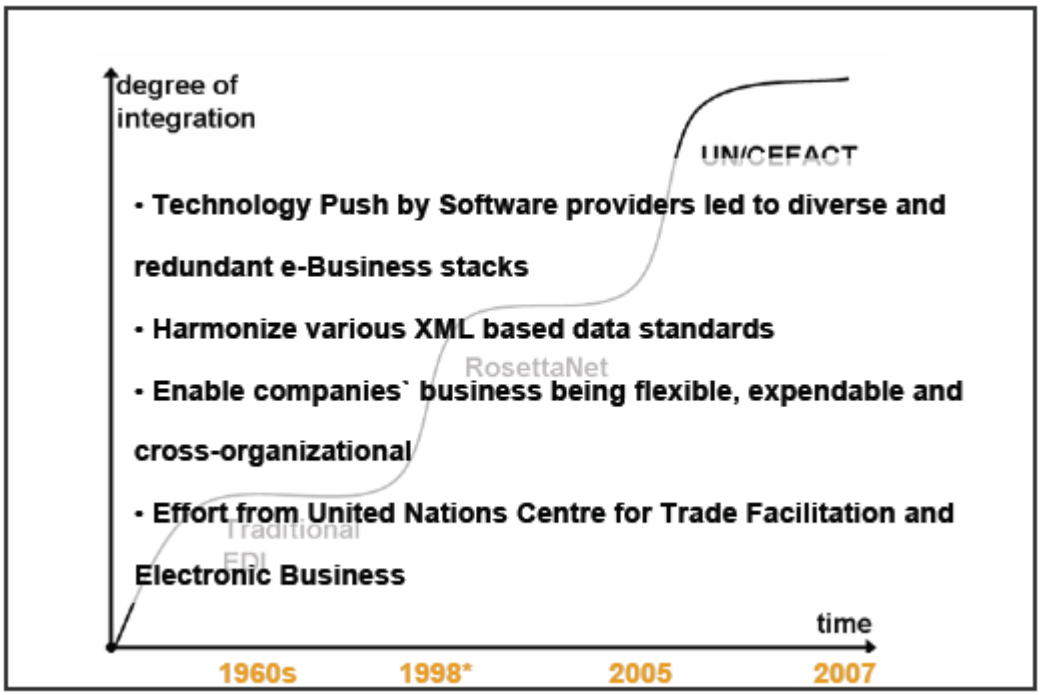

Fig. 14. Evolution of e-Business stacks as degree of integration. (Source: Barbara Flügge, Till Jannerand, Christoph Schroth, SAP AG/RESEARCH Lab, St Gallen. "Technology Push vs. Market Pull. Software Engineering Companies: Corporate Research Units as Pull Facilitators" – In: EuroMOT2006 Second European Conference on Management of Technology 10th to 12th September 2006 Birmingham, United Kingdom)

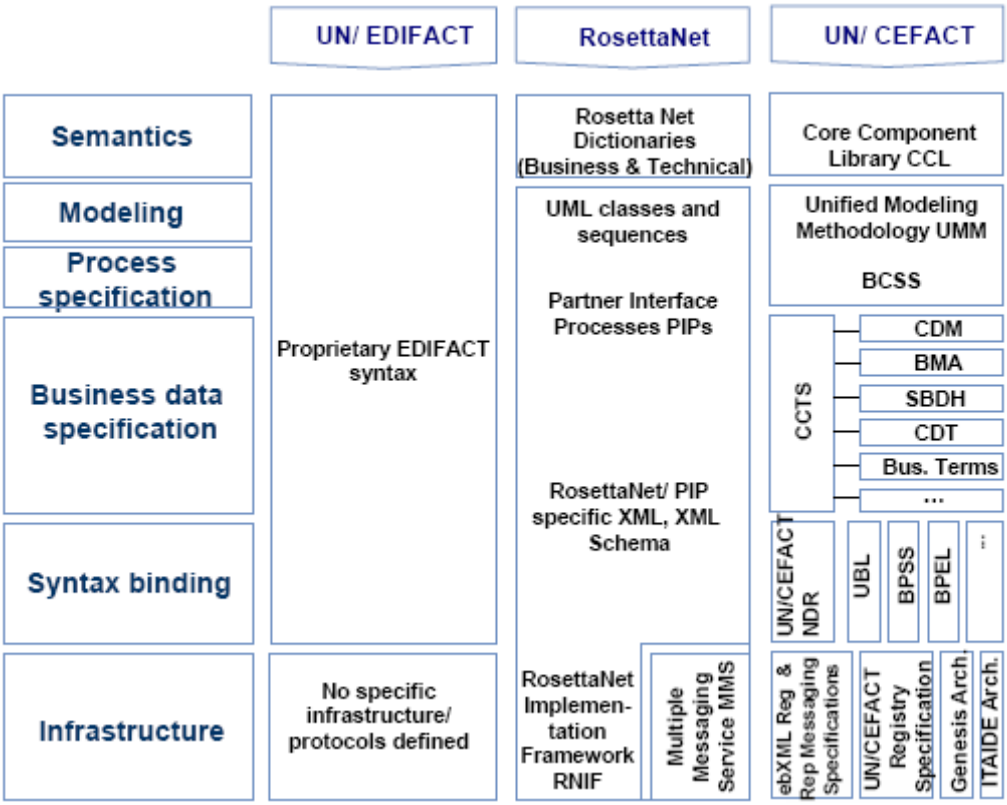

Fig. 15. UN/CEFACT e-Business stack compared to EDI and Rosetta e-Business stacks. (Source: Barbara Flügge, Till Jannerand, Christoph Schroth, SAP AG/RESEARCH Lab, St Gallen. "Technology Push vs. Market Pull. Software Engineering Companies: Corporate Research Units as Pull Facilitators" – In: EuroMOT2006 Second European Conference on Management of Technology 10th to 12th September 2006 Birmingham, United Kingdom)

The objective of the UN/CEFACT Electronic Business Architecture is to provide a flexible electronic business architecture that maintains a technology-neutral perspective where possible. Some of the key feature and capabilities of the UN/CEFACT Electronic Business Architecture are:

1. Platform independence
2. Event driven Architecture
3. Facilitation of multiple concurrent and/or different implementations
4. Component based architecture allowing e-Business components to be added, deleted or modified
5. Allows proprietary protocol support, including custom extensions for industry standards. This refers to, but is not constrained by, electronic message payloads
6. Custom workflow, information and syntax definitions are allowed in support of unique business rules and requirements, as may be defined by users
7. Incremental phased implementation

8. Business to business interoperability

UN/CEFACT e-Business Stack of standards (Fig. 15), described in [12], could be considered as first (zero) version of APEC e-Trade Hub Reference model. This Stack of standards features:

- Focus on the Business Operational View: business processes and data shall be modeled in a syntax- and technology-independent manner
- UN/CEFACT desires to close the semantic gap in B2B which has emerged from a non-controlled definition of business libraries and the contempt of rules for describing semantics in a common way
- UN/CEFACT stack consists of several, modular specifications (some still in development)

UN/CEFACT trade facilitation recommendations

The United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT) continues its mission to improve the ability to exchange products and services among countries. It has developed and maintained a series of more than 30 recommendations and standards[14], which are used worldwide to simplify and harmonize trade procedures and information flows. Many of these are now international standards of the International Organization for Standardization (ISO).

Recommendation 1, for instance, the United Nations Layout Key for Trade Documents, is now the international standard for international trade documents. It is the basis for many key trade documents such as the European Union's Single Administrative Document (SAD). Other examples of its application include:

• Freight Forwarding Instruction - FIATA (International Federation of Freight Forwarders' Associations)
• Dangerous Goods Declaration - UNECE (United Nations Economic Commission for Europe)
• Goods Declaration for Export (revised Kyoto Convention) - WCO (World Customs Organization)

[14] Summary of UN/CEFACT Trade Facilitation Recommendations. -- UNITED NATIONS ECONOMIC COMMISSION FOR EUROPE , United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT) , UNITED NATIONS , New York and Geneva 2006, ECE/TRADE/346

Another example, Recommendation 25, the UN/EDIFACT[15] Standard, is the international standard for Electronic Data Interchange. It is used throughout the commercial and administrative world. Complementing this Standard are a variety of recommendations on codes for use in international trade, such as:

- Code for Trade and Transport Locations (Recommendation 16)
- Codes for Modes of Transport (Recommendation 19)
- Code for Representation of Names of Countries (Recommendation 3).

The recommendations also cover more general aspects of trade facilitation implementation, such as:

- Recommendation 4 on National Trade Facilitation Organs outlines an approach to setting up a consultative mechanism between trade and government for implementing trade facilitation measures and instruments
- Recommendation 18 on Facilitation Measures related to International Trade Procedures proposes a series of measures that could by taken by Governments and business for the facilitation of trade transactions.

The latest recommendation, Recommendation 33, offers Guidelines on establishing a "Single Window" facility. **Setting up Single Windows is one of the new approaches to trade facilitation** that can provide extensive benefits to both Governments and trade.

UN/CEFACT Recommendation 33 on Single Window recommends to Governments and trade to establish a single window whereby trade-related information and/or documents need to be submitted only once at a single entry point. The Recommendation also recommends that the single window be established in a public/private sector partnership and that participating agencies coordinate their respective controls through the single window.

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[15] United Nations /Electronic Data Interchange for Administration, Commerce and Transport.

A Single Window (Fig. 16-18) is a facility that allows parties involved in trade and transport to lodge standardized information and documents with a single entry point to fulfill all import, export, and transit-related regulatory requirements. If information is electronic, individual data elements should only be submitted once. In addition, participating authorities and agencies should co-ordinate their controls through the Single Window. It may provide facilities for payment of relevant duties, taxes and fees. In practical terms, it aims to expedite and simplify information flows between trade and government and to bring meaningful gains to all parties involved in cross-border trade. The Single Window is generally managed by a lead agency, usually Customs, enabling the appropriate governmental authorities to access relevant information.

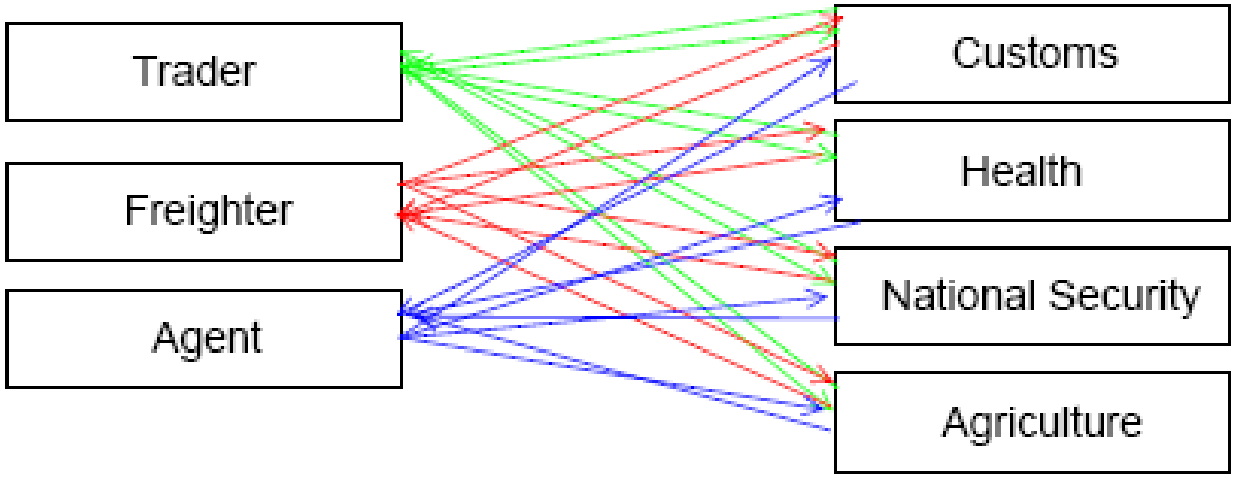

Fig. 16. International trade participants interaction with different law enforcment athorities on the border.

