

Addressing Technical Issues for Paperless Trading and SW Implementation



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Paperless Trade and Single Window**
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Speaker - Dr. Somnuk Keretho



Somnuk Keretho is an assistant professor of Computer Engineering Department, and the founding Director of Institute for IT Innovation (INOVA), a research and development institute of Kasetsart University, Thailand, specializing in ICT-enabled innovation, trade facilitation and e-logistics initiatives including Single Window strategic planning and implementation, enterprise information architecture for e-government and e-business, business process analysis and improvement, data harmonization and modeling, ICT-related standards and interoperability, e-transaction related laws, and process-oriented quality software engineering.

He has led several ICT strategic projects at organizational, national and regional levels. For the past seven years, he has assisted Ministry of Information and Communication Technology, National Economic and Social Development Board, Ministry of Transport, Port Authority of Thailand, and Ministry of Agriculture in architecting “Thailand Single-Window e-Logistics” related projects including its national e-logistics strategy, implementation plans, interoperability and standards, harmonization and simplification of trade and transport-related documents and procedures, automatic electronic-gate systems development for the Bangkok Port and the Leamchabang Sea Port, and several related software development projects.

Several of those projects are being aligned with regional and international collaborations, in which Dr. Keretho has actively engaged mostly related to trade facilitation, single window and paperless trading initiatives through UNESCAP, UNECE, APEC and ASEAN. He has played several roles in catalyzing the creation of and actively contributing to the United Nations Network of Experts for Paperless Trade in Asia and the Pacific (www.unescap.org/unnext), and providing several technical supports to the APEC Paperless Trading and ASEAN Single Window Initiatives. He is the main author of the UNNExT Business Process Analysis Guide, the UNNExT Data Harmonization Guide and the UNNExT Managerial Guide for Single Window Planning and Implementation.

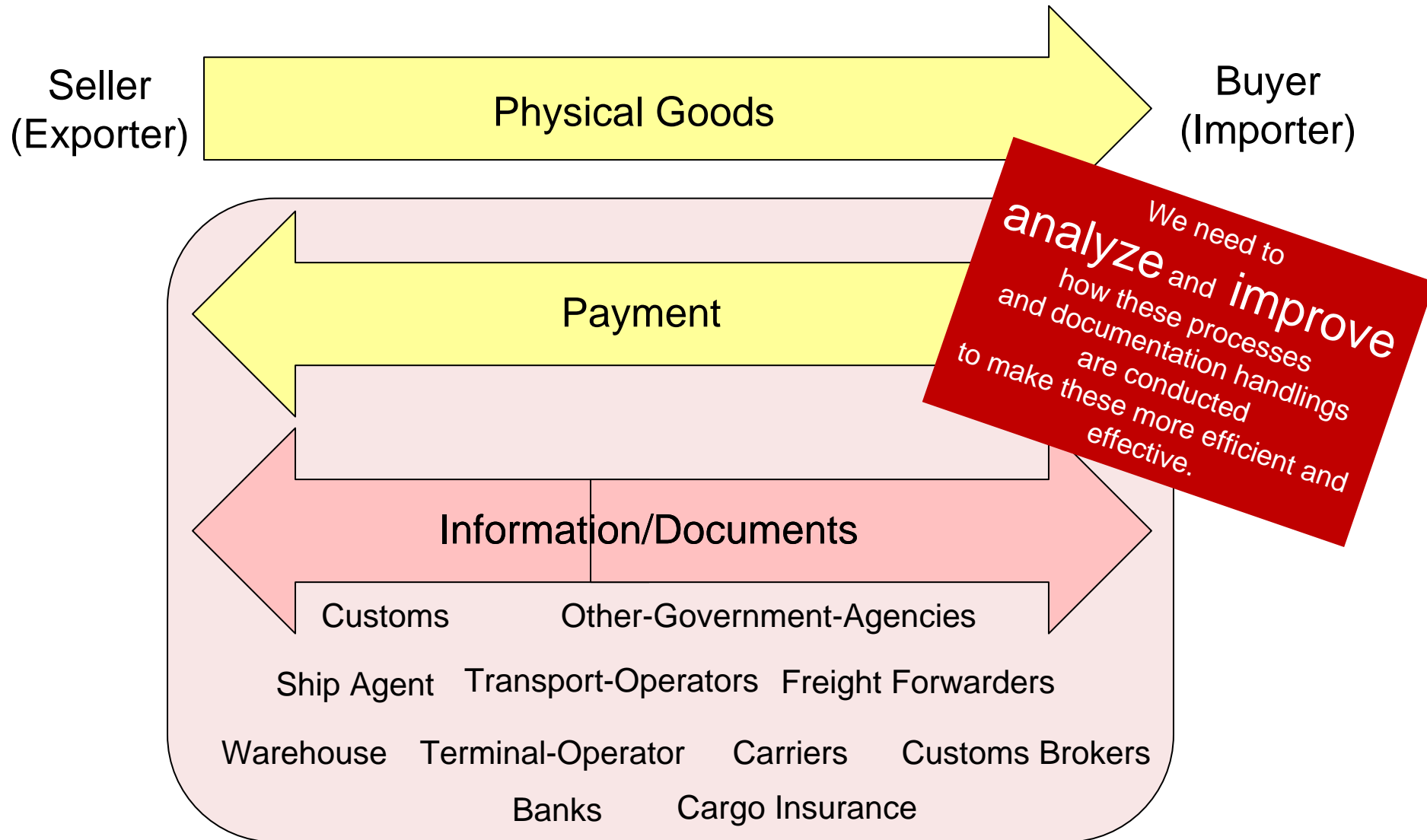


Topics of this presentation

To introduce technical issues (**what are they, and why they are important**) related to SW Implementation

