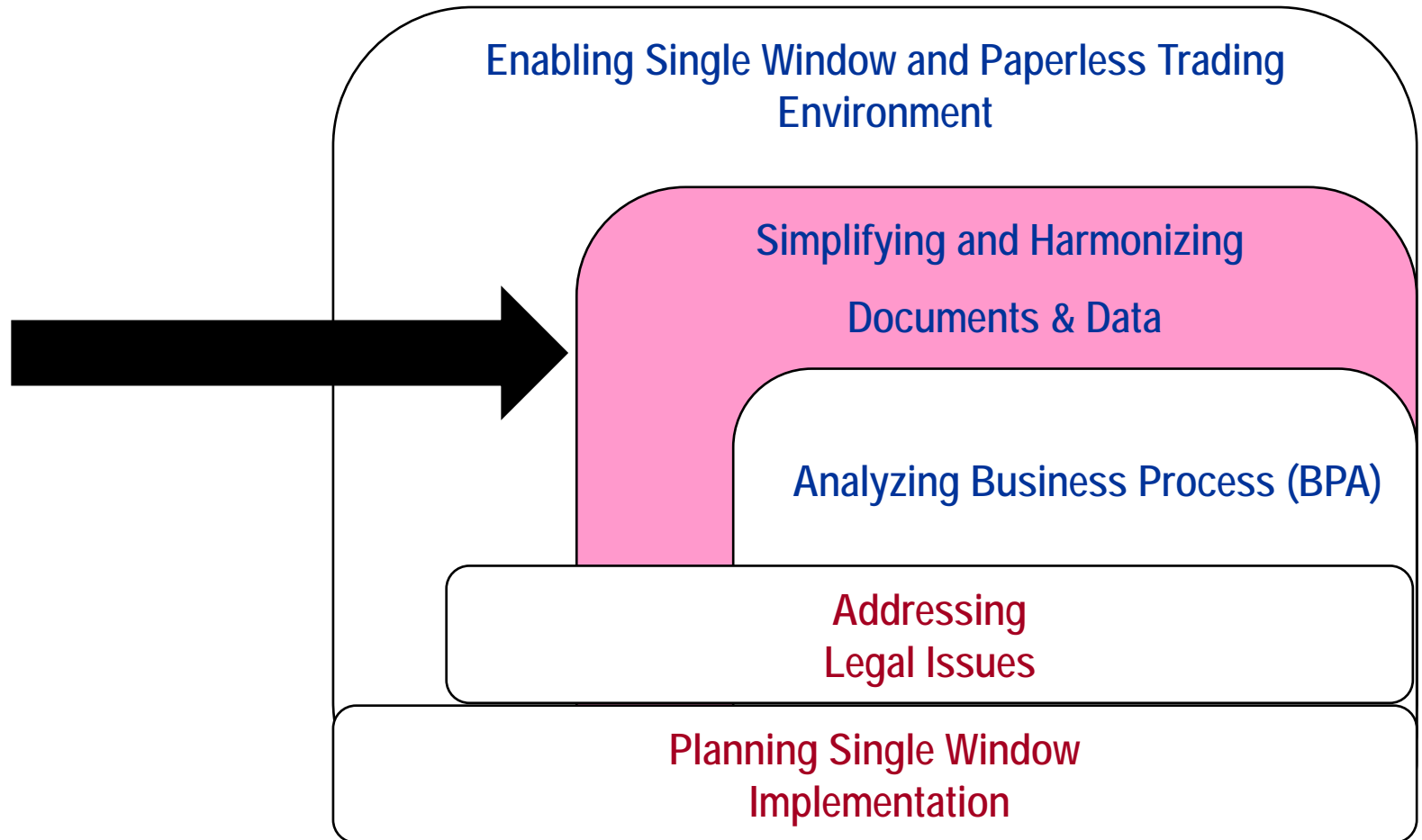


# Introduction to Data Harmonization and Modelling

**15 October 2013**  
**Customs Border Control Training Center**  
**Cheon-an, Republic of Korea**