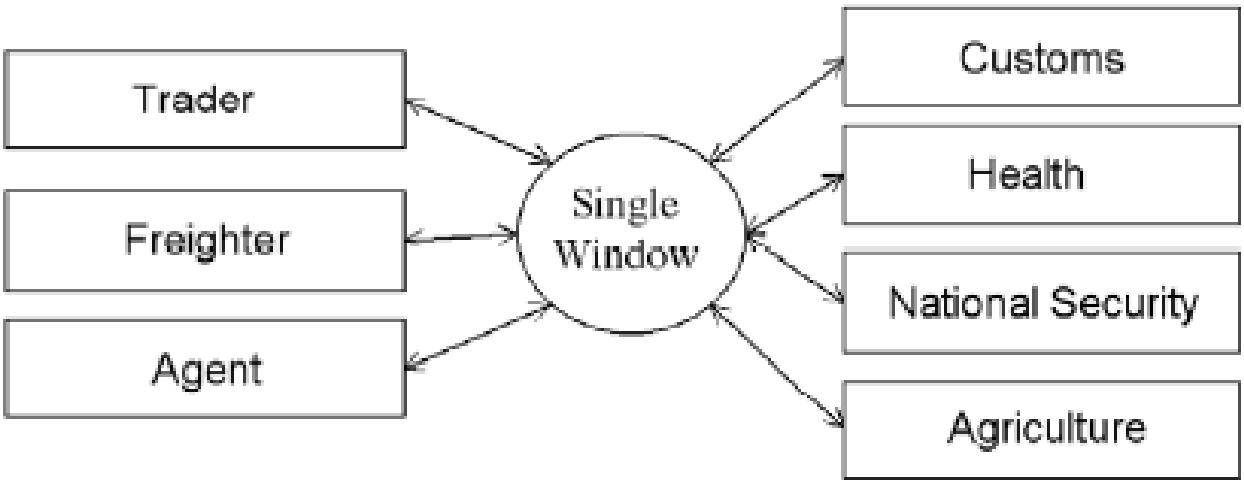

Fig. 17. National single window.

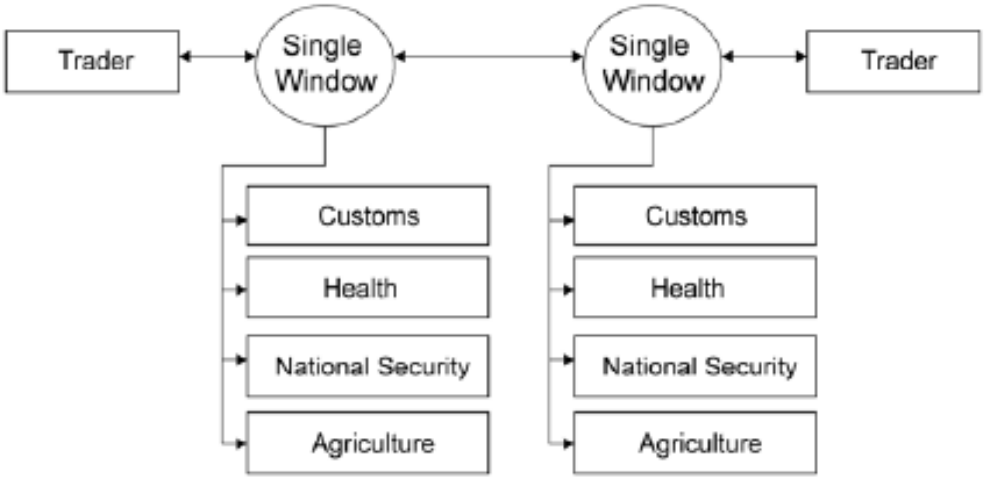

Fig. 18. Interaction of national single windows.

Tools available from different international organizations to assist in implementing a single window are presented in annex 3.

Here is the list of existing recommendations on different stages of development:

Nº 1 United Nations Layout Key for Trade Documents. Documents. Informative

Nº 2 Location of Codes in Trade Documents

Nº 3 ISO Country Code: Code for Representation of Names of Countries

Nº 4 National Trade Facilitation Organs: Arrangements at the National Level to Coordinate Work on Facilitation of Trade Procedures. Guidelines to Nº 4: National Trade Facilitation Bodies

Nº 5 Abbreviations of INCOTERMS: Alphabetic Code 2000

Nº 6 Aligned Invoice Layout Key for International Trade

Nº 7 Numerical Representation of Dates, Time and Periods of Time

Nº 8 Unique Identification Code Methodology-UNIC

Nº 9 Alphabetic Code for the Representation of Currencies

Nº 10 Codes for the Identification of Ships

Nº 11 Documentary Aspects of the International Transport of Dangerous Goods

Nº 12 Measures to Facilitate Maritime Transport Documents Procedures

Nº 13 Facilitation of Identified Legal Problems in Import Clearance Procedures

Nº 14 Authentication of Trade Documents by Means Other Than Signature

Nº 15 Simpler Shipping Marks

Nº 16 UN/LOCODE: Code for Trade and Transport Locations

Nº 17 PAYTERMS: Abbreviations for Terms of Payment

Nº 18 Facilitation Measures Related to International Trade Procedures

Nº 19 Codes for Modes of Transport

Nº 20 Codes for Units of Measure Used in International Trade

Nº 20 Annexes I – III: Units of Measure: Annexes with Code Lists

Nº 21 Codes for Types of Cargo, Packages and Packaging Materials

Nº 22 Layout Key for Standard Consignment Instructions

Nº 23 Freight Cost Code-FCC: Harmonization of the Description of Freight Costs and Other Charges

Nº 24 Trade and Transport Status Codes

Nº 25 Use of the United Nations Electronic Data Interchange for Administration, Commerce and Transport (UN/EDIFACT)

Nº 26 Commercial Use of Interchange Agreements for Electronic Data Interchange (EDI)

Nº 27 Pre-shipment Inspection

Nº 28 Codes for Types of Means of Transport

Nº 29 Codes for Types of Cargo

Nº 30 Harmonized Commodity Description and Coding System for the Docing of Goods and Commodities

Nº 31 Electronic Commerce Agreement

Nº 32 E-Commerce Self-Regulatory Instruments (Codes of Conduct)

Nº 33 Recommendation and Guidelines Establishing a Single Window

UN/CEFACT electronic trade documents

United Nations electronic Trade Documents (UNeDocs) is a project[16] of the United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT). This project aims to:

a) strengthen UN/CEFACT's traditional trade facilitation agenda by applying a holistic approach to trade documents, based on the coordination of Trade Facilitation and e-Business layers and

b) enable the development of simple low-cost solutions to support the generation and exchange of standardized paper and/or electronic international trade documents by implementing existing standards and recommendations.

Two key aspects of this project are to develop an international trade data model based on CCTS/ISO 15000 Part 5 and revision 2004 of UNTDED/ISO 7372, from which document data models can be derived, **providing the ability to move between paper and digital documents at any point in the international trade transaction** and maximizing semantic interoperability. These objectives can only be achieved by close co-operation between trade document users and system designers and implementers.

UNeDocs takes a holistic approach which develops a canonical data model which brings together the data exchange requirements of international trade, transport, finance, insurance, Customs and other regulatory documents based on the integration of trade facilitation and e-Business best practices.

UNeDocs specifies paper and electronic document structures which are derived from the UNeDocs canonical data model. Derivation from this canonical data model ensures that each UNeDocs paper or electronic document specification is an individual implementation of a common document concept which follows the concepts described in UNECE Recommendation 1, the UN Layout Key (UNLK). This ensures that traders can choose the type of document technology that best meets their business requirements and technology capabilities and also provides a migration path for the adoption of new technologies.

UNeDocs is a cross domain project under TBG2 WG (Digital paper , http://www.uncefactforum.org/TBG/TBG2/tbg2.htm) and requires a close cooperation between and

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[16] Sue Probert. UNeDocs Scope Document. Version 3. -- DocNo: TBG2-2006-32-0-UNeDocs-Scope v3.0, UN/CEFACT/TBG/TBG2 Digital paper/UNeDocs; Michael Dill (TBG2 Chair). UNeDocs goes live - status report (draft 28-th January 2008); http://www.uncefactforum.org/TBG/TBG2/tbg2_unedocs.htm .

with the TBG WGs. The initial scope of the project will cover a set of core documents chosen by the project team. This set includes commercial, transport and customs documents, such as the list of typical document types shown in the Table 7 below.

Table 7. Typical documents types. (COO and Invoice are the matter of harmonization by APEC economies now, IMMTA -- International Multimodal Transport Association).

UNeDocs	UN/CEFACT DE 1001 Document codes
Quotation	310
Order	220
Export Cargo Shipping Instructions (ECSI)	340
Freight Forwarding Instructions (FFI)	610
Consignment Document Despatch Notice	N/A
Non-Negotiable Sea Waybill	712
Non-Negotiable IMMTA	N/A
Negotiable IMMTA	N/A
CMR (Road Consignment note)	730
Certificate Of Origin	861
Export Customs Declaration	830
Invoice	380

UN/CEFACT Integrated Framework of Standards for Paperless Trade

International trade transaction process. The international Trade Transaction Process consists of integrated and coordinated flows of information, goods and payments[17] (Fig. 19-23).

[17] The UN/CEFACT International Supply Chain Reference Model

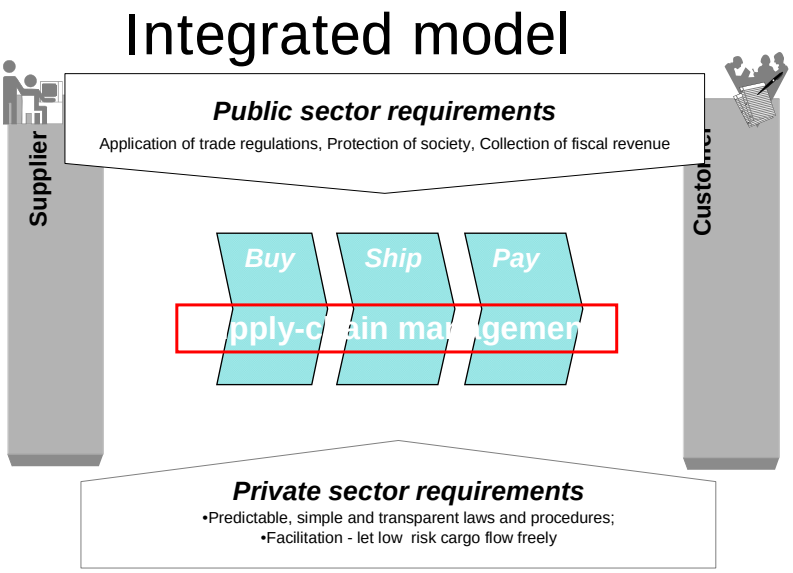

Fig. 19. Integrated model of International Trade Transaction Process.

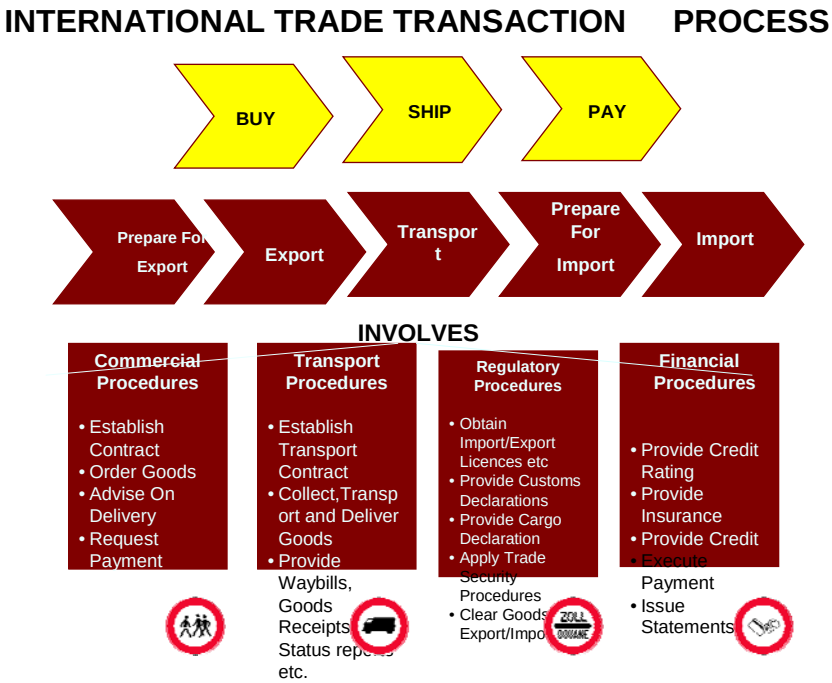

Fig. 20. International Trade Transaction Process.