- Process Analysis and Process Improvement
- Data Harmonization & Document Simplification
- e-Message Development
- System Interface & Interoperability
- Online Security
- Use of Technical Standards
-

Trade Logistics – 3 Kinds of Flow



Documents related to Exportation of Rice

(from purchase order until the cargo container leaving the sea port)

36 Documents involving 15 parties, and more than 1,140 data elements to be filled in

Buy/Pay Docs

1. Proforma Invoice (35)
2. Purchase Order (39)
3. Commercial Invoice (51)
4. Application for Letter of Credit (24)
5. Letter of Credit (32)
6. Packing List (25)
7. Cargo Insurance Application Form (20)
8. Cover Note (23)
9. Insurance Policy (24)
10. Booking Request Form – Border Crossing (25)
11. Booking Confirmation – Border Crossing (30)
12. Booking Request Form – Inland Transport (16)
13. Booking Confirmation – Inland Transport (18)
14. Bill of Lading (42)
15. Empty Container Movement Request (TKT 305) (20)
16. Request for Port Entry (TKT 308.2) (27)
17. Equipment Interchange Report (EIR) (24)
- 18. Container Loading List (28)**
19. Container List Message (32)
20. Outward Container List (34)

Transport Docs

21. Master Sea Cargo Manifest(17)
22. House Sea Cargo Manifest (37)

Regulatory Docs

- 23. Export Declaration (114)**
- 24. Good Transition Control List (27)**
- 25. Application for Permission to Export Rice (KP. 2) (24)**
26. Sales Report (KP 3) (21)
- 27. Application for the Collection of the Permit for the Export of Rice (A. 3) (35)**
- 28. Permit for the Export of Rice (A. 4) (35)**
- 29. Application for Certificate of Standards of Product (MS. 13/1) (44)**
- 30. Certificate of Analysis (17)**
- 31. Certificate of Product Standards (MS. 24/1) (45)**
- 32. Certificate of Fumigation (21)**
- 33. Application for Phytosanitary Certificate (PQ. 9) (29)**
- 34. Phytosanitary Certificate (33)**
- 35. Application for Certificate of Origin (42)**
- 36. Certificate of Origin (38)**