**Sangwon Lim**  
**Trade and Investment Division**  
**United Nations ESCAP**

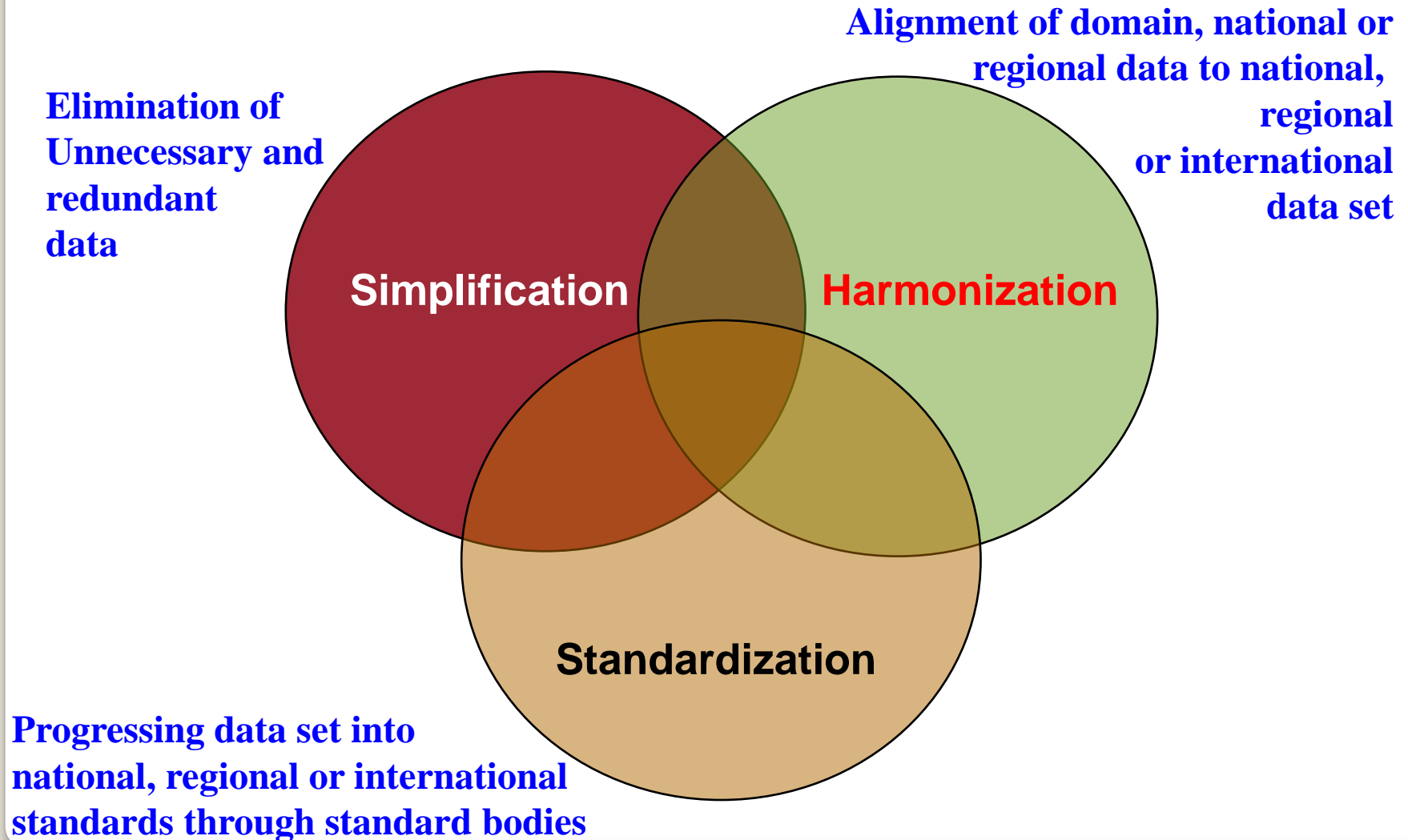
# Data Harmonization and Modeling: Where does it fit in SW implementation?