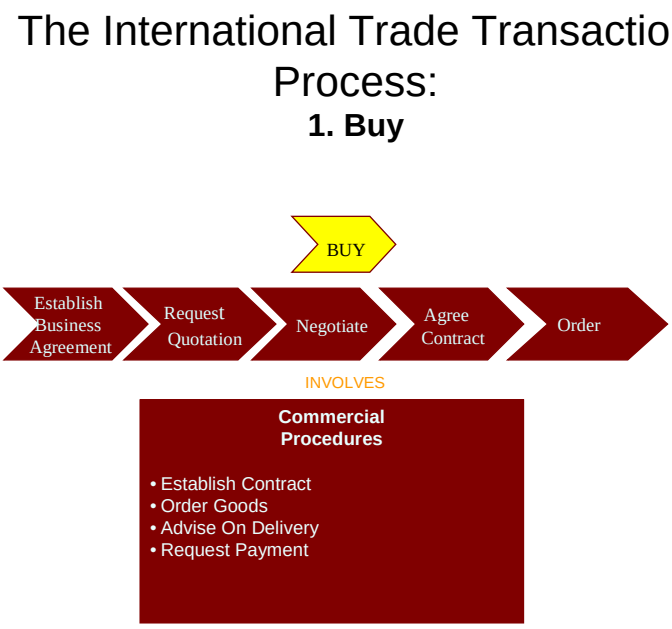

Fig. 21 . Stage "Buy" of International Trade Transaction Process

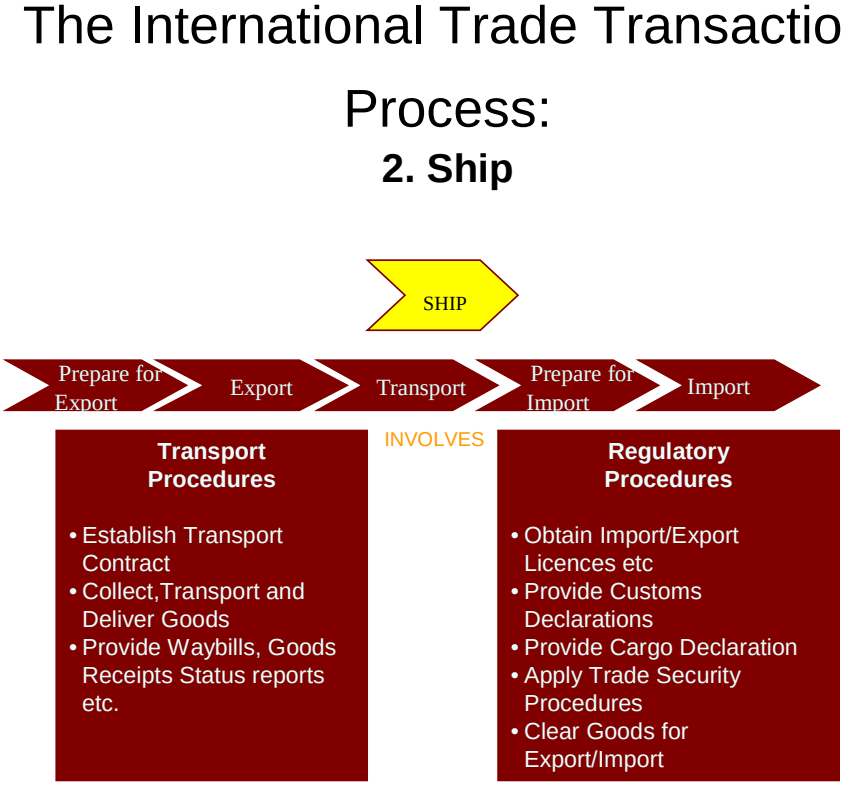

Fig. 22. Stage "Ship" of International Trade Transaction Problem.

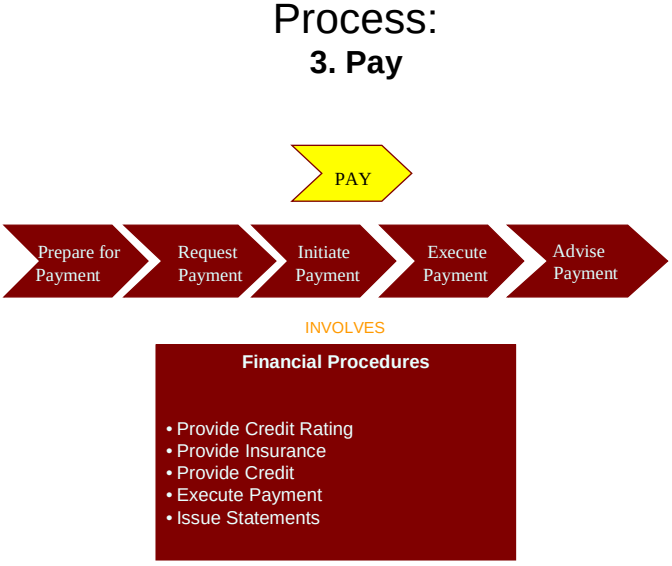

Fig.23. Stage "Pay" of International Trade Transaction Process.

The UN/CEFACT Integrated Framework of Standards for Paperless Trade (Fig. 24) includes the following layers:

(i) generic, including standards for paper and for electronic business;

(ii) standards for data interchange;

(iii) implementation; and

(iv) national and regional policies.

UNeDocs is based on an integrated data model that describes the information exchanged between the parties involved in an international supply chain operation. As has been successfully demonstrated in the ASEAN Single Window, these data models can be used to harmonize data requirements at the national and regional level. UN/CEFACT is now preparing a recommendation on Cross Border Data Harmonization.

UN/CEFACT has developed 3 stairways (or stages) of paperless trade each consisting of 5 phases (Fig. 25-27). Now stage “Paperless Trading” is realized.

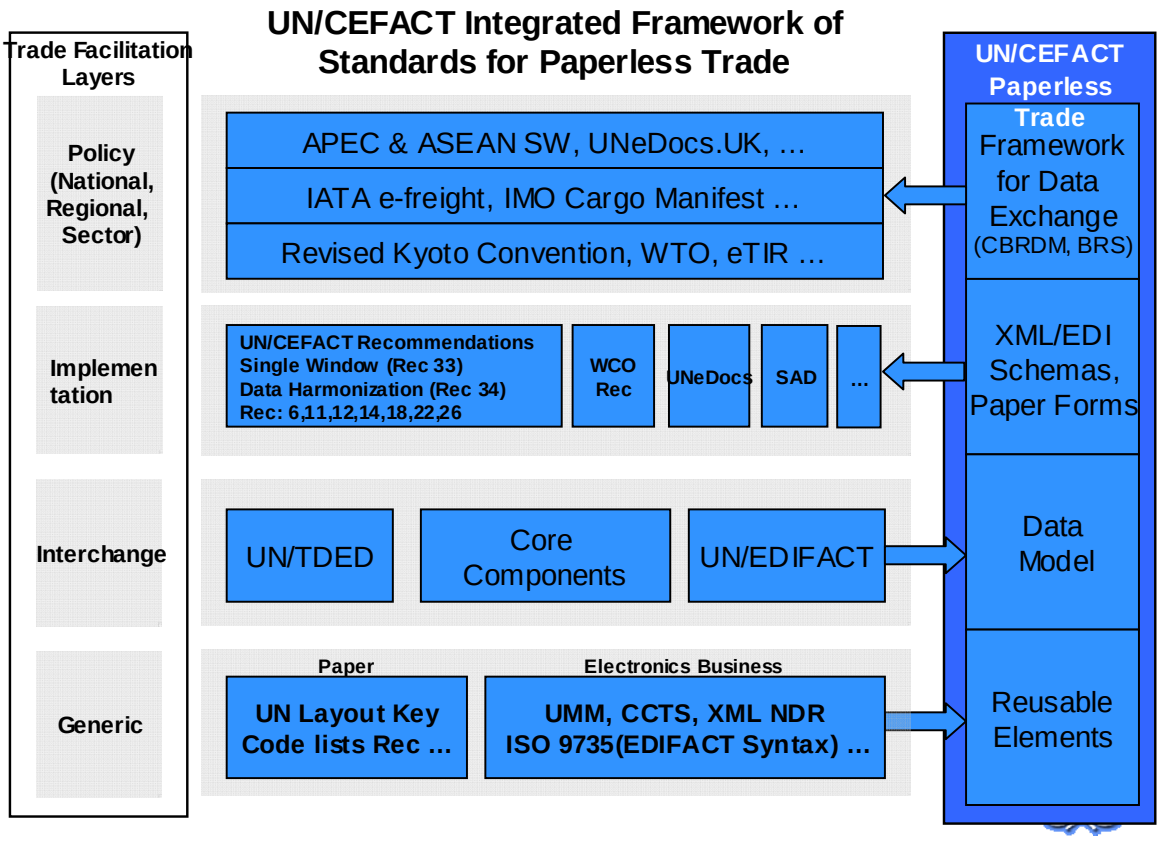

Fig. 24. UN/CEFACT Integrated Framework of Standards for Paperless Trade.

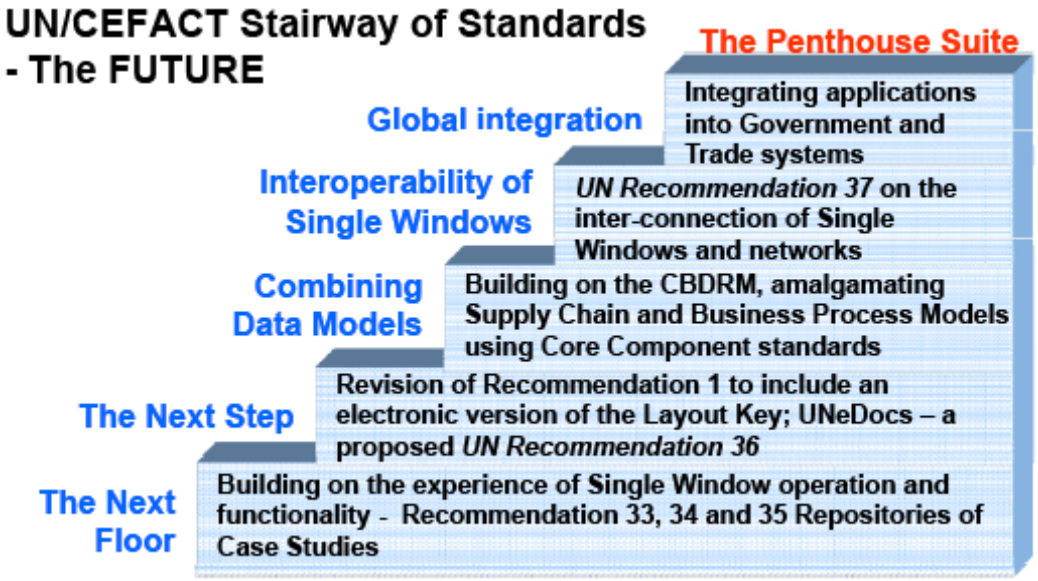

Fig.25. UN/CEFACT Stairway of Standards -- the future "The Penthouse Suite".

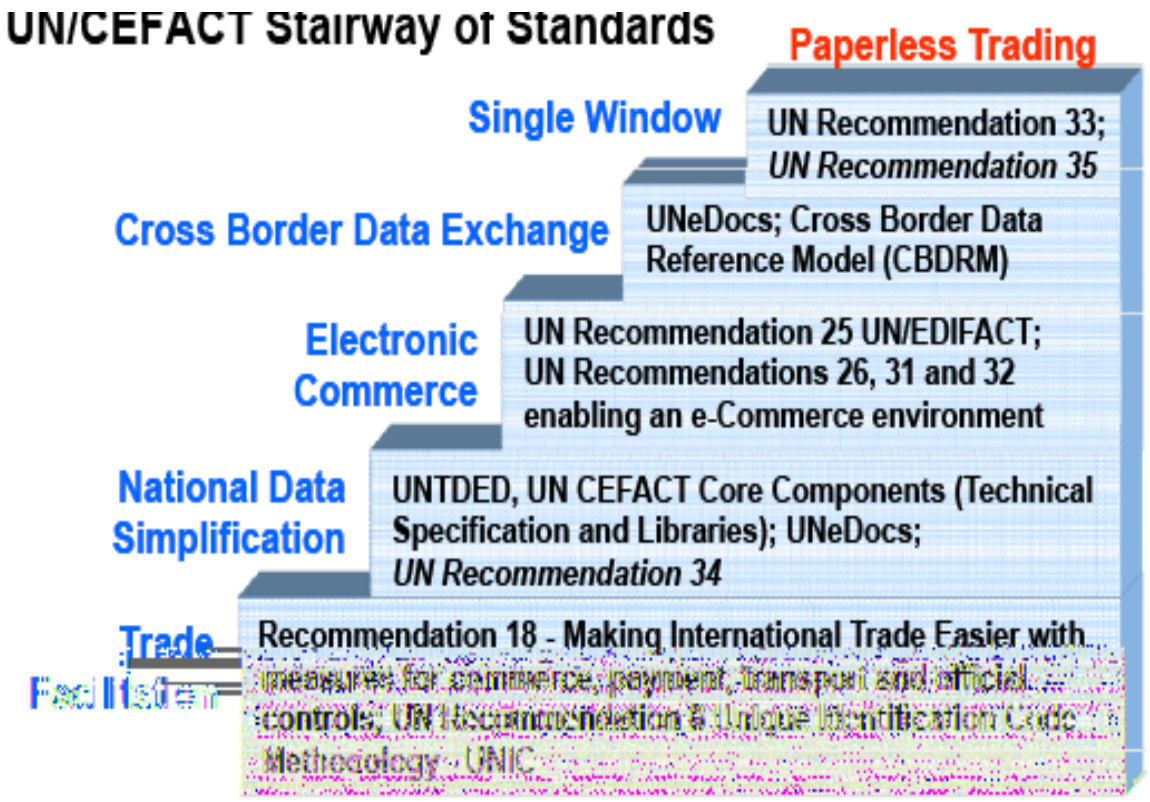

Fig.26. UN/CEFACT Stairway of Standards -- "Paperless Trading".