* Number in parenthesis is the no. of data elements

Conduct Business Process Analysis

- Exporting Jasmine Rice from Thailand -

BUSINESS PROCESS ANALYSIS

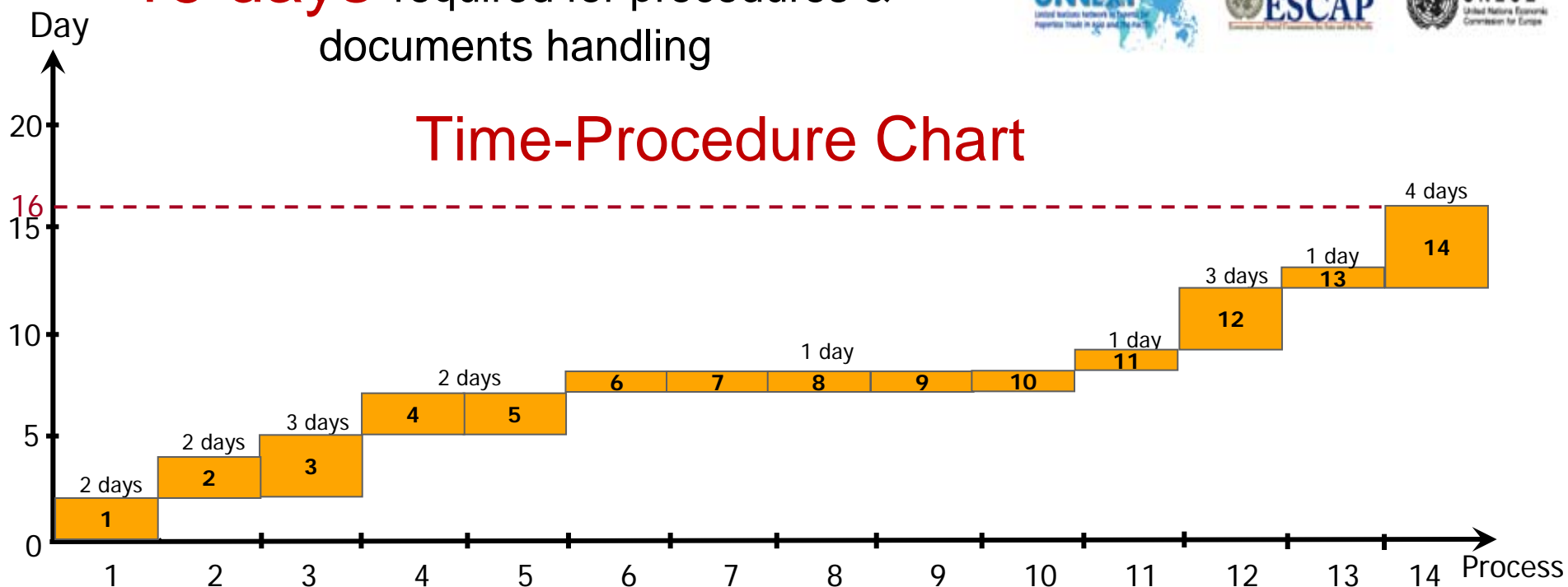
GUIDE

TO SIMPLIFY TRADE PROCEDURES



16 days required for procedures & documents handling

Time-Procedure Chart



1. Buy - Conclude sales contract and trade terms
2. Obtain export permit
3. Arrange transport
4. Arrange the inspection and fumigation
5. Obtain cargo insurance
6. Provide customs declaration
7. Collect empty container(s) from yard

8. Stuff container(s)
9. Transfer to port of departure
10. Clear goods through customs
11. Handle container at terminal and stow on vessel
12. Prepare documents required by importer
13. Verify the accuracy/authenticity of exported cargo
14. Pay - Claim payment of goods

Exporting Rice

(from purchasing time till the vessel leaving the port)

- 36 required documents (only 4-6 e-documents)
- 15 Stakeholders involved
- 14 big steps (123 small steps)
- 16 days needed (all together)
 - 6 days for **regulatory** procedures
 - 7 days for **transport-related** procedures
 - 12 days for **traders, banks** and **insurance** procedures



The issue is about

Increasing National Trade Competitiveness

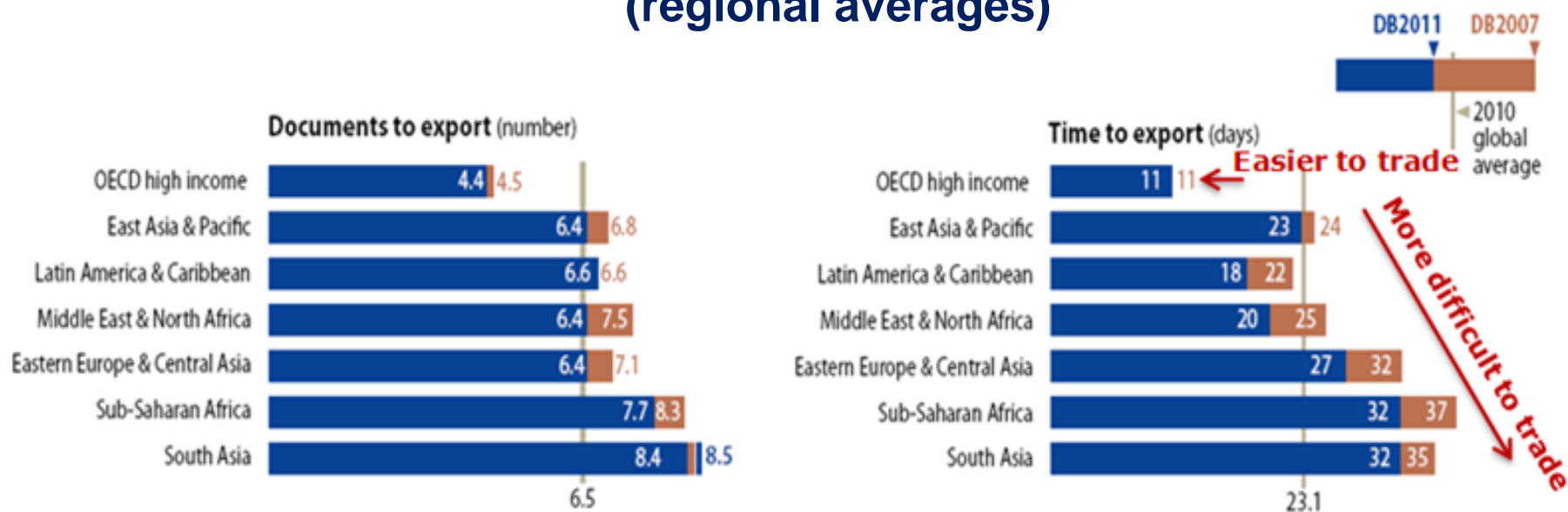
by improving
Import-Export/Transit **Procedures and Documents Handlings**
among Government Agencies,
Business Entities and
Logistics/Transport Service Providers

This is called **“Trade Facilitation”** improvement
(the third flow of logistics)

(This is now the key national development agenda of most countries around the world.)

Some countries are easier & faster to trade, but some countries are more difficult to trade with.