# Data Harmonization and Trade Facilitation

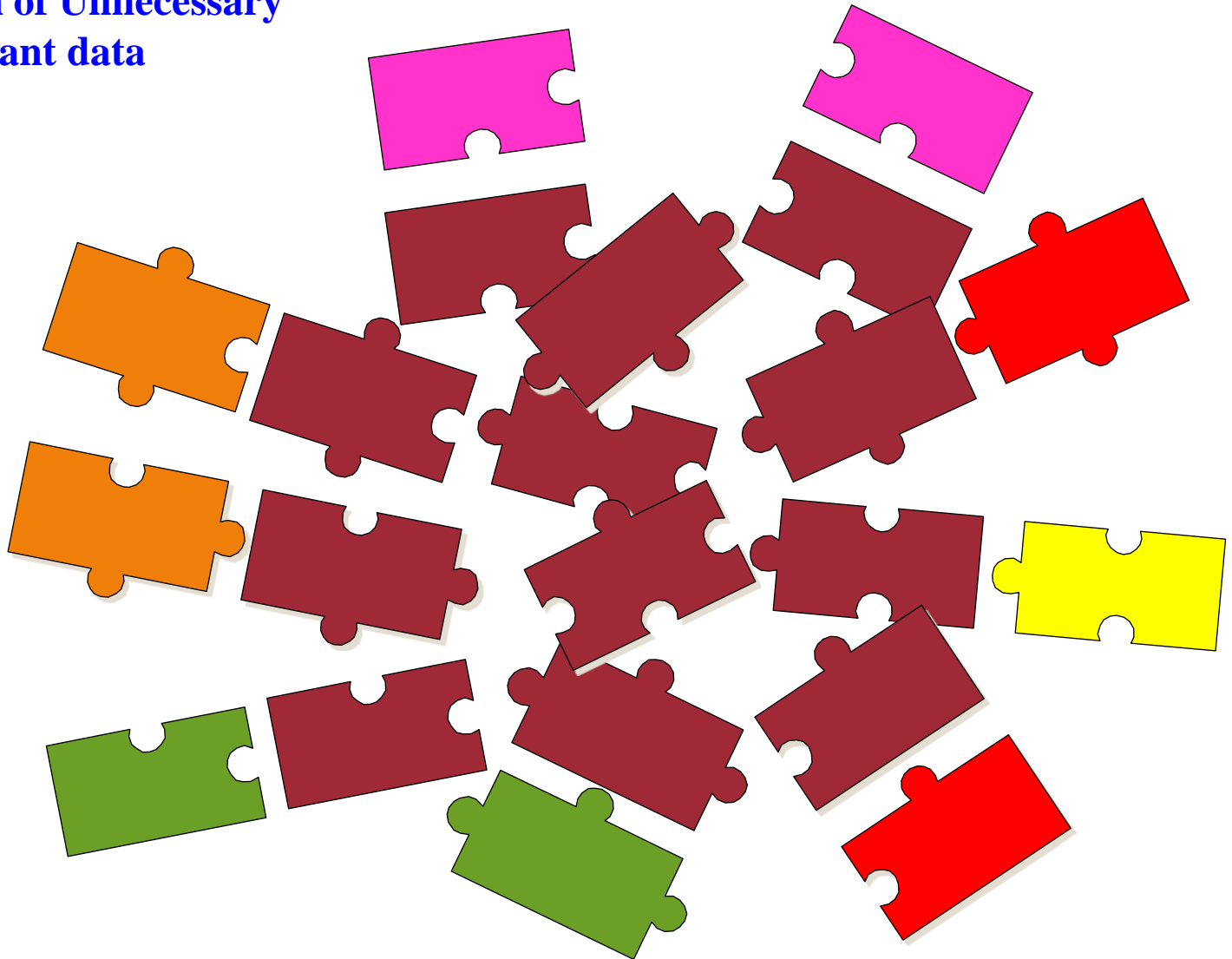
Trade Facilitation	APEC (Woo and Wilson, 2000)	OECD (OECD, 2002)	UNECE (UNECE, 2002; OECD, 2002)	WB (World Bank, 2005)	WTO (WTO Website, 2005; OECD 2002)
The simplification and harmonization of trade Procedures	✓	✓	✓	✓	✓
The harmonization and standardization of information and information flows associated with the international trade transaction		✓	✓	✓	✓
The use, standardization, and improvement of physical infrastructure and facilities	✓		✓	✓	
The harmonization of applicable laws and regulations with the international standards			✓	✓	
The automation of trade Procedures	✓			✓	
The removal of barriers to the mobility of business people	✓				