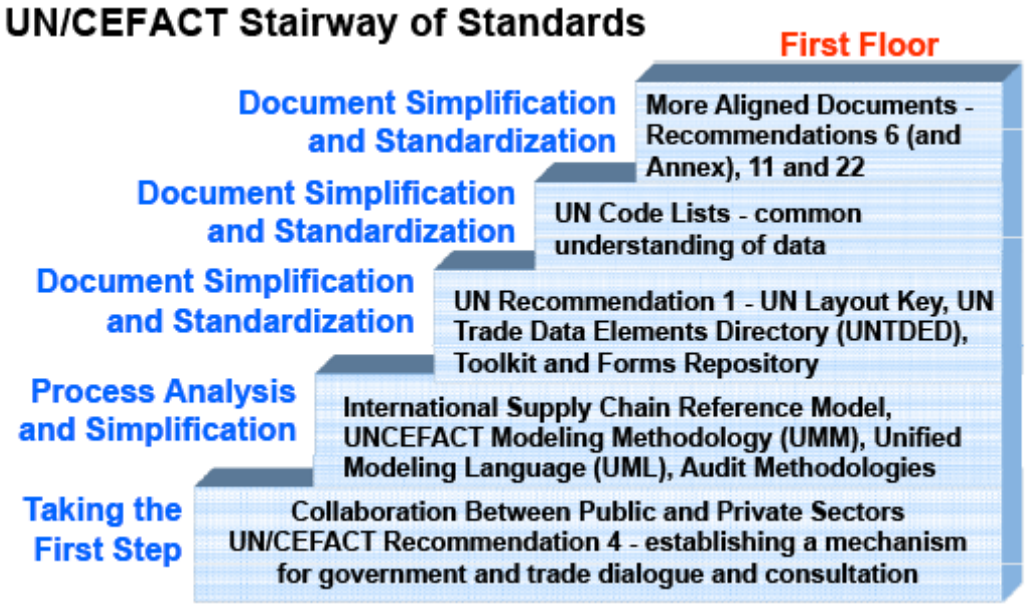

Fig.27. UN/CEFACT Stairway of Standards -- "First Floor".

Action plan for APEC e-Trade Hub Reference Model Realization

ASEAN work on single window gives good example how joint work of countries could be organized[18]. Taking into account this and other examples of countries' technical and scientific cooperation (say, space flights and labs, nuclear installations, etc.) following action plan could be proposed:

#	Actions	Actors	Date	Comment
Joint Project preparation				
1	Forming of international WG	APEC secretariat	January, 2009	
2	Meeting of economies heads to approve work on the APEC e-Trade hub	APEC Secretariat, Economies heads	June, 2009	
3	Meeting of economies' Economic ministers to approve	APEC secretariat, Economies' Economic ministers	December, 2009	

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#	Actions	Actors	Date	Comment
	Common Action Plan on APEC e-Trade hub			
4	Forming project office and its staff	APEC Secretariat	January 2010	
5	Development of project documentation (schedule, budget, staff etc.)	Project office	March 2010	
Project fulfillment				
6	APEC e-Trade hub technical and user documentation development	Project office, project staff	April 2010- April 2011	
	APEC e-Trade hub assembly and testing	Project office, project staff	May 2011- August 2011	
	Systems users training – businessmen and businesswomen	Project office, project staff	July 2011- August 2011	
	Pilot system exploitation	System operator, Project office, project staff		
Systems real life work demonstration to heads of economies at the APEC summit in 2012				
	Demonstration of the system to	System operator	January 2012	

#	Actions	Actors	Date	Comment
	participants of APEC Summit in Vladivostok			

Conclusion

APEC e-Trade Hub Reference Model identifies the required standards for transborder e-trade and provides a reference for those standards by defining the basic concepts used to develop them. It should serve as the basis for co-ordination of UN/CEFACT, WCO, APEC and EU work to omit work duplication and to plan e-Commerce and e-Trade projects for realization by APEC economies. It provides the framework for this co-ordination and planning for the integration of existing and emerging standards and the development of future standards. The Reference Model places existing electronic business standards and architectures in perspective.

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ANEXES

1. Glossary on international e-trade

Terms	Definitions
Aligned documents	Trade documents adhering to international documentary requirements and best business practices. Important standards and best practice for aligned trade documentation have been developed in the United Nations Economic Commission for Europe (UNECE). The UN has set up a Centre for Trade Facilitation and Electronic Business (UN/CEFACT) within the UNECE to developing and maintaining these standards. Today most documents used by advanced trading nations and logistics operators are based on these standards, for instance, The EU Single Administrative Document (SAD), the TIR carnet, the IATA Air Waybill or the IMO Bill of Lading. While the use of aligned trade documents has become a standard in advanced trading nations, the UN recognizes that transition economies and developing countries still uses non-aligned trade document systems that complicate procedures and unnecessarily increase the costs of the goods to be exported. This is a considerable impediment for exporters to successfully compete in the international markets. Source: http://unece.unog.ch/etrade/tkhome.aspx
Alignment of Trade Documents, The UN Toolkit for the	To assist trade facilitators to develop aligned trade documents the UN Regional Commissions have developed a set of tools and resources. The Toolkit consists of three components: 1. **Electronic Toolkit for the development of write-enabled paper documents**. Toolkit to develop PDF forms for trade document, the form fields can be made write-enabled. This allows a trader to fill in the document, print it with the data or email the document. 2. **Handbook and sample document forms**. Contains guidelines for trade facilitators to develop aligned documents, a standard UNLK grid in PDF format and sample forms of important trade documents in PDF format

	3. **Library of Resources for the alignment of Trade Documents.** The Library provides a collection of standards, guidelines and publications related to the alignment of trade documents Source: http://unece.unog.ch/etrade/tkhome.aspx
Brokerage {Business} Model	Brokers are market makers: they bring buyers and sellers together and facilitate transactions. Brokers play a frequent role in business-to-business (B2B), business-to-consumer (B2C), or consumer-to-consumer (C2C) markets. Usually a broker charges a fee or commission for each transaction it enables. The formula for fees can vary. Brokerage models include: 1. Marketplace Exchange -- offers a full range of services covering the transaction process, from market assessment to negotiation and fulfillment. Exchanges operate independently or are backed by an industry consortium. [Orbitz, ChemConnect] 2. Buy/Sell Fulfillment -- takes customer orders to buy or sell a product or service, including terms like price and delivery. [CarsDirect, Respond.com] 3. Demand Collection System -- the patented "name-your-price" model pioneered by Priceline.com. Prospective buyer makes a final (binding) bid for a specified good or service, and the broker arranges fulfillment. [Priceline.com] 4. Auction Broker -- conducts auctions for sellers (individuals or merchants). Broker charges the seller a listing fee and commission scaled with the value of the transaction. Auctions vary widely in terms of the offering and bidding rules. [eBay] 5. Transaction Broker -- provides a third-party payment mechanism for buyers and sellers to settle a transaction. [PayPal, Escrow.com] 6. Distributor -- is a catalog operation that connects a large number of product manufacturers with volume and retail buyers. Broker facilitates business transactions between franchised distributors and their trading partners. 7. Search Agent -- a software agent or "robot" used to search-out the price and availability for a good or service specified by the buyer, or to locate

	hard to find information. 8. Virtual Marketplace -- or virtual mall, a hosting service for online merchants that charges setup, monthly listing, and/or transaction fees. May also provide automated transaction and relationship marketing services. [zShops and Merchant Services at Amazon.com] Source: http://digitalenterprise.org/models/models.html#Brokerage
Electronic Trade Documents, United Nations (UNeDocs) Project	In response to the UN Millennium Declaration and the demands of both Governments and trade for increased use of information and communication technologies, UNECE in 2000 set up the United Nations electronic Trade Documents (UNeDocs) project to analyse the documentary issues of the supply chain and to develop solutions. Supported by Governments, industry associations and research institutes, the project developed an integrated concept for the global trade documentation system: The concept recognizes that paper documents will continue to be used for a long time and that countries or trade will not be adopting electronic trade documents at the same speed. Source: http://www.unece.org/etrades/unedocs
Reference Model	Is a notion used in standard conceptual computing models. It is an abstract representation of the entities and relationships involved in a problem space, and form the conceptual basis for the development of more concrete models of the space, and ultimately implementations, in a computing context. It thereby serves as an abstract template for the development of more specific models in a given domain, and allows for comparison between complying models. Instances of reference models include, among others: the Open Systems Interconnection Basic Reference Model (ISO/OSI), the Open Geospatial Consortium reference models, the Von Neumann architecture as a sequential computing referential model, and the US Federal Enterprise Architecture reference models. Source: http://en.wikipedia.org/wiki/Reference_model
Single Window System	A facility that allows parties involved in trade and transport to lodge standardized information and documents with a single entry point to fulfill all import, export, and transit-related regulatory requirements. If information is electronic then individual data elements should only be

	submitted once. Source: UN/CEFACT Recommendation No. 33 - Recommendation and Guidelines on establishing a Single Window , http://www.unece.org/cefact/recommendations/rec33
Trade facilitation	1. The simplification and harmonization of international trade procedures" where trade procedures are the "activities, practices and formalities involved in collecting, presenting, communicating and processing data required for the movement of goods in international trade Source: WTO 2. The simplification, standardization and harmonization of procedures and associated information flows required to move goods from seller to buyer and to make payment Source: UN/CEFACT, see UN/CEFACT (2001) *Compendium of Trade Facilitation Recommendations*, http://www.unece.org/cefact/docum/download/01comp.pdf 3. Occasionally, the term is extended to address a wider agenda in economic development and trade and may include: improvement of transport infrastructure, removal of government corruption, reduction of customs tariffs, removal of inverted tariffs, removal of non-tariff trade barriers, and export marketing and promotion. Regulatory procedures in the control of international trade go beyond the customs area and include fiscal controls, safety and security measures, environment and health checks, consumer protection mechanisms, and trade policy regulations. Source: http://en.wikipedia.org/wiki/Trade_facilitation , http://www.wto.org/english/thewto_e/whatis_e/eol/e/wto02/wto2_69.htm#note2
The Open-edi Reference Model	The Open-edi Reference Model identifies the required standards for Open-edi and provides a reference for those standards by defining the basic concepts used to develop them. It serves as the basis for co-ordination of work between the different agencies involved in EDI standardization. It provides the framework for this co-ordination and for the integration of

	existing and emerging standards and the development of future standards. The Open-edi Reference Model uses two views to describe the relevant aspects of business transactions: 1. the Business Operational View (BOV); 2. the Functional Service View (FSV). The BOV, addresses the aspects of: a) the semantics of business data in business transactions and associated data interchanges; b) the rules for business transactions, including: --operational conventions; .--agreements; .--mutual obligations, which apply to the business needs of Open-edi. The FSV addresses the supporting services meeting the mechanistic needs of Open-edi. It focuses on the Information Technology aspects of: a) functional capabilities; b) service interfaces; c) protocols. Such functional capabilities, services interfaces and protocols include: --capability of initiating, operating and tracking the progress of Open-edi transactions; .--user application interface;

	.--transfer infrastructure interface; .--security mechanism handling; .--protocols for inter working of information technology systems of different organizations; .--translation mechanisms. Source: Information technology — Open-edi reference model -- INTERNATIONAL ISO/IEC STANDARD 14662 , Second edition, 2004-05-15
Aligned paper Documents, UNeDocs	UN/CEFACT has set up the United Nations electronic Trade Documents (UNeDocs) project to develop the standards for paper and electronic trade documents. UNeDocs provides a conceptional framework for developing aligned paper trade documents based on international trade standards and the subsequent development of the electronic equivalents of the paper document. UNeDocs designs documents on the basis of international trade procedures, the United Nations Layout Key (UNLK) and the the United Nations Trade Data Elements Directory (UNTDED), ISO standard 7372. These two definitions, the document layout based on the UNLK and the semantic content of the document based on the UNTDED provide the basis for a later definition of the electronic equivalent of the trade document in UN/EDIFACT or XML format. UN/EDIFACT and XML are today's most widely used electronic business protocols, and provide access and connectivity to e-business systems and electronic supply chain management. Each UNeDocs electronic trade document is developed on the basis of an aligned and simplified paper document layout. Documents developed on the basis of the UN Toolkit for the Alignment of Trade Documents are compatible with the UNeDocs concept and are prepared for paperless trade. Source: http://unece.unog.ch/etrade/tkhome.aspx
Authentication	**Authentication** is the act of establishing or confirming something or someone as authentic. In computer security, **authentication** (Greek: *αυθεντικός*, from 'authentes'='author') is the process by which a computer,

	computer program, or another user attempts to confirm that the computer, computer program, or user from whom the second party has received some communication is, or is not, the claimed first party. A blind credential, in contrast, does not establish identity at all, but only a narrow right or status of the user or program. In a Web of trust "authentication" is a way to ensure users are who they say they are—that the user who attempts to perform functions in a system is in fact the user who is authorized to do so. To distinguish authentication from the closely related term authorization, the short-hand notations **A1** (authentication) and **A2** (authorization) are occasionally used. The problem of authorization is often thought to be identical to that of authentication; many widely adopted standard security protocols, obligatory regulations, and even statutes are based on this assumption. However, there are many cases in which these two problems are distinct. One familiar example is access control. A computer system supposed to be used only by those authorized must attempt to detect and exclude the unauthorized. Access to it is therefore usually controlled by insisting on an authentication procedure to establish with some established degree of confidence the identity of the user, thence granting those privileges as may be authorized to that identity. Common examples of access control involving authentication include: • withdrawing cash from an ATM. • controlling a remote computer over the Internet. • using an Internet banking system. However, note that much of the discussion on these topics is misleading because terms are used without precision. Part of this confusion may be due to the 'law enforcement' tone of much of the discussion. No computer, computer program, or computer user can 'confirm the identity' of another party. It is not possible to 'establish' or 'prove' an identity, either.