Complications in terms of required documents and procedures, and time for exporting a standardized container of goods (regional averages)



**As an example,
the average time to export from OECD high-income Countries
is about 2 times faster than the Middle East Countries,
about 3 time faster than Central Asia Countries (on average).**

Economic Impacts

because of the delay on trading across borders

- Each *additional day of delay* (e.g. because of trade logistics procedures) *reduces trade* by at least *1%*

Ref: “**Trading on Time**,” Simeon Djankov, Caroline Freund, and Cong S. Pham, World Bank (2007).

- “**Direct and Indirect Cost** from import/export-related procedures and required documents is about *1-15% of product cost.*”

Ref: “**Quantitative Assessment of the Benefits of Trade Facilitation**,” OECD (2003).

Business Process Analysis (BPA) must be conducted during the analysis of any SW project.

Indicators can help decision makers to understand the importance of efficient business processes for improving national competitiveness

| Indicator | Kazakhstan | Iran, Islamic Rep | Turkey | Thailand |
|-------------------------------------|------------|-------------------|--------|----------|
| Documents to export (number) | 9 | 7 | 7 | 5 |
| Time to export (days) | 76 | 25 | 14 | 14 |
| Cost to export (US\$ per container) | 3130 | 1275 | 990 | 625 |

Trading-Across-Border Ranking among 183 countries

Reference - World Bank's Doing Business 2012 Report - Trading Across Border www.doingbusiness.org

The costs and procedures involved in exporting (and importing) a standardized shipment of goods are studied. Every official procedure involved is recorded - starting from the final contractual agreement between the two parties, and ending with the delivery of the goods.

Time & Documents needed for export a standardized cargo* (DB 2012 Report)



Trading Across Borders in

Iran, Islamic Rep.

| Export Procedures | Duration (days) | US\$ Cost |
|---|-----------------|-----------|
| Documents preparation | 12 | 225 |
| Customs clearance and technical control | 2 | 175 |
| Ports and terminal handling | 4 | 225 |
| Inland transportation and handling | 7 | 650 |
| Totals | 25 | 1,275 |

Export documents

Bill of lading
 Certificate of Origin
 Commercial Invoice
 Customs export declaration
 Insurance policy
 Packing List
 Technical standard certificate

7 documents needed



Ease of Doing Business in

Thailand

| Export Procedures | Duration (days) | US\$ Cost |
|---|-----------------|-----------|
| Documents preparation | 8 | 290 |
| Customs clearance and technical control | 1 | 50 |
| Ports and terminal handling | 3 | 85 |
| Inland transportation and handling | 2 | 200 |
| Totals | 14 | 625 |

Export documents

Bill of Lading
 Certificate of Origin
 Commercial invoice
 Customs export declaration
 Terminal handling receipts

5 documents needed

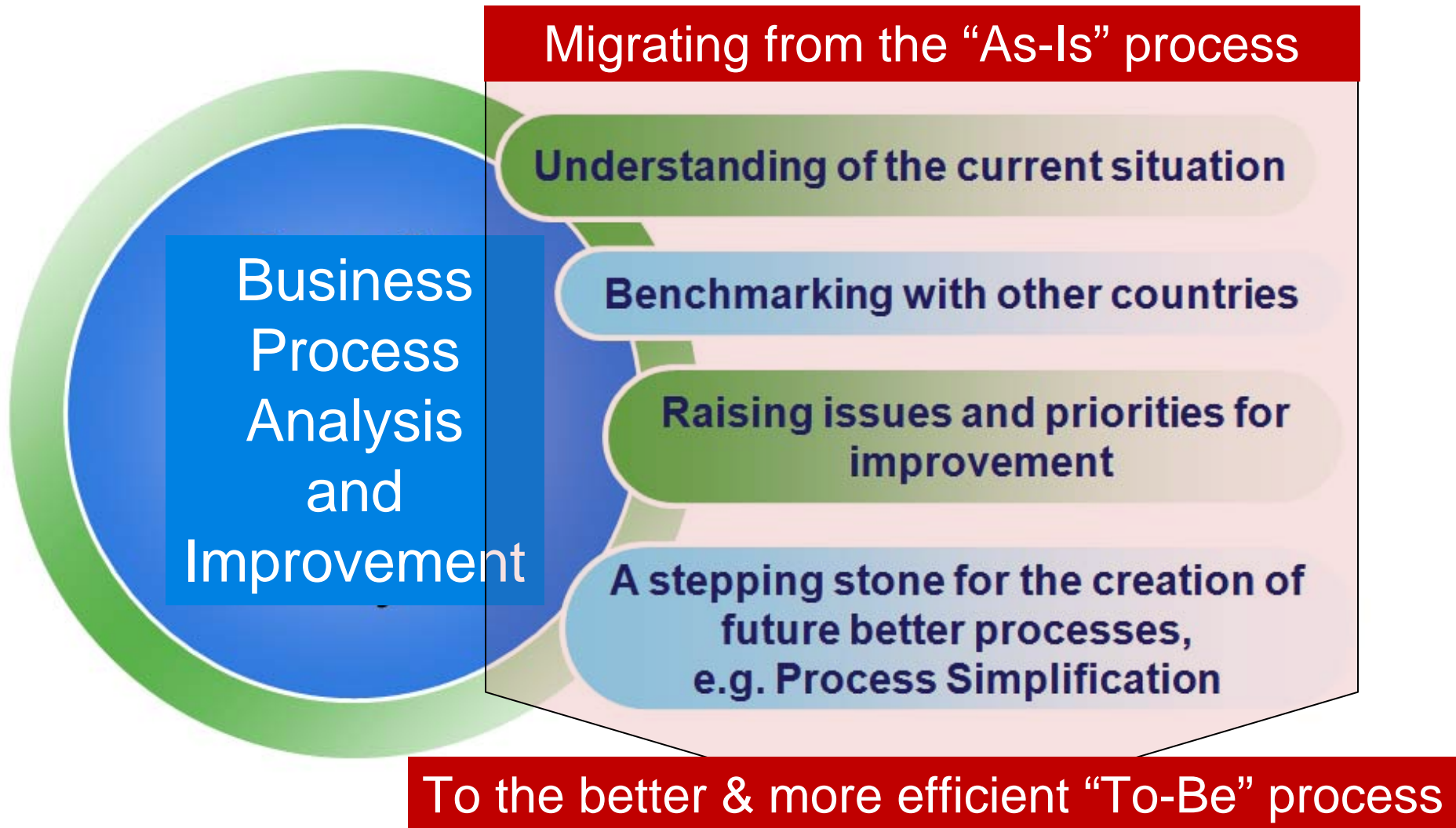
*** More documents will be needed for agriculture or dangerous goods.**