# Data Simplification, Harmonization and Standardization



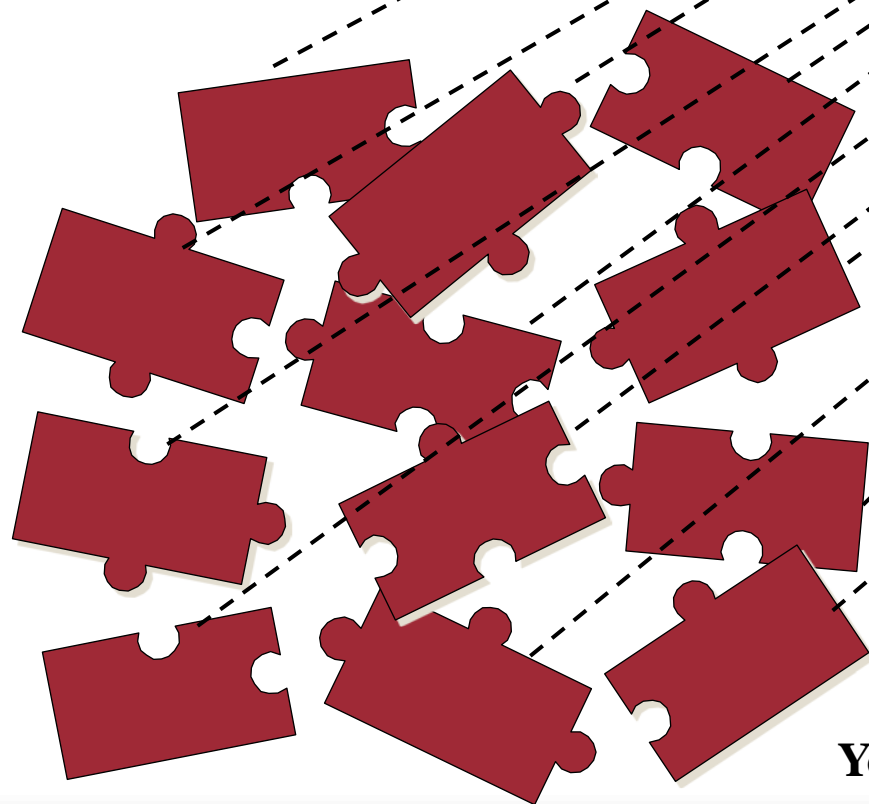
# Data Simplification

Elimination of Unnecessary  
and redundant data



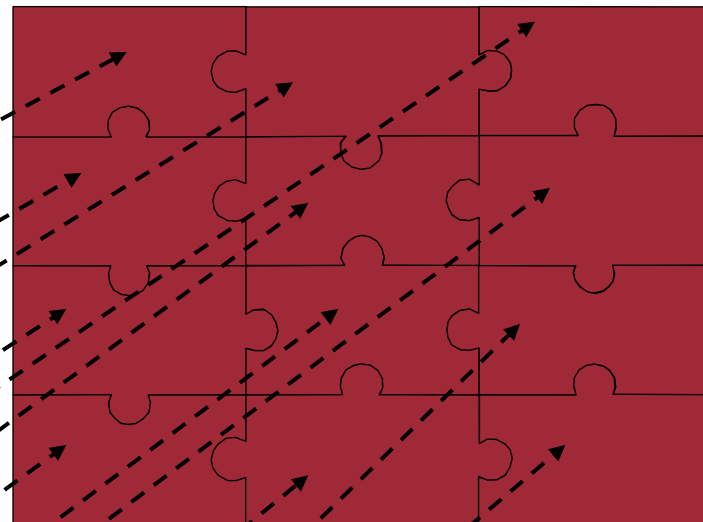
# Data Harmonization

Alignment of domain, national or regional data to national, regional or international data set



**Your Data Set**

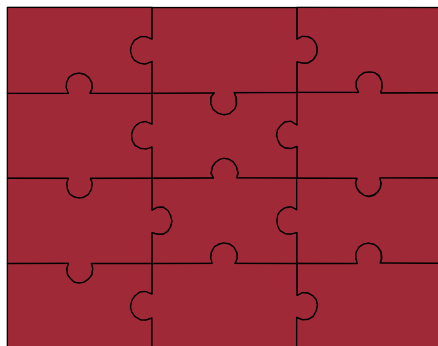
**Nat'l/Regional/Int'l Data Set**



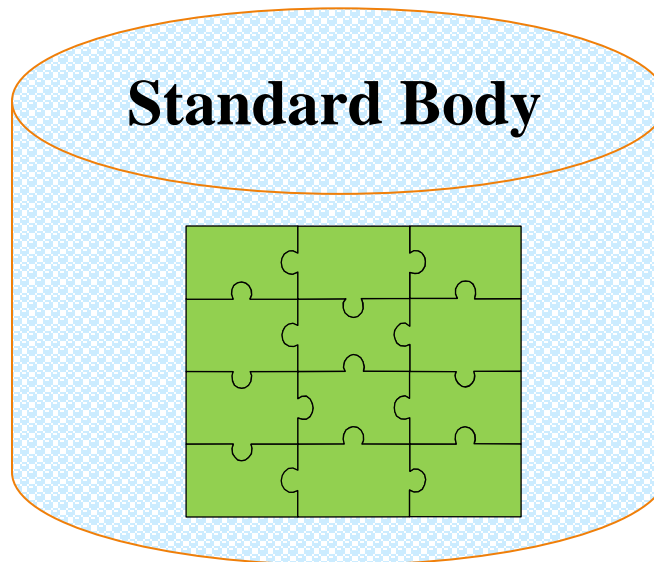
# Data Standardization

Progressing data set into national, regional or international standards through standard bodies

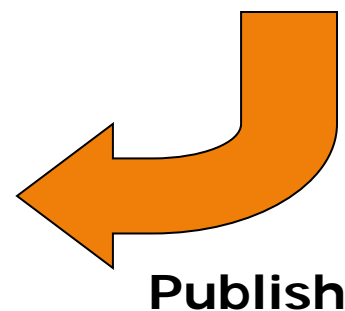
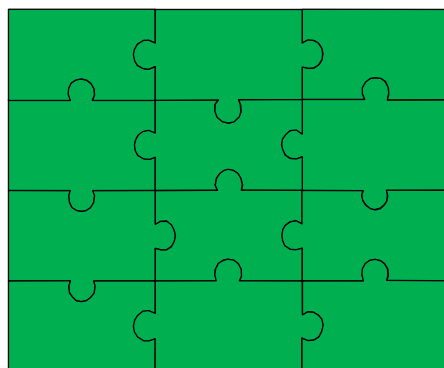
**Harmonized Data**



**Standard Body**



**Nat'l/Regional/Int'l  
Standards**



# From Paper..to paperless Trade

- Trade using paper documents is based on human to human interaction
- Common understanding of
  - who does what and how
  - What information means
  - ..and how it is interpreted
- Communication between computers requires precise definitions of
  - The processes (who, what, how, when, why)
  - the meaning of data (semantic)
  - ..and the structure of the data (Syntax)

# Example: Name of a Person in a Form

Person Name

TDED 3404 Person name  
*Family name and given names of an individual.*

- 
- Nickull, Duane A.
  - Mr. Nickull
  - Duane Nickull
  - D. A. Nickull
  - Duane A. Nickull
  - Duane Allan Nickull
  - Nickull, Duane Allan
  - Mr. D. Nickull
  - Monsieur D.A. Nickull
  - ...

# Mini Exercise

Task:

- What is a 'delivery date'?
- Is it always a date?
- How many different types of delivery dates can you think of?