	There are tricky issues lurking under what appears to be a straightforward surface. It is only possible to apply one or more tests which, if passed, have been previously declared to be sufficient to proceed. The problem is to determine which tests are sufficient, and many such are inadequate. There have been many instances of such tests having been spoofed successfully; they have by their failure shown themselves, inescapably, to be inadequate. Many people continue to regard the test(s) -- and the decision to regard success in passing them—as acceptable, and blame their failure on 'sloppiness' or 'incompetence' on the part of someone. The problem is that the test was supposed to work in practice -- not under ideal conditions of no sloppiness or incompetence—and did not. It is the test which has failed in such cases. Consider the very common case of a confirmation email which must be replied to in order to activate an online account of some kind. Since email can easily be arranged to go to or come from bogus and untraceable addresses, this is just about the least authentication possible. Success in passing this test means little, without regard to sloppiness or incompetence. Source: wikipedia.
Certification Authority	Person who or entity which issues certificates or provides other services related to electronic signatures to the public.
Consumer Confidence	
Copyright	Is a set of exclusive rights granted by governments to regulate the use of a particular expression of an idea or information. At its most general, it is literally "the right to copy" an original creation. In most cases, these rights are of limited duration. The international symbol for copyright: ©. Copyright may subsist in a wide range of creative or artistic forms or "works". These include poems, plays, and other literary works, movies, choreographic works (dances, ballets, etc.), musical compositions, audio recordings, paintings, drawings, sculptures, photographs, software, radio and television broadcasts of live and other performances, and in some jurisdictions industrial designs. Copyright is a type of intellectual property;

	designs or industrial designs may be a separate or overlapping form of intellectual property in some jurisdictions. Source: wikipedia.
Deminimis (de minimis) level	An amount small enough to be of no concern. Source: http://web.em.doe.gov/takstock/glossary.html
Electronic commerce (EC)	Electronic commerce, e-commerce or ecommerce consists primarily of the distributing, buying, selling, marketing, and servicing of products or services over electronic systems such as the Internet and other computer networks. The information technology industry might see it as an electronic business application aimed at commercial transactions. It can involve electronic funds transfer, supply chain management, e-marketing, online marketing, online transaction processing, electronic data interchange, automated inventory management systems, and automated data-collection systems. It typically uses electronic communications technology such as the Internet, extranets, e-mail, E-books, databases, and mobile phones. Source: wikipedia
Electronic Data Intergange (EDI)	**Electronic Data Interchange** (**EDI**) is the computer-to-computer exchange of structured information, by agreed message standards, from one computer application to another by electronic means and with a minimum of human intervention. In common usage, EDI is understood to mean specific interchange methods agreed upon by national or international standards bodies for the transfer of business transaction data, with one typical application being the automated purchase of goods and services. Despite being relatively unheralded, in this era of technologies such as XMLservices, the Internet and the World Wide Web, EDI is still the data format used by the vast majority of electronic commerce transactions in the world. Source: wikipedia
Electronic signature	In recent years, the terms *electronic signature* and digital signature have come into widespread, and somewhat confused, use. **Electronic signature** is often used to mean either a signature imputed to a text via one or more of several electronic means, or cryptographic means to add non-repudiation and message integrity features to a document. *Digital signature* usually refers specifically to a cryptographic signature, either on a document, or on

	a lower-level data structure. The confusion in terminology is unsatisfactory in many respects, and will remain so until usage, especially in statutes and regulations, becomes more standardized. Source: wikipedia
Encryption	In cryptography, **encryption** is the process of obscuring information to make it unreadable without special knowledge. While encryption has been used to protect communications for centuries, only organizations and individuals with an extraordinary need for secrecy had made use of it. In the mid-1970s, strong encryption emerged from the sole preserve of secretive government agencies into the public domain, and is now employed in protecting widely-used systems, such as Internet e-commerce, mobile telephone networks and bank automatic teller machines. Encryption can be used to ensure secrecy, but other techniques are still needed to make communications secure, particularly to verify the integrity and authenticity of a message; for example, a message authentication code (MAC) or digital signatures. Another consideration is protection against traffic analysis. Encryption or software code obfuscation is also used in software copy protection against reverse engineering, unauthorized application analysis, cracks and software piracy used in different encryption or obfuscating software. Source: wikipedia
Information and Communications Technology (ICT)	**Information technology** (IT) or **Information and communication(s) technology** (ICT) is a broad subject concerned with technology and other aspects of managing and processing information, especially in large organizations. In particular, IT deals with the use of electronic computers and computer software to convert, store, protect, process, transmit, and retrieve information. For that reason, computer professionals are often called **IT specialists**, and the division of a company or university that deals with software technology is often called the **IT department**. Other names for the latter are information services (IS) or management information services (MIS). Source: wikipedia
Interconnection/	A charge levied by network operators on service providers for interconnection with their network.

Interconnection charge	
Internet	A worldwide network of networks that all use the TCP/IP communications protocol and share a common address space. First incarnated as the ARPANET in 1969, the Internet has metamorphosed from a military internetwork to an academic research internetwork to the current commercial internetwork. It commonly supports services such as email, the World Wide Web, file transfer, and Internet Relay Chat. The Internet is experiencing tremendous growth in the number of users, hosts, and domain names.
Internet Service Provider (ISP)	1. A business that delivers access to the Internet, usually for a monthly fee. PSI, UUNET, and Netcom are examples of established ISPs but there are thousands of smaller ones all around the world. 2. A business that provides Internet services, such as web site hosting, or web site development
Interoperability	The ability of software and hardware on multiple machines from multiple vendors to communicate meaningfully.
Liability	In the most general sense, a **liability** is anything that is a hindrance, or puts one at a disadvantage. Source: wikipedia
Mobile commerce	**Mobile commerce, m-commerce** or **mcommerce** stands for electronic commerce made through mobile devices. M-commerce is currently mainly used for the sale of mobile phone ring-tones and games, although as 3G/UMTS services roll out it is increasingly used to enable payment for location-based services such as maps, as well as video and audio content, including full length music tracks. Other services include the sending of information such as football scores via SMS. Currently the main payment methods used to enable m-commerce are: • premium-rate calling numbers, • charging to the mobile telephone user's bill or • deducting from their calling credit, either directly or via reverse-charged SMS. 'M-commerce' was coined in the late 1990s during the dot-com boom. The

	idea that highly profitable M-commerce applications would be possible though the broadband mobile telephony provided by 2.5G and 3G cell phone services was one of the main reasons for hundreds of billions of dollars in licensing fees paid by European telecommunications companies for UMTS and other 3G licenses in 2000 and 2001. Other examples of M-commerce applications are information-on-demand systems like news services or stock tickers, banking and stock brokerage applications by SMS, WAP or iMode. Source: wikipedia.
Network	A configuration of data processing devices and software connected for information interchange.
Privacy	Is the ability of an individual or group to stop information about themselves from becoming known to people other than those whom they choose to give the information. Privacy is sometimes related to anonymity although it is often most highly valued by people who are publicly known. Privacy can be seen as an aspect of security—one in which trade-offs between the interests of one group and another can become particularly clear. The right against unsanctioned intrusion of privacy by the government, corporations or individuals is part of many countries' laws, and in some cases, constitutions or privacy laws. Almost all countries have laws which in some way limit privacy, for example taxation normally requires passing on information about earnings. In some countries, individual privacy may conflict with freedom of speech laws and some laws may require public disclosure of information which would be considered private in other countries and cultures. Privacy may be voluntarily sacrificed, normally in exchange for perceived benefits, but often with little benefit and very often with specific dangers and losses. An example of voluntary sacrifice is entering a competition; a person gives personal details (often for advertising purposes), so they have a chance of winning a prize. Another example is where information voluntarily shared is later stolen or misused such as in identity theft. Source: wikipedia.
Public Key Infrastructure	In cryptography, a **public key infrastructure** (**PKI**) is an arrangement, which provides for third-party vetting of, and vouching for, user identities.

(PKI)	It also allows binding of public keys to users. This is usually carried out by software at a central location together with other coordinated software at distributed locations. The public keys are typically in certificates. The term is used to mean both the certificate authority and related arrangements as well as, more broadly and somewhat confusingly, the use of public key algorithms in electronic communications. The latter sense is erroneous since PKI methods are not required to use public key algorithms. Source: wikipedia
Readiness	Is the degree to which an economy or community is prepared to participate in the digital economy. Every economy, regardless of its level of development, presents a *readiness profile* on the global stage, composed of its national policies, level of technology integration, and regulatory practices. Readiness is assessed by determining the relative standing of the economy in the areas that are most critical for e-commerce participation
Secure electronic Commerce Environment (SECE)	SECE will enable secure and reliable EC transactions between companies and consumers over open networks, such as the Internet. Source: Hitachi
Secure Electronic Transaction (SET)	Is a standard protocol for securing credit card transactions over insecure networks, specifically, the Internet. SET was developed by VISA and MasterCard (involving other companies such as GTE, IBM, Microsoft and Netscape) starting in 1996. SET makes use of cryptographic techniques such as digital certificates and public key cryptography to allow parties to identify themselves to each other and exchange information securely. SET was heavily publicized in the late 1990's as the credit card approved standard, but failed to win market share. Reasons for this include; need to install client software (an eWallet), cost and complexity for merchants to offer support and comparatively low cost and simplicity of the existing, adequate SSL based alternative. Source: wikipedia
Secure Sockets Layer protocol (SSL)	Security protocol for encrypted transmission over the Internet. The protocol allows client/server applications to communicate in a way that cannot be easily eavesdropped. Servers are always authenticated and

	clients are optionally authenticated. It sets up a secure end-to-end link over which http or any other application protocol can operate. **SSL with third party certification:** Third party certification provides the additional security (authentication) to the SSL required for electronic commerce. Self-generated certificates are not considered to provide the necessary level of security. By making a survey of SSL-based sites, excluding those without third party certification makes it possible to get an indication of the number of electronic commerce sites (e.g. Netcraft Web Surveys, http://www.netcraft.com/Survey/)
Security	Is the condition of being protected against danger. In the general sense, security is a concept similar to safety. The nuance between the two is an added emphasis on being protected from dangers that originate from outside. Individuals or actions that encroach upon the condition of protection are responsible for the breach of security. Source: wikipedia
Small and Medium Enterprises (SMEs)	Companies whose headcount or turnover falls below certain limits. The abbreviation SME occurs commonly in the EU and in international organizations, such as the World Bank, the United Nations and the WTO. The term Small or Medium sized Business or SMB has become more standard in a few other countries. EU Member States traditionally had their own definition of what constitutes an SME, for example the traditional definition in Germany had a limit of 500 employees, while (for example) in Belgium it could have been 100. But nowadays the EU has started to standardize the concept. Its current definition categorizes companies with fewer than 50 employees as "small", and those with fewer than 250 as "medium". As of 2005, Germany will use the definition of the European Commission. Business enterprises of fewer than 10 employees often class as SOHO (for Small office/home office). In most economies, smaller enterprises predominate. In the EU, SMEs comprise approximately 99% of all firms and employ between them about

	65 million people. SMEs, in contrast to big business, have a reputation for innovation. For this reason, and because of their difficulties in attracting capital, national and regional fostering of SMEs commonly occurs. In the United States there is no standard definition for a small business. Generally it is determined by the industry in which it competes, where income and number of employees will determine whether a company is a small business or not. Many government contracts are "set aside" (i.e., competition is limited to small businesses only, most often involving services or minor construction). Source: wikipedia
Trust to e-commerce	Trust is based on experience over time; it can either strengthen or weaken. The process of trust begins when one perceives indications that an online company maybe trustworthy. These indications are known as "forms" (Cheskin, 1999). Manners, professionalism, and sensitivity are examples of these indications. Once the forms representing trustworthiness are strengthened over time, they are transformed into "character traits". These traits include dependability, honesty, and reliability. Once an online company possesses the "character", one will be more likely to purchase items from them. The experience over time is very important in a commercial relationship(Cheskin, 1999). Internet security and privacy are issues that must be first addressed. In satisfying people on these issues, the most important step is to building trust with e-commerce. There are six types of forms for e-commerce trust: 1) Seals of Approval Symbols of security, such as MasterCard, reassure that proper security measures have been put into place. 2) Brand The credibility of the online company based on reputation, the promise to

deliver certain criteria and a person's previous experience dealing with the company.