Reference - World Bank's Doing Business – Trading Across Border (April 2012) www.doingbusiness.org

Why trading across borders in some countries are more difficult, time consuming and expensive?

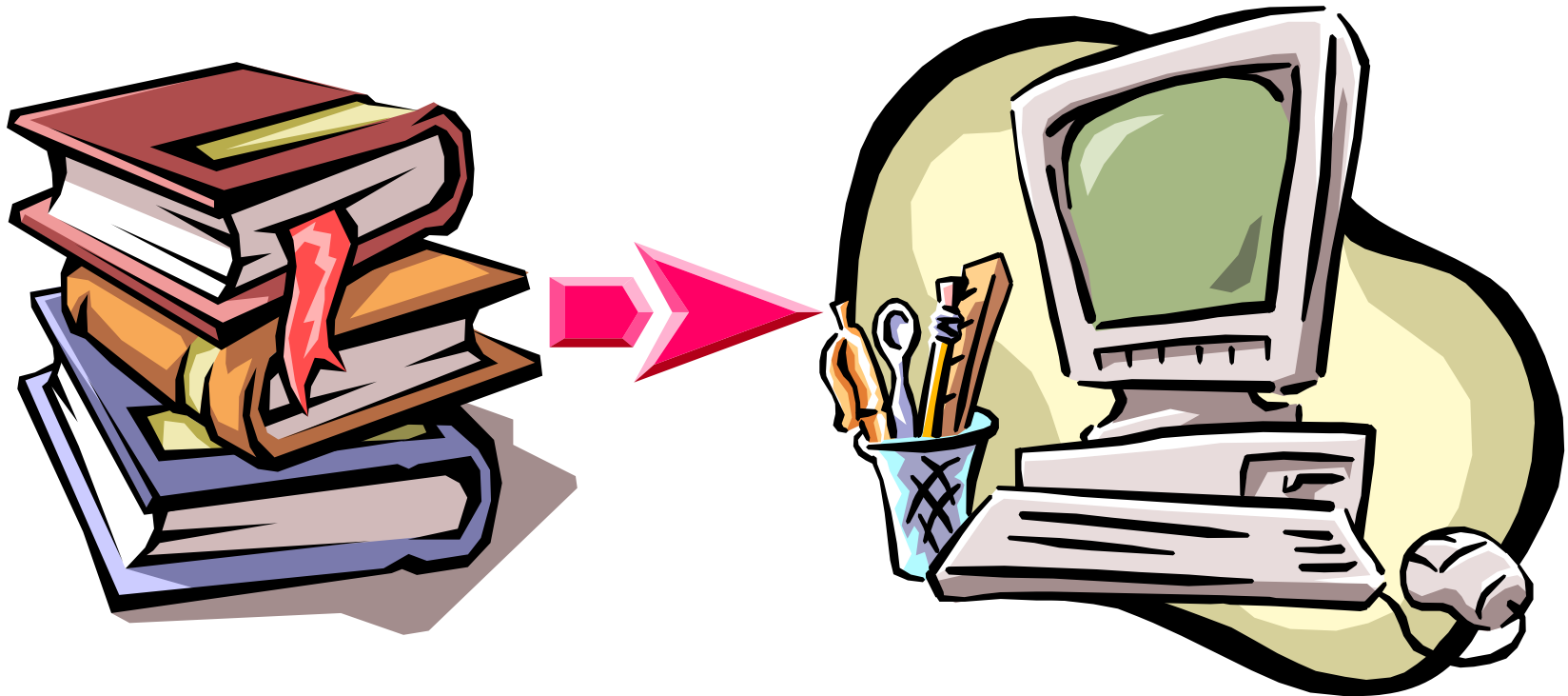
- Procedures and documents handling remain **largely paper dependent**
- **Missing** and **incorrect documentation** slows progress through the supply chain
- Keeping documents & freight in sync is **complex** and **costly**
- **Multiple parties** capturing the same data is **inefficient** and **error prone**
- We acknowledge other factors that makes trade in developing countries more difficult, including **infrastructure**, **corruption**, **land locked**, ... (but these are not the scope of discussion in this forum)

Business Process Analysis & Improvement



Why trading across borders in some countries are easier, faster and less risky?