<b>Meaning</b>	<p>➤ <b>Buyer:</b> Date and optionally time when goods are <i>requested</i> to be delivered</p> <p>➤ <b>Seller:</b> Date and optionally time when goods are <i>estimated</i> to be delivered</p> <p>➤ <b>Driver:</b> date and period of time during which goods are <i>scheduled</i> to be delivered</p>
<b>Format</b>	<p>✓ <input type="checkbox"/> DD/MM/YY: 20/08/10</p> <p>✓ <input type="checkbox"/> DD/MM/YY (Buddhist year): 20/08/53</p> <p>✓ <input type="checkbox"/> DD-MM-YYYY: 20-08-2010</p> <p>✓ <input type="checkbox"/> MM/DD/YY: 08/20/10</p> <p>✓ <input type="checkbox"/> MM-DD-YYYY: 08-20-2010</p> <p>✓ <input type="checkbox"/> YYMMDD: 100820</p> <p>✓ <input type="checkbox"/> YYYYMMDD: 20100820</p> <p>✓ <input type="checkbox"/> YYYY-MM-DD: 2010-08-20</p> <p>✓ <input type="checkbox"/> DD MONTH YYYY: 20 August 2010</p> <p>✓ <input type="checkbox"/> MONTH DD, YYYY: August 20, 2010</p>

# Paperless Trade: The issues

The migration from paper to paperless trade requires

- Structured, detailed analysis of business processes and data
- Joint understanding of processes and data
- Simplification of processes and data
- Automation of processes and data

Benefits from AUTOMATION and SIMPLIFICATION

# Data Harmonization Defined

## Definition

An act of reconciling the **definition (semantic)** and **representation formats (syntax)** of data elements in a domain of interest. It entails a set of activities that improves the consistency in the use of data elements in terms of their meaning and representation format.

Data harmonization will identify a set of core data elements (data elements expressed using different descriptions but with identical meaning)

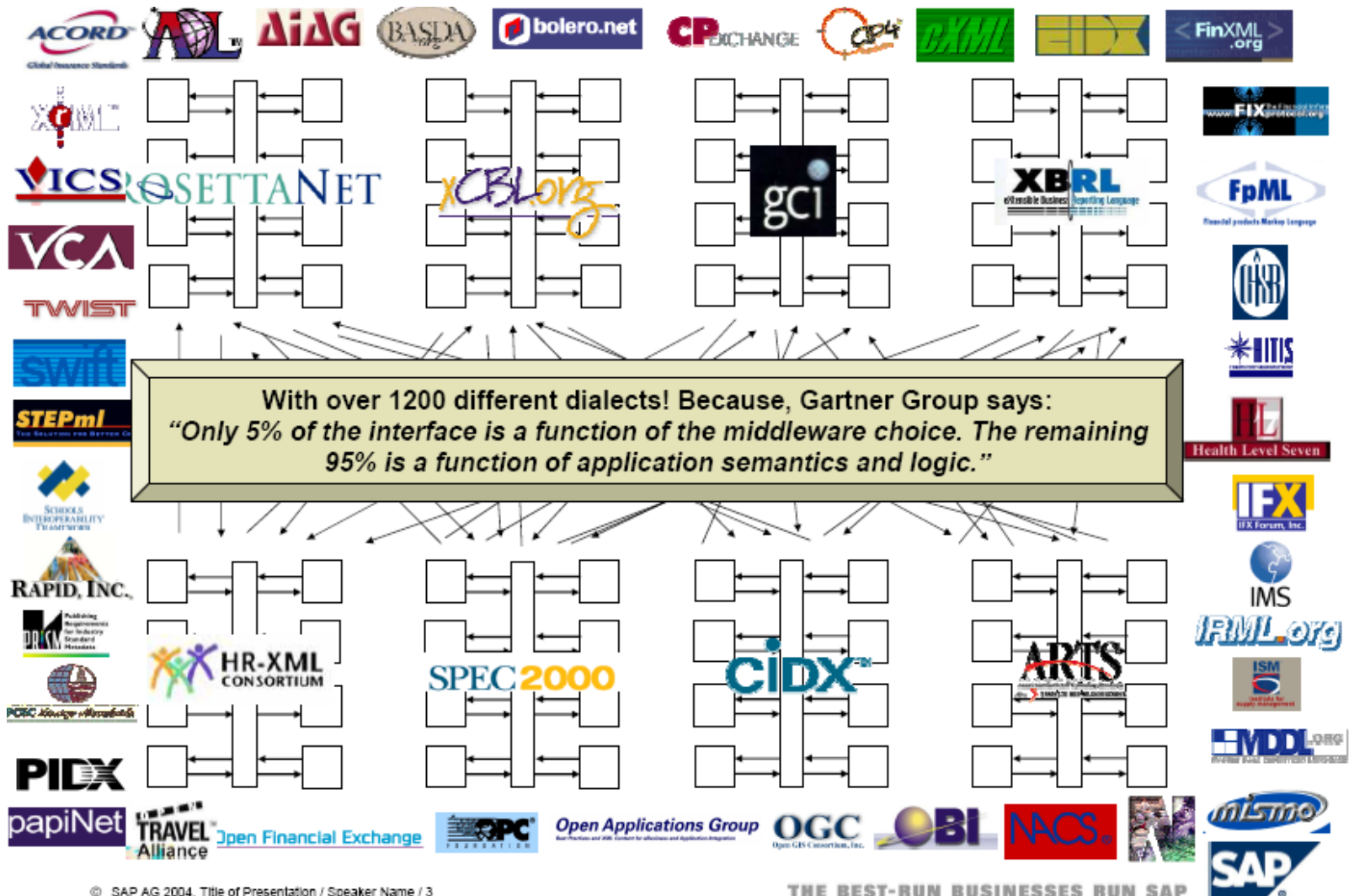
	Definition \ Source	Certificate of Product Standards	Phytosanitary Certificate	Certificate of Origin
Core Data Element 1 {	The first point of arrival in the country of final destination*	Place of destination	Declared point of entry	Destination (Place)
Core Data Element 2 {	Free form description of the marks and numbers on a transport unit or package**	Shipping mark	Distinguishing mark	Mark