3) Navigation

The ease of finding what you want

4) Fulfillment

Clear explanations of how orders are processed and what to do if there are any problems

5) Presentation

The design of the site must present professionalism and quality.

6) Technology

The site uses new technology to indicate professionalism.

Three Forms are Key for E-Commerce Trust

Navigation, the ease of finding information, is the key form needed for e-commerce trust. A well-known brand and fulfillment are the other two forms involved in e-commerce trust. Navigation must be associated with one or both of the other forms in order for an online business to be consider trustworthy. Strong navigation increases a user's perception that a web site will meet a user's needs.

If an online business is strong in all three forms, it does not mean it will be perceived the most trustworthy. For example, Barnes and Noble is considered to be strong in all three forms but was considered less trustworthy than a Amazon.com, whose site lacks fulfillment (Cheskin, 1999).

For online businesses with lesser-known or newer brands, navigation and fulfillment are key to gaining e-commerce trust. These businesses must have sites with strong navigation and strong fulfillment in order to compete with the well-known brands. As navigation and fulfillment improve, so

	does e-commerce trust.Source: Fred Lee
United Nations Commission on International Trade Law (UNCITRAL)	Established by the United Nations General Assembly in 1966 to reduce or remove obstacles to international trade created by disparities in national laws. Its mandate is to work towards a progressive harmonization and unification of the law of international trade
World Intellectual Property Rights Organization (WIPO)	Specialized intergovernmental organization of the United Nations system of organizations. Responsible for the promotion of the protection of intellectual property throughout the world through cooperation among States, and for the administration of various multilateral treaties dealing with the legal and administrative aspects of intellectual property. The main texts adopted by WIPO are the Trademark Law Treaty, the WIPO Copyright Treaty and the WIPO Performances and Phonograms Treaty and the Agreement between the World Intellectual Property Organization and the World Trade Organization.
World Trade Organization (WTO)	International organization dealing with the global rules of trade between nations. Its main function is to ensure that trade flows as smoothly, predictably and freely as possible. **WTO Information Technology Agreement (ITA)** WTO Ministerial Declaration on Trade in Information Technology Products, Singapore, 13 December 1996. The Declaration provides for the elimination of customs duties and other duties and charges on information technology products. **WTO Basic Telecom Agreement** - Results of the 3-year WTO negotiations on market access for basic telecommunications services. Annexed to the Fourth Protocol of the General Agreement on Trade in Services. Includes market opening commitments and commitments on regulatory principles of 72 countries across the globe. WTO Members were able to decide individually whether or not to file a Most Favored Nation (M.F.N) exemption on measures affecting trade in basic telecommunications services. **WTO Standstill Agreement for Tariffs** During the Geneva Ministerial Declaration on Global Electronic commerce held in May 1998, the Ministers declared that members would continue their current practice of

	not imposing customs duties on electronic transmissions, at least until the Third Session of the General Council in December 1999

2. National e-commerce system

Source:

Each APEC economy can build its own **National Electronic Commerce System** (NECS) model using notions from technical, functional and institutionalization models.

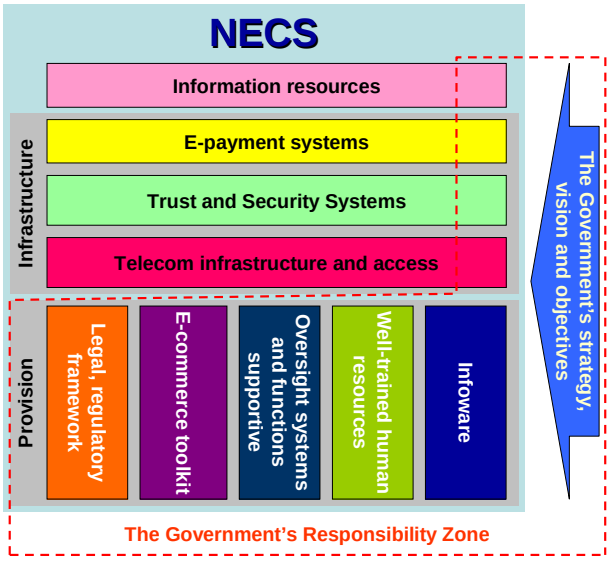

Fig. 1. Russian model of NECS.

Russian NECS model, for instance, was developed (see fig. 1 above) by Russian IT Association (RITA) in 2006 on the base of technical, functional and institutional models of e-commerce system for use in Russia. It is the set of following components:

- Assembly of NECS e-commerce systems, which are information resources or e-trade places.
- NECS infrastructure including:
    - E-payment systems;
    - Trust and security systems;
    - Telecom infrastructure and access.

- Set of facilities enabling NECS design, development and functioning (supportware or provisions) which include:

    - E-commerce legal and regulatory framework (laws, regulations, standards and technical reglaments)
    - E-commerce toolkit consists of guidelines, concepts, standards, methodologies for each stage and phase of e-commerce system and NECS life cycle. It includes also some governance documents – E-commerce strategy, vision and objectives template, which is the frame for each APEC member-economy and APECS as a whole to develop their own E-commerce strategy, vision and objectives.
    - Supportive, well-trained e-commerce systems human resources
    - E-commerce infoware (glossaries, handbooks, taxonomies, codes, information on tenders, registers of unfaire suppliers, e.a.)

NECS deployment program framework must put in place four parallel tracks and ten interrelated building blocks (fig. 5)[19].

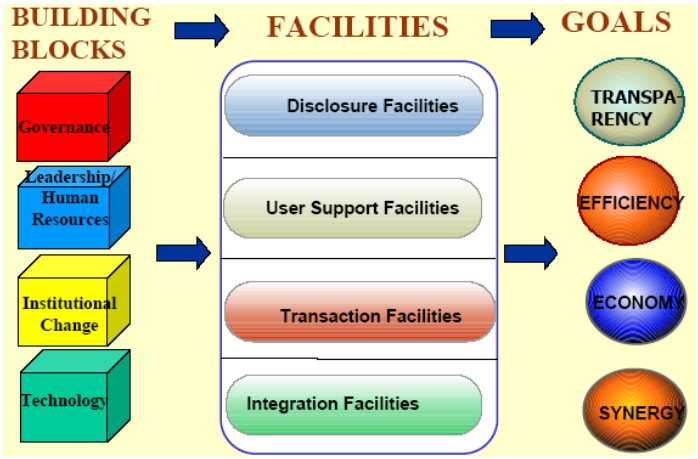

Fig. 2. National e-Commerce System's deployment program concept.

(I) Governance track consists of:

- (1) **Legal and Regulatory Framework.** As above for NECS model.
- (2) **Steering, Oversight Organizations.** As above for NECS model.

[19] http://wbln0018.worldbank.org/OCS/egovforum.nsf/main/home

(II) Human resources track consists of:

- (3) **Supportive, Well-Trained Human.** As above for NECS model.

(III) Institutions track consists of:

- (4) **Redesigned Work Flows**. As above for institutelisation models.
- (5) **Uniform Data Schemes**. As above for institutelisation models.
- (6) **Functioning NECS market**. As above for institutelisation models.

(IY) Technology track consists of:

- (7) **Telecommunications Infrastructure**. As above in layered technical model of e-commerce systems. Infrastructure in general and telecommunications infrastructure in particular are obviously serious constraints to the spread of NECS. If transport infrastructure is poor, deliveries will take too long and interest in NECS will decrease. In Latin America, for example, orders take an average of five days to be delivered (vs. 48 hours in the US) And without adequate telecommunications infrastructure, the cost/service tradeoffs for electronic commerce deteriorate considerably.
- (8) **Access Technology Infrastructure**. As above in layered architecture of e-commerce systems. Businesses need telephone lines and PCs with Internet access to participate in NECS. Ideally, each Purchasing Worker (PW) would have such access at his/her desktop, in which case internal networks connecting the various PW stations within each business would be desirable. However this is by no means indispensable from the start. For tendering transactions, which at the business level are not very numerous, one access point per purchasing business could suffice at the beginning. In the initial stages, furthermore, specialized EC centers for SME that combine access to Internet, training of staff in EC, and technical assistance on specific transactions can be considered as a suitable design alternative. Similarly, the presumption that NECS may discriminate against potential suppliers that have no Internet access (or for whom that access is prohibitively expensive) should be carefully studied before being accepted as an impediment to introduction of NECS. Obviously, if Internet access is simply not available, this is a larger issue of national information infrastructure (NII) that impinges not just on the introduction or NECS but on many other aspects of the economy. NECS alone cannot be relied upon for

resolution of this issue, but it can feature prominently in an overall economic argument for telecommunications sector reform. The issue of potential net economic disadvantage for Local, minority and SME Suppliers and micro enterprises as a result of the economy's conversion to e-business goes far beyond NECS and indeed may be one of the most tangible indicators of the so called "digital divide". At the level of an NECS program, however, there are several ways to deal with the issue of cost-based discrimination from electronic systems:

- The e-tendering facility operator (either the government or a contractor to government in most cases) can provide direct NECS system access at designated facilities, at subsidized, gradually escalating costs (which could start at zero). Small supplier training and support programs can be offered at the same facilities. The fee structure can be designed to encourage self-graduation upon reaching specified business volume thresholds (data easily obtainable from the NECS system).
- The e-tendering system can be designed to accept off line paper or electronic mail documents, with clear procedures on handling sequence, filing, and reproduction vis-à-vis electronic documents.
- In the case of e-purchasing systems, access infrastructure can facilitate access by small and special suppliers first by adopting open standards for e-catalog content, second by subsidizing directly or indirectly the training and catalog development work of small suppliers, and third, by requiring e-purchasing marketplaces to provide preferential visibility and pricing features to special groups in accordance with the law.

- (9) **NECS Software**. The following key considerations with respect to the acquisition or development of NECS software systems are worth bearing in mind:

  - Businesses rarely have all the skills, processes, tools, financing instruments, and management practices required to develop and maintain industrial-strength software systems.
  - A typical case in many developing country businesses is that of an business with a cadre of highly competent software engineers, hopefully experienced in use of CASE technology, overburdened with ongoing in-house systems work, who nonetheless stand ready and eager to develop the EC system for internal use. Unless this technical team has specific development experience

with Internet technology, a tradition and discipline for professional software engineering work, dedicated technical management and staff, and financing sources that transcend the initial development effort, chances are that a better strategy is to contract out the development the EC software system. The same professional standards should be required from in-house software development teams than from private contractors.

- A sure sign of runaway risk is when in-house teams are exempt from the controls, processes (for testing and documentation, for example), quality standards, and technical audit requirements that would be customary in large software development contracts with a private contractor.
- Adoption of NECS software developed by another public agency in the same or a foreign country must be done only after full consideration, and proper long-term financing, of technical support and maintenance services on a par with a commercial contract. Intellectual property rights and licensing restrictions should be considered with equal or greater formality than in commercial transactions, as well as issues of documentation, training, and risk from key staff rotation at either the sourcing or recipient agencies.
- Adoption of commercial software as part of an outsourcing contract for e-marketplace operation should be preceded by benchmark testing of the software to assure compliance with local laws and regulations and with requirements of the oversight system.

- (10) **Back Office Systems**. Integration of NECS and back office systems such as order tracking, receiving, inventory control, and accounting is the logical next building block of NECS. Without integration of back office systems the potential benefits of NECS remain severely curtailed. Efficiency gains in the domain of the NECS system can even be negated by even larger inefficiencies in manual interfaces with back-office systems.