Mainly because those countries gradually transform/reform their paper-based environments into **Collaborative e-Government/e-Business** platform.

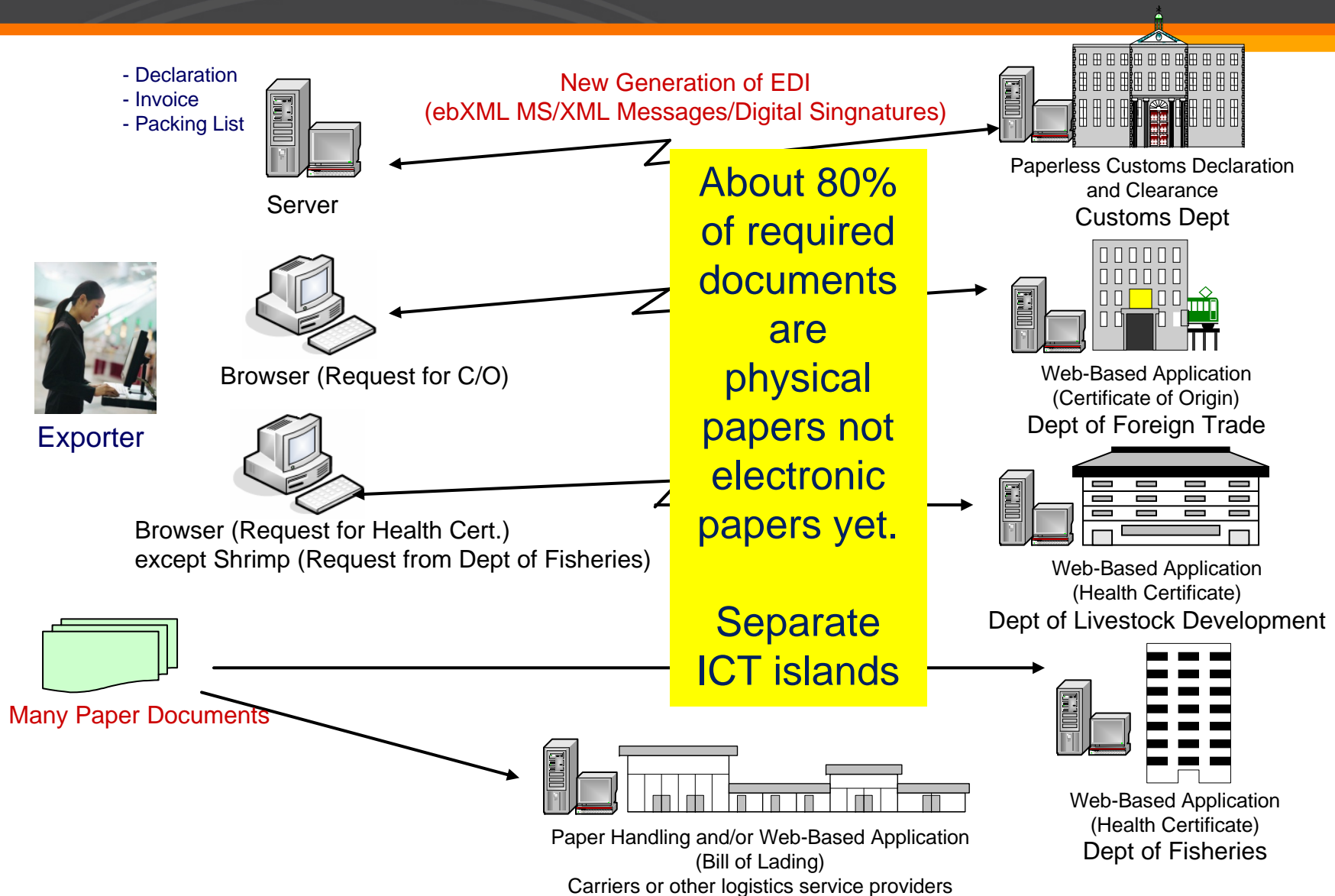


**Paper-based
Environment**



**Paperless or e-Document
Environment**

We need to understand "As-Is" conditions in our own country.



To propose a Conceptual Architecture* of the "To-Be" National Single Window

A Case Example

Technical interoperability protocols are needed, and common definitions of data elements, and semantic data structures (common data models) among different documents required by different organizations are required also.