\* International Standards for Phytosanitary Measures, Guidelines for Phytosanitary Certificates (Publication No. 12)

\*\* UN/CEFACT Export Certification (eCert) RSM

# Why Data Harmonization?

## Lack of Semantic Interoperability

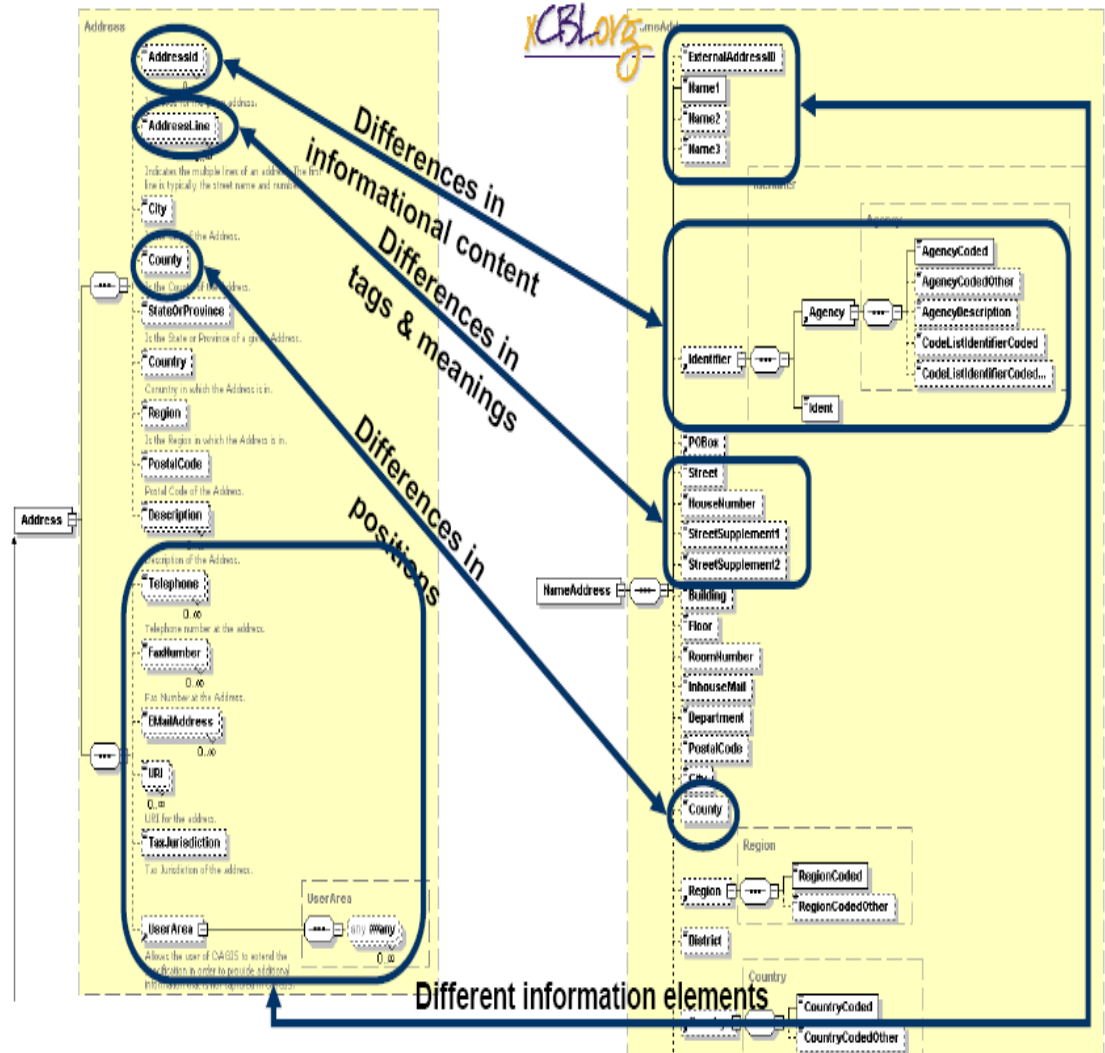


# Why Data Harmonization?

## Problems in Data Interoperability

### Various representation formats of data

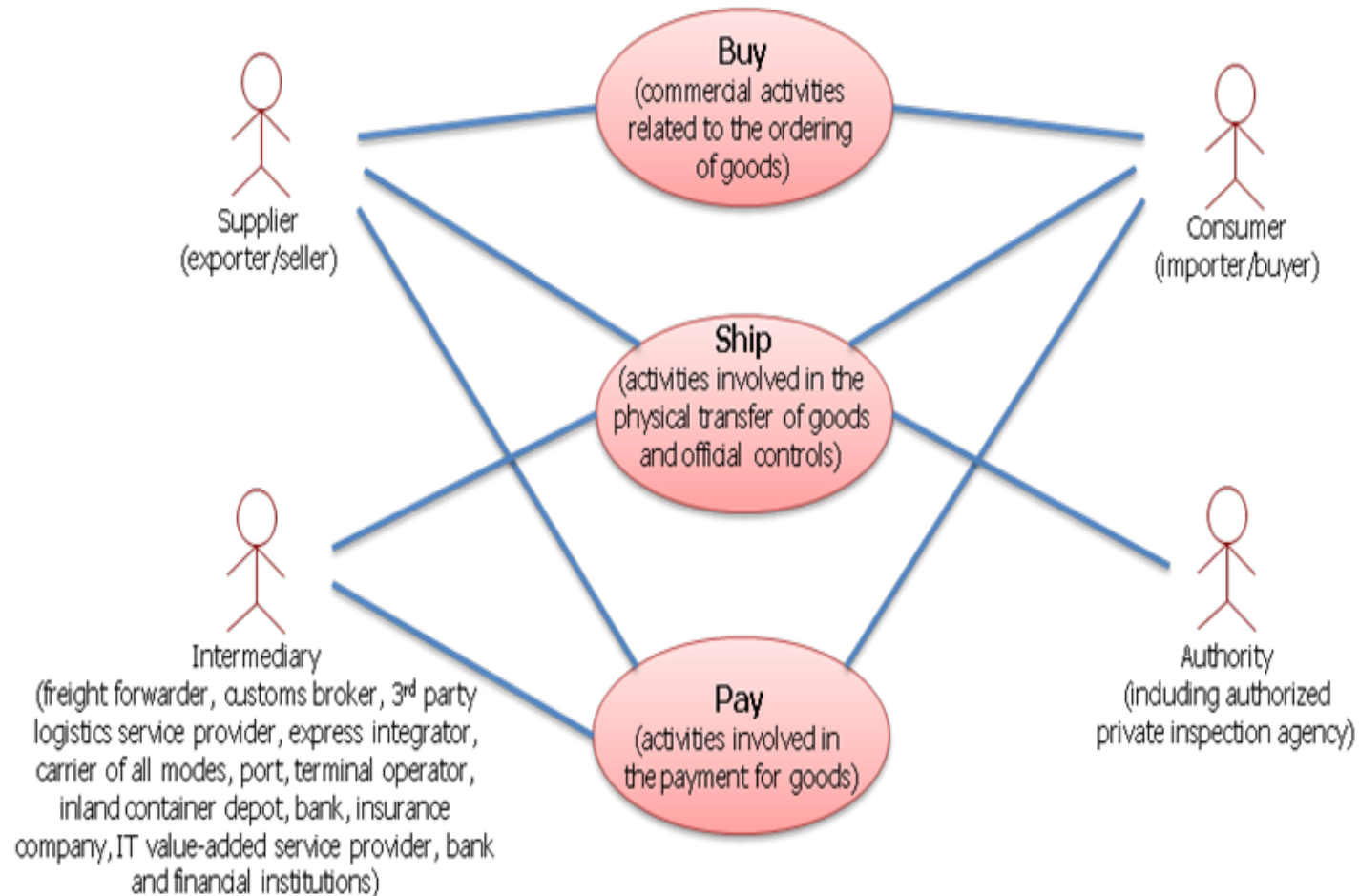
- DD/MM/YY  
20/08/10
- DD/MM/YY (Buddhist year)  
20/08/53
- DD-MM-YYYY  
20-08-2010
- MM/DD/YY  
08/20/10
- MM-DD-YYYY  
08-20-2010
- YYMMDD  
100820
- YYYYMMDD  
20100820
- YYYY-MM-DD  
2010-08-20
- DD MONTH YYYY  
20 August 2010
- MONTH DD, YYYY  
August 20, 2010



# Objective and Goal of Data Harmonization

- The objective of data harmonization:
  - to eliminate redundancies and duplication in the submission of international trade data
- The ultimate goal:
  - A set of core data elements harmonized with a semantic standard
  - .. that can be used to develop electronic equivalents of paper documents
  - .. for data interoperability among individual information systems in the supply chain