Phasing the implementation of NECS in such a way as to keep in balance the burden of change with the evolving capacity of the corps of companies procurement officers is a real class act. Options are of course too numerous and country-specific. Perhaps the most important policy dilemma in phasing the implementation of NECS is whether to take the big bang or the gradual approach with respect to the simultaneous introduction of new regulations, new procedures, new systems and new technology. The big bang approach holds that if people are going to be under change-induced stress, they may as well be so for more rather than less change. For example, if a

new performance evaluation system for public procurement is being introduced, perhaps the best time to do so is concurrently with the system and technology changes inherent in switching to NECS. A gradual approach would be to design incremental change "packages" (of systems, regulations, procedures, and technology) commensurate with perceived capacity changes induced by the education and training effort. Fortunately, NECS systems lend themselves to phased implementation. For instance the phases of E-Tendering System implementation are:

- A **first stage** may be started, as a public procurement announcement system based on Internet. Such system is not very complex technologically and requires minimum or no legislative change.
- In a **second stage** some of the transaction flows involved in public procurement are converted from paper to electronic processing. Conservatively, these flows should be those with lower legal risk such as the online registration of suppliers and the online distribution of bidding documents to potential bidders.
- A **third stage** involves conversion to full electronic processing and requires substantially more complex technology, operating, and legal/regulatory infrastructure. Under such system all pre-bidding steps are accomplished electronically — notice/solicitation, invitation, registration, purchase of bidding documents, clarifications, modifications to process or substance of the procurement; and access to support information. Furthermore, submission of bids, opening of bids, filing of minutes of the bidding session, recording of the award decision, reception and filing of complaints, and notice of disposition of complaints, are all done electronically. Paper bids may still be acceptable both as a transitional device and to avoid complaints of skill or technology-based discrimination, but lag times are not paper-based any more. Legal, regulatory and operational frameworks specific to public NECS are incrementally required for third-stage e-tendering systems.
- A **fourth stage**, in addition to full electronic processing of procurement transactions, adds to e-tendering systems highly developed support and oversight systems.

Potential country NECS projects, whether or not financed by the Country's State Bank or international development organizations, would need to be very country-specific and consequently include variable combinations of the following broad components: a) NECS strategy formulation and Program design; b) NECS change management and process re-engineering; c) NECS technology infrastructure and systems development; d) formulation of NECS legal and regulatory frameworks; b) establishment of NECS markets through competitively awarded partnerships, concessions, or licenses. Governments need to make an early policy decision on the extent and

conditions of private sector financing of e-marketplaces. Since governments are frequently the largest buyers in particular economies, the business case for operation of e-marketplaces will certainly be considered by the private sector. In many countries, the prospect of a monopoly or oligopoly concession on public e-tendering transactions, for example, will be sufficient to generate competition among private sector operators and full investment financing by the winner.

3. Tools available to assist in implementing a single window

Source: UN/CEFACT. RECOMMENDATION No. 33 «ESTABLISHING A SINGLE WINDOW to enhance the efficient exchange of information between trade and government". ANNEX D

When implementing a Single Window, governments and trade are strongly encouraged to consider the use of relevant recommendations, standards and existing tools that have been developed over the past number of years by intergovernmental agencies and international organisations such as UNECE, UNCTAD, WCO, IMO, ICAO and the ICC. Some of the instruments in this category are described below, listed by the organizations in charge of their use.

A. UNITED NATIONS CENTRE FOR TRADE FACILITATION AND ELECTRONIC BUSINESS (UN/CEFACT), UNECE

In its capacity as the international focal point for trade facilitation standards and recommendations, UNECE, through its Centre for Trade Facilitation and Electronic Business (CEFACT), develops and maintains instruments meant to reduce, simplify, harmonize and automate procedures, information flow and paperwork in international trade. Some of the main Recommendations in this respect are as follows[20]:

Simplification and Harmonization of Trade Procedures

Recommendation Number 18 - Facilitation Measures related to International Trade Procedures: Contains a series of recommendations regarding the simplification and harmonization of international trade procedures, including specific recommendations regarding the submission of information to governments in relation to the movement of goods. Each section describes the

[20] Please refer to http://www.unece.org/cefact/trafix/bdy_recs.htm for a full list of UN/CEFACT recommendations.

application area, outlines the procedures and documents covered, and describes the particular problems for which facilitation measures are provided.

Recommendation Number 4 - National Trade Facilitation Bodies: Emphasizes the need for a strong government-trade partnership in trade facilitation matters and recommends that Governments establish and support national trade facilitation bodies with balanced private and public sector participation in order to identify issues affecting the cost and efficiency of their country's international trade.

Trade Documents

Recommendation Number 1 - United Nations Layout Key for Trade Documents: Provides an international basis for the standardization of documents used in international trade and transport, including the visual representation of such documents. The UN Layout Key is intended particularly to serve as a basis for designing aligned series of forms employing a master document in a reprographic one-run method of document preparation; it can also be used to develop screen layouts for the visual display of computerized information.

UN/CEFACT has also developed a range of other Recommendations related to Trade Documents, such as Recommendation Number 6 - Aligned Invoice Layout Key, and Recommendation Number 22 - Layout Key for Standard Consignment Instructions.

Codes for International Trade

Recommendation Number 16: UN/LOCODE - Code for Ports and other Locations: Recommends a five-letter alphabetic code for abbreviating the names of locations of interest to international trade, such as ports, airports, inland freight terminals, and other locations where Customs clearance of goods can take place, and whose names need to be represented unambiguously in data interchange between participants in international trade. The UN/LOCODE's code list currently contains 60,000 codes for locations around the world.

UN/CEFACT has also developed a range of other recommendations related to codes for international trade transactions, such as Recommendation Number 19 - Codes for Modes of Transport; Recommendation Number 20 - Codes for Units of Measurement used in International Trade.

Recommendations for Information and Communications Technology (ICT)

Recommendation Number 25 - Use of the UN/EDIFACT Standard: Recommends coordinated action by Governments to promote UN/EDIFACT as the single international standard for electronic interchange of data (EDI) between public administrations and private companies of all economic sectors world-wide. There are currently over 200 UN/EDIFACT messages available for the exchange of data between organizations.

UN/CEFACT has also developed a range of other Recommendations related to ICT for international trade including:

• Recommendation Number 14 - Authentication of Trade Documents by means other than signature;

• Recommendation Number 26 - Commercial Use of Interchange Agreements for Electronic Data Interchange;

• Recommendation Number 31 - Electronic Commerce Agreement;

• Recommendation Number 32 - Recommendation on E-Commerce Self-Regulatory Instruments.

Trade Data Element Directory (TDED, ISO 7372) contains the standard data elements, which can be used with any method for data interchange on paper documents as well as with other means of data communication. They can be selected for transmission one by one, or used within a particular system of interchange rules, e.g. the UN/EDIFACT. The Directory provides a common language for terms used in international trade and facilitates the interchange of data. UNTDE is a component of aligned, UNLK conform trade documents. The directory has been the basis for the first UN/EDIFACT releases and will be integrated in the future UN/CEFACT core component directory. The WCO data harmonization initiative is based on TDED definitions.

Other Tools for Implementation

United Nations electronic Trade Documents (UNeDocs): is a tool based on the UN Layout Key to provide standard based trade documents in paper and electronic format. Traders and administrators can use the documents either in paper or electronic format depending of their needs. UNeDocs provide precise specification of the form layout and the data requirements. The increased precision facilitates the implementation of efficient and automated procedures. The documents facilitate the transition from paper-based information processing to electronic document exchange. UNeDocs mitigates the digital divide by providing low cost solutions for the digital documents.

Modeling: UN/CEFACT Modeling Methodology (UMM): It is often useful at the development stage of a project to develop a model of the processes involved in submitting import and export information to government. This model can be very useful in understanding the processes and information flows and will assist in the further analysis and development and automation of the project.

B. WORLD CUSTOMS ORGANIZATION (WCO)

For many years, the WCO has been making progress on the simplification and harmonization of international Customs instruments and procedures. The WCO developed and introduced the Harmonized Commodity Description and Coding System, which is used worldwide as the basis for classifying goods and for the collection of duties and taxes. The WCO is administering the WTO Valuation Agreement and developed harmonized non-preferential rules of origin under the WTO Agreement on Rules of Origin. The WCO has also revised the International Convention on the Simplification and Harmonization of Customs Procedures (the Revised Kyoto Convention).

WCO Revised Kyoto Convention: The Revised Kyoto Convention contains a binding provision for Customs to ensure that where goods must be inspected by Customs and other competent authorities that these inspections are coordinated and where possible carried out at the same time. In addition, the Convention also addresses the operation of joint controls at common border crossings, the establishment of juxtaposed customs offices and the sharing of information with other bodies.

WCO Customs Data Model: The WCO Customs Data Model is a harmonized and standardized maximum framework for data requirements for Customs and other official cross-border related purposes. The Customs Data Model supports the operation of single window systems and allows the sharing of information nationally and internationally. The Customs Data Model is based on the UNTDED, applies UN/CEFACT's Modeling Methodology (UMM) and refers to a range of UN, ISO and other international code standards such as the UN/LOCODE. The Customs Data Model contains currently message implementation guidelines only for UN/EDIFACT but will offer XML specifications in future versions.

WCO Unique Consignment Reference (UCR): The WCO UCR is a concept using ISO 15459 (ISO License Plate) compliant numbering systems or equivalent industry solutions such as

applied for example in the express carrier industry to uniquely identify consignments in international trade from origin to destination. The UCR establishes an information and documentation link between the supplier and the customer in an international trade transaction and requires this reference to be used throughout the entire supply chain. The UCR has to be linked with the transport references, where the UCR is not already serving also as the transport reference. The UCR can be used as the common access key for national and international data sharing.

C. UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT (UNCTAD)

The Automated System for Customs Data (ASYCUDA)[21]

ASYCUDA is a computerized customs management system that covers most foreign trade procedures. The system handles manifests and customs declarations, accounting procedures, and transit and suspense procedures. It generates trade data that can be used for statistical economic analysis. The ASYCUDA software is developed in Geneva by UNCTAD and operates on microcomputers in a client server environment. ASYCUDA is fully compliant with international codes and standards developed by ISO (International Organization for Standardization), WCO (World Customs Organization) and the United Nations. ASYCUDA can be configured to suit the national characteristics of individual Customs regimes, national tariffs and legislation. The system also provides for electronic data interchange (EDI) between traders and Customs using EDIFACT (Electronic Data Interchange for Administration, Commerce and Transport) rules.

The most recent Web-based version of ASYCUDA will allow Customs administrators and traders to handle most of their transactions via the Internet. The new e-Customs platform, dubbed AsycudaWorld, will be particularly useful to developing countries, where poor fixed-line telecommunications are a major problem for e-government applications. It is also powerful enough to accommodate the operational and managerial needs of Customs operations in any developed country as well. AsycudaWorld will mean even greater tax revenue collection and lower transaction costs than are already provided by the current version of the system, ASYCUDA++, making it a showcase for e-government. A secondary benefit is the provision of information to facilitate

[21] For more information on ASYCUDA, visit the web-site: www.asycuda.org

measures to combat fraud, corruption and illicit trafficking, as it gives Customs authorities in different countries a tool for working together online.

D. INTERNATIONAL MARITIME ORGANIZATION (IMO)

IMO addresses the issues related to facilitation of international maritime traffic, through its Facilitation Committee (FAL Committee). These issues include, e.g. simplification of formalities, documentary requirements and procedures on the arrival and departure of ships and harmonization of documents required by the public authorities (standardized IMO FAL Forms). Electronic business in the area of maritime traffic is one of the most important issues, which are currently under discussion in the FAL Committee. IMO has also recognized the pressing need for "a single window concept" and "pre-arrival information" to allow all the information required to be provided for and by a visiting ship to a port, including that required by the public authorities, through one point of entry. Proposed amendments to the Annex to the FAL Convention to specifically address the single window concept, together with other proposed amendments, are under consideration by the FAL Committee.

The Convention on Facilitation of International Maritime Traffic, 1965 (FAL Convention): The Convention on Facilitation of International Maritime Traffic is an international convention that has addressed:

- facilitation of international maritime traffic;
- prevention of unnecessary delays to ships, their crews, passengers and cargoes; and
- unification and simplification of formalities, documentary requirements and procedures.

Amongst others, it deals in the Annex, Section 1, C with electronic data-processing techniques for exchange of information.

The IMO Compendium on Facilitation and Electronic Business (FAL.5/Circ.15, dated 19 February 2001 and FAL.5/Circ.15/Corr.1): International guidance that has been developed for exchange of information electronically and electronic means for the clearance of ships.

E. INTERNATIONAL CHAMBER OF COMMERCE (ICC)

ICC creates rules, norms, standards and tools for international trade. Though voluntary, ICC rules carry the force of law when incorporated into contracts and countries throughout the world abide by them because they have become indispensable in facilitating and harmonizing international trade procedures and contracts across borders.

ICC/UNCTAD Rules for Multimodal Transport Documents: ICC/UNCTAD Rules set the only globally accepted standard for multimodal transport documents and frequently provide a basis for national legislation. Intended to avoid the problems that would arise for transporters from having to cope with a multiplicity of different regimes when drawing up contracts, the rules offer a uniform legal regime for private transport contracts and simplified documentation and practice.