Exporter

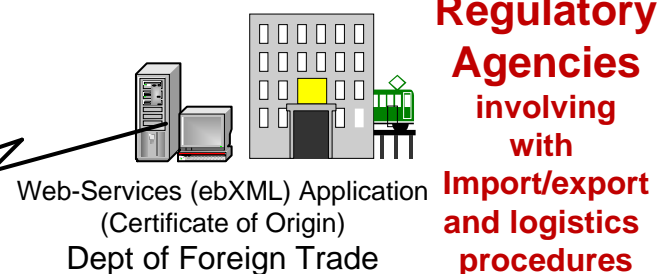
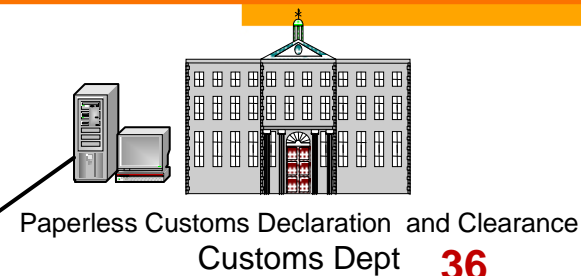


1. National Single Window

[Goal 1] e-Documents Exchange Hub

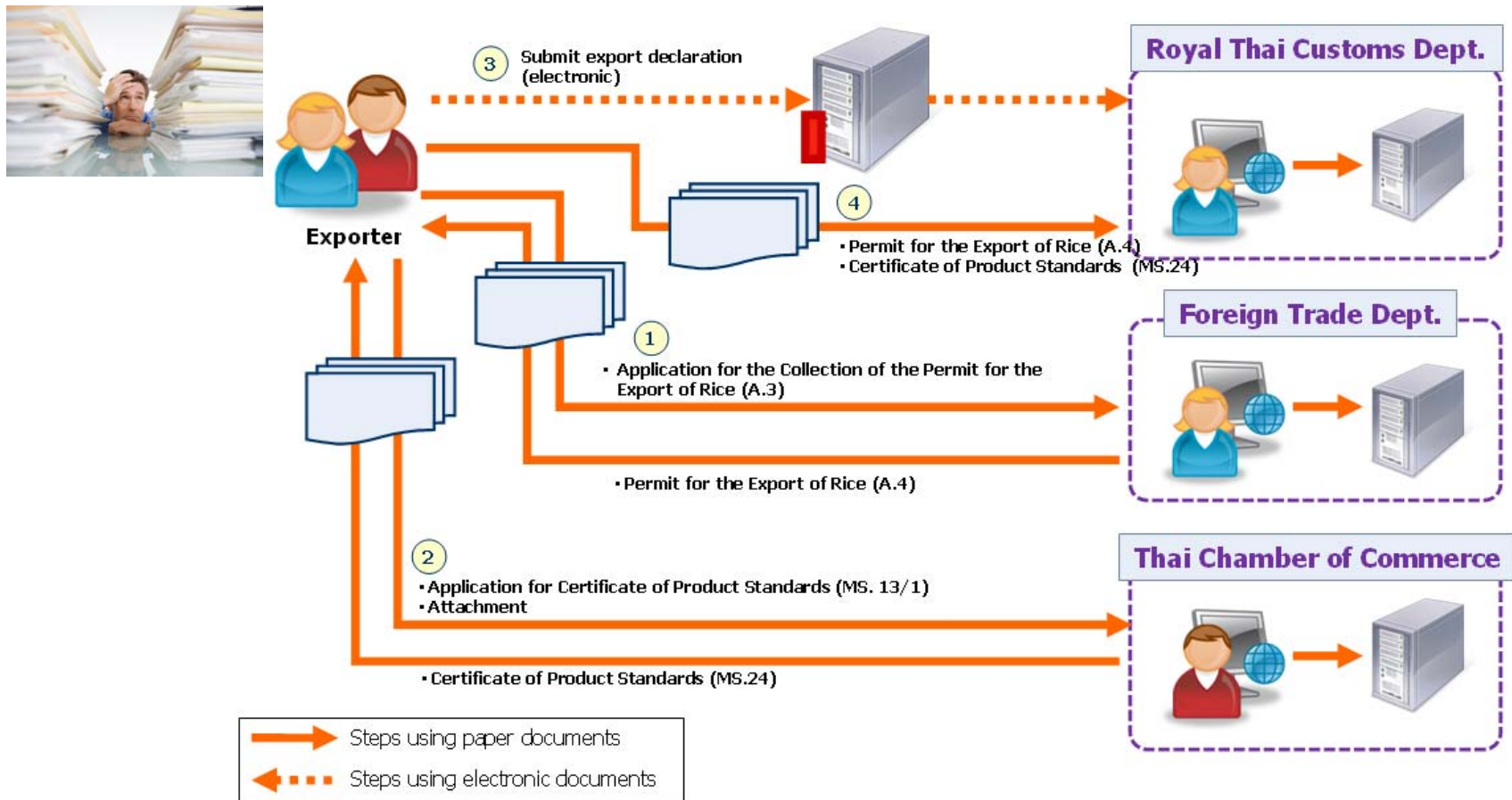
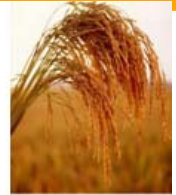
2. [Goal 2] – **Electronic Single Window Entry**
One time submission for each data element but multiple usage for different purposes on different ICT platforms

* as initially proposed for discussion and feedback with key stakeholders in 2007.