# Scope of Data Harmonization



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

# Outputs of Data Harmonization

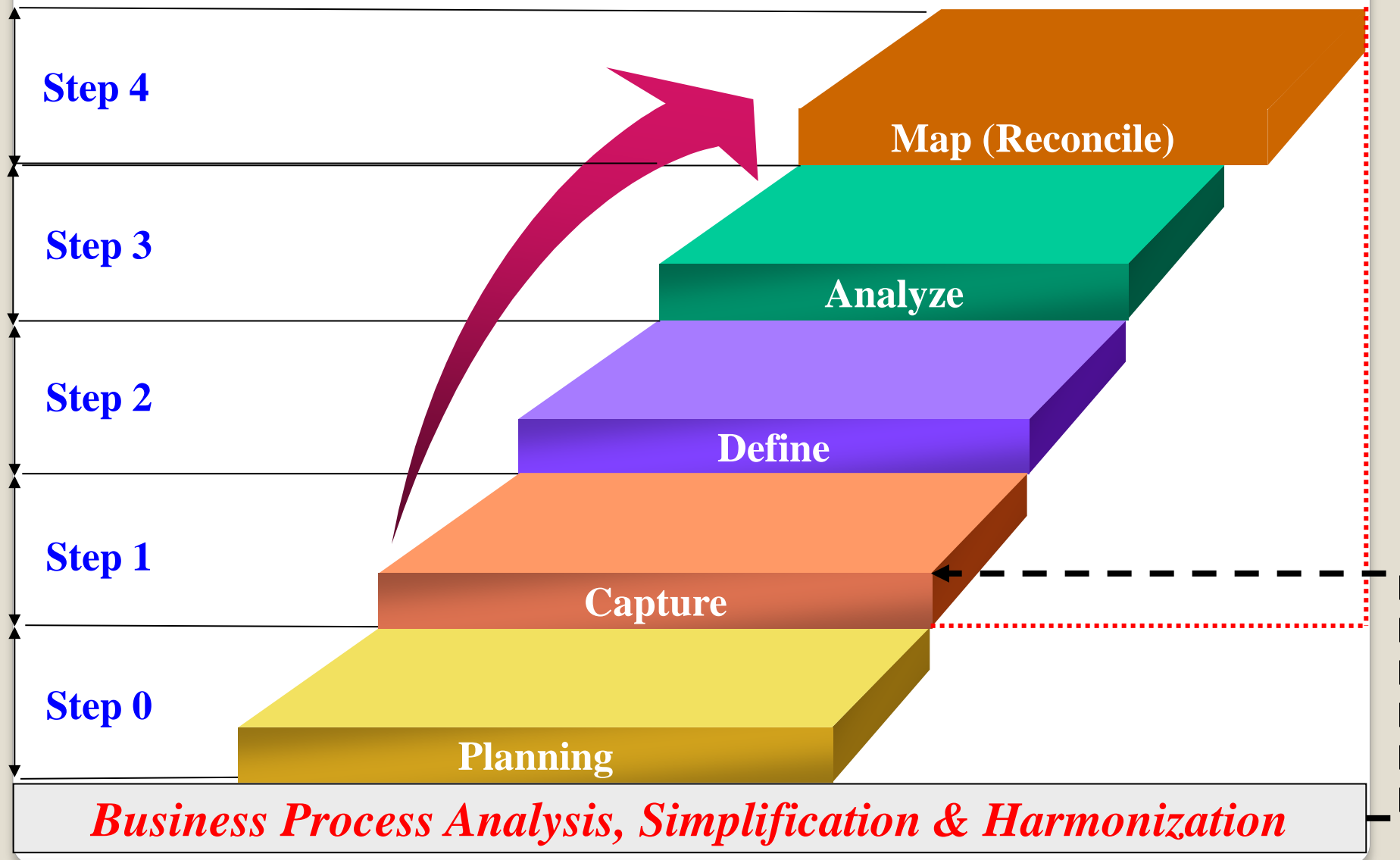
- ◆ A list of documents and electronic documents or messages that fall into the scope of the data harmonization project
- ◆ A set of Data Dictionaries that corresponds to the identified list of documents and electronic documents or messages
- ◆ National Standard Data Set that 1) consolidates data requirements listed in each Data Dictionary and 2) contains standard semantic definition and representation format for each data requirement
- ◆ A set of Message Implementation Guidelines for key documents that supports both UN/EDIFACT and XML messaging syntaxes

# Benefits of Data Harmonization

The data harmonization and its outputs...

- provide *common semantic standards* for import, export and logistics information
- *decrease data redundancy and duplication*
- ensure *data compatibility* and enable *data interoperability* among stakeholders, resulting in further facilitation of trade procedures
- preparation to develop electronic trade documents
- support the *establishment of Single Window facilities: a single entry point of standardized information and reuse of information* to fulfill all import, export and transit related regulatory requirements

# How to Do Data Harmonization Stepwise?



# In Summary

- Harmonization of data used in trade documents and their alignment with international standards would **help to automate and streamline trade procedures.**
- Streamlined trade procedures and documents could help in **time and cost savings** resulting in improvement in trade and competitiveness.
- Data harmonization is an essential step for development of a system for electronic data sharing and exchange.
- In the context of trade facilitation, the scope of data harmonization **covers data requirements of all stakeholders** in the international supply chain.
- The outputs of data harmonization provide **one standard data set** for further development of an individual system that **helps ensure data exchange and interoperability** at the semantic level.

# Group Discussions

**Thank you**