4. The system of identification and formal descriptions of products (goods and services) for e-trade

The system of identification and formal description of products (goods and services) for electronic trade

About classification, identification and formal description of products

The products (goods and services) are the object of the electronic trade, as well as of the trade in its traditional forms. According to the international classification systems, the goods have some gradation forming a hierarchical system by their formal identification and description. The first level of this system hierarchy is taken by the commodity classes allocated by the United Nations Classification by broad economic categories (BEC), namely:

- Capital goods;
- Intermediate goods forming fixed assets of an enterprise;
- Consumption goods.

The named commodity classes are detailed at three levels by the total number of positions equal to 16. In aggregate the allocated BEC commodity classes form the initial basis of classification of goods in the basic international standard for a formal description of the economy - the System of National Accounts (SNA), developed under aegis of the United Nations. The named SNA standard introduces a classification of the kinds of products (goods and services). This United Nations classification is known as the Central Products Classification (CPC). At the regional level some

classifications of products harmonized with CPC are provided. In the European Union, this is the Classification of Products by Activity (CPA). The classifications of the kinds of products are built upon the basis of classifications of the kinds of economic activities being derived from the production process. Consequently, these classifications are applied for the statistic purposes within the scope of the macroeconomic analysis. For the statistic surveys of the production, the CPC classification is detailed to the types of the goods in some cases. In the European Union the list of PRODCOM products generated on the basis of CPA classification is used for the specified purposes.

For the trade analysis the classifications of the kinds of products are generated by a principle of generality of their consumer properties. First of all, this is the Standard International Trade Classification (SITC). SITC is harmonized with BEC being used for the trade statistic purposes. For identification of the goods and collection of customs duties, the international classification of the Custom union named as Harmonized Commodity Description and Coding System (HS) is provided. The harmonized system is detailed at the regional level. In the European Union such system is represented by the Combined Nomenclature (CN). Its semantically equivalent translation into Russian is the Documentary nomenclature of foreign trade activities (TN VED).

The third hierarchy level is formed by the types of products. At the practical level the trade works exactly with the types of commodities (goods) and with the nomenclature of commodities. The product nomenclature forms the fourth hierarchical level of the product gradation. If the product kind classifications are the structures quite stable in time (a period of updating of the product kind classifications makes 5 - 10 years), the types of products represent a set quite dynamically developing. It is necessary to add that the number of kinds of products is found within the limits of 3 - 5 thousand items (depending on a kind of classification). For example, in SITC (Rev.3) the number of classification positions constitutes 3118. The number of types of products constitutes hundreds of thousands. This is provided by the types of products containing the attribute fields reflecting their construction principles, construction features, applied materials, etc. The number of nomenclature items of the goods constitutes millions and tens millions.

Thus, it is possible to draw an essentially important conclusion: creation of the classification of types of products is impossible by acting in a traditional method. All currently known international and national classifications of products are inapplicable directly for the electronic trade organization. This conclusion is confirmed at the international level, and the available experience of creation of the product type classification with detailed elaboration to their nomenclature items in the former USSR (Classification A-OKP) has demonstrated an extremely high level of complexity, labor input and low efficiency of resolution of a similar problem.

At the same time, both the buyer and the seller should have an equal understanding what goods are sold and what goods are purchased for realization of trading operations. That is, the goods, first of all, must be unequivocally identified, and then described by the certain rules. If the transnational and remote trade is concerned, i.e. the electronic trade too, both identification of the goods and their formal description should be carried out by means of the international standards and classifications.

Let us primarily discuss what we have regarding the identification and formal description of products for the electronic trade for today. If the identification of products for electronic trade is concerned, the starting position can be considered quite satisfactory. To a greater extent, we are obliged for this to the International Electronic Commerce Code Management Association (ECCMA). Under aegis of the mentioned association and the United Nations a dictionary of names of the goods for electronic trade with their descriptions (Open Technical Dictionary ECCMA - OTD) has been created. In addition to OTD a unified list of codes of products for the electronic trade (United Nations Standard Products and Services Cord - UN SPSC) has been created. Rosettanet Technical Dictionary (RNTD) should also be mentioned as a dictionary with the international status.

For the identification purposes of the products the customs services are guided by the detailed descriptions in the Harmonized Commodity Description and Coding System **(**HS).

The issue of the formalized description of products for the electronic trade is more difficult. Initially the descriptions of products in the catalogues and the engineering specifications of the manufacturing companies demonstrate a historically developed absence of unification. At present an attempt to resolve this uneasy problem by common efforts of the International Organization for Standardization (ISO), CNCS for NATO Codification System and the Electronic Commerce Code Management Association (ECCMA) is undertaken. It is offered to transfer stage by stage the formal descriptions of supplies of the NCS system, so-called FIIG (Federal Item Identification Guide) into the ISO 13584 standards of series Plib (Parts Library). The designated problem is characterized by an exclusive complexity and, as follows from the publications known to the authors of the report, has not attained yet the area of practical actions. In our opinion, the reason for this consists in a lack of the necessary methodology of its resolution at the individuals setting this problem, and a team of competent executors in a wide spectrum of the subject domains of the knowledge.

We propose a variant of resolution of the problem of identification and formal description of the products based on the available experience of works under the designated problem in Russia. In our opinion, a solution of this problem should be found in the form of the System of identification and

formal description of products (goods and services) for the electronic trade (further named in the text as the System).

Initial principles of the System creation

- The System should integrate the available international and national experience, the regulatory documents (normative technical and normative legal) and the historically developed practice in the field of standardization and cataloguing of products, the international and national trade, and also the achievements of the information technologies;
- The System should cover the nomenclature of products involved in the electronic trade;
- The System should be built as an open system providing its stage-by-stage development by escalating of the volume of kinds and types of products covered by it with preservation of the initially created organizational structure;
- The System should provide simplicity and transparency of dialogue of the sellers and the buyers, and also the greatest possible choice of variants of finding of the goods for bargains for the clients of the System;
- The organizational structure and the functioning algorithm of the System should be fixed by the international standards under aegis of the United Nations;
- Realization of the System is supposed in the form of a spatially distributed structure on the basis of the modern information technologies within the Internet. The fragments of the System under the offered uniform methodology can be created in the form of the national systems, and also for large companies and holdings with maintenance of their information compatibility without use of file converting for the dialogue between the trade platforms.

Organizational structure of the System

In order to cover the nomenclature of the products involved in the electronic trade, it is necessary to begin with the commodity classes forming the top level of the hierarchy. Thus, as has been stated above, we have three sets of goods: capital goods; intermediate goods; consumption goods.

Thus, the unified formalized description of production suitable for application in the transnational trade is possible only on the basis of the acting international standards and classifications. In turn, as known, the objects of standardization are the groups of homogeneous (by the allocated attributes) products rather than some individual kinds of the products. For this reason, the initial stage of establishment of the System is represented by separation of a hierarchical system of groups of homogeneous production (HPG) in three allocated sets of products. Such separation, in no way arbitrary, should be based upon the acting system of standardization of products and the practice

historically developed at the international level of formation of homogeneous sets of products. Finally, the allocated HPG nomenclature should be recognized by the world community by the international standardization this result under aegis of the United Nations.

The approaches to formation of HPG in three allocated sets of the goods at the level of their categories are inherent in each of their features. The goods of intermediate consumption are some "construction material" for the production process as a whole, including: raw material, constructional materials, substances, fuel and lubricants completing elements and unified components of the equipment, equipment and tools built in into the equipment or metrological means as integral parts, working clothes and footwear. For the products of industrial purpose the initial basis for formation of the HPG system are the industrial complexes operating in the economy. Their provisional list is provided below:

- Fuel, energy and raw
- Mining, except for fuel and energy
- Agricultural industry
- Timber industry
- Fishing
- Production of food articles
- Production of fabrics, clothes and footwear (former "light industry")
- Petrochemical
- Pharmacy
- Metallurgical
- General machine building (production of production assets)
- Production of electric technological equipment
- Instrument making
- Production of computer facilities, office equipment and telecommunication equipment
- Production of furniture and interior articles for inhabited and public premises
- Building industry
- Production complex of ground transport means
- Aviation industry

- Ship building
- Electric power industry, production of thermal energy, distribution of water and gas
- Nature protection, including all cycle of industrial waste processing
- Trade
- Municipal services
- Defense industry.

For a set of products forming the consumer goods, the initial basis for formation of HPG system are the groupings developed in practice: food stuffs, clothes, footwear, sport goods, furniture, accessories for premises, electric household appliances, etc. We shall result a provisional list of the HPG top hierarchy level for completing items and unified components of the equipment below.

- Fixing items
- Unified mechanical components of the equipment (flanges, latches, covers, reducers, pumps, etc.)
- Bearings
- Electric wires and cables
- Electric motors and electric generators (other than power generators)
- Electric demountable connectors and mechanical switches
- Electromagnetic relays, actuators, step selectors, and other electromagnetic units of control systems
- Insulators and isolating materials
- Boards for radio electronic equipment
- Discrete items of radio electronic equipment (resistors, condensers, transformers, throttles, diodes, transistors and other discrete items of radio electronic equipment)
- Lighting and display devices with cartridges and holders
- Screen information display equipment
- Units and elements of hydraulic systems
- Units and elements of pneumatic systems
- Microwave devices and systems

- Integrated circuits, microprocessors and piezoelectric devices
- Fiber-optical wires, cables, devices and systems
- Manual tools and consumables for metal and timber processing

Each of HPG resulted in the list has detailing groupings of the bottom level. For example, fixing items are divided into HPG of the bottom level as follows:

- Thread connections (bolts and nuts)
- Screws
- Riveting connections (rivets)
- Nails
- Buttons.

In turn, each of the allocated bottom level HPG is divided into the types of products[22]. For example, nails are divided into the following types: building nails, furniture-upholstering nails, nails for special works. We shall result one of the lists of top hierarchy level HPG for the unified components of the equipment «Standalone power supply sources»:

Standalone power supply sources: stationary, transported, man packs, portable (the first level of the hierarchy).

Stationary standalone power supply sources are divided into thermal, hydropower, wind, geothermal, tidal, chemical current sources, solar batteries, etc. (the second level of the hierarchy).

Transported, man packs and portable sources of standalone power supply are divided into mobile power stations with petrol and diesel internal combustion engines, electric power sources on solar batteries, chemical current sources, electric power sources on fuel elements (electric chemical generators within the scope of the hydrogen power), radioisotope electric power sources, etc. (the second level of the hierarchy).

Further, for example, the current chemical sources are divided into accumulators, primary elements and current sources of reserve type (the third level of the hierarchy). For the current sources of reserve type there is also a gradation: thermal batteries, vial batteries and water-activated batteries (the fourth level of the hierarchy).

[22] A set of kinds of products.

On the next level of the hierarchy the types of products are formed. For example, starting storage batteries for vehicles, traction batteries for on-site vehicles, batteries of primary elements for radio-electronic equipment, etc.

Each allocated HPG is associated with the explanatory dictionaries (OTD ECCMA, RN TD and others if necessary) and the kinds of products forming the groups according to the acting international classifications (CPC, CPA, HS/CN, UN SPSC, etc.) with the names and codes of positions. HPG names are the identifying attributes of products included into them. Each HPG entered into the System is appropriated an alphanumeric code under the certain rules. As has been noted above, each HPG is the basis for formation of a group of the types interconnected with it. In turn each type has own name and a code generated as an addition of the base HPG code categories. Further for each of types the attribute fields are formed which are fixed in the form of a facet set in the nomenclature type code. Thus, we attain the product coding type in the form of an alphanumeric code of the hierarchically facet classification. However, no traditionally understood classification is generated. Instead of it we set a unified algorithm of description and coding of the types of products.

The types of products represent themselves as a basis for formation of catalogues and nomenclature directories of products. The catalogues and directories are formed as the sets of catalogue sheets.

The catalogue sheets also include the complete list of the data necessary for the trade platform clients at the bottom hierarchy level of the formal description of products. This includes the following: the complete standardized name of the product, the product type code from the type, the index of the product appropriated by the manufacturer, the list of the basic consumer parameters, the reference to the specifications and access address, the references to certificates or declarations of conformity of the product to the specified values of parameters, the cost of product and the term of delivery, the contact information of the manufacturer and the supplier of the product.

The following conclusions and suggestions should be made as a conclusion of the given section:

- Realization of the proposed System with the normative maintenance under aegis of the United Nations will allow a stage creation of the world trade platform distributed among the regions and the holders of information resources regarding dialogue of sellers and buyers, acting according ot the functioning algorithms uniform for the world community;
- Russia is ready:
    - To develop the methodology and the functioning algorithm of the world trade platform on the basis of the offered System with fixing the attained results in draft versions of the international standards under aegis of the United Nations;

- To develop the HPG system and on its basis the sets of types for intermediate consumption products[23]. The experience of similar work and a team of competent experts in the corresponding subject domains are available in Russia.

[23] Te most capacious part of nomenclature positions which may be engaged in e-trade. In common the number of such positions makers tens millions.