Regulatory Agencies involving with **Import/export and logistics procedures**

- Duplicated Information & 3-5 physical visits to different locations
- High Cost and Time for sending and receiving documents
- Possible Data Inconsistency

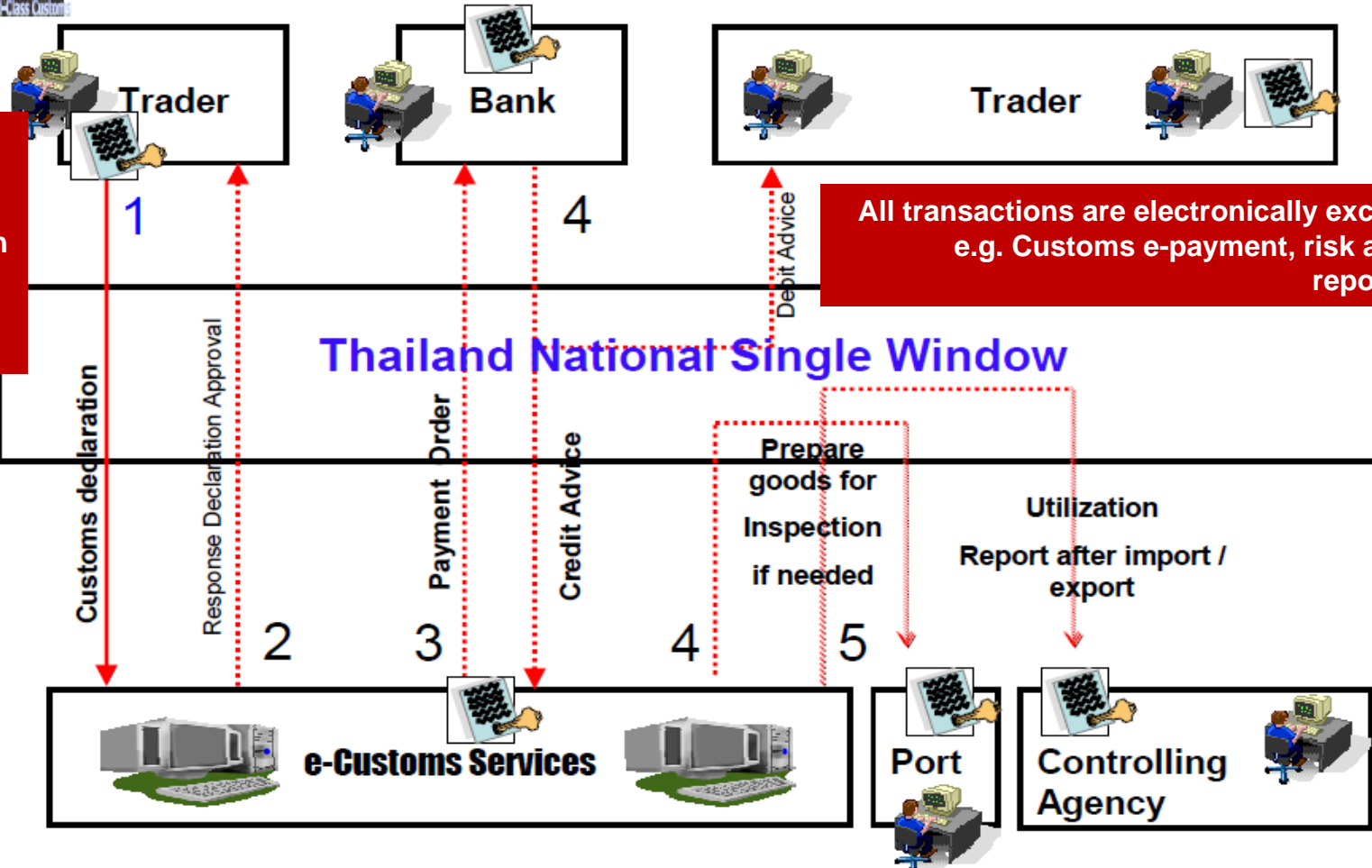


"To-Be" Paperless Customs Procedures

A Case Example

(an initial concept study in 2005, proposed for the development from the "As-Is (then)" paper-based documents and partial electronic procedures)

A Single Submission of Electronic Customs Declaration



Referring to – 'Thailand NSW' presentation by
Mr. SINMAHAT Kiatjanon, Thai Customs Department - February 2010., Nepal.

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- Process Analysis and Process Re-engineering

- Data Harmonization

- E-Message Development

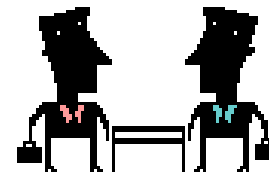
- System Interface

- Online Security

- Use of Technical Standards

Migrating from Physical Papers

- 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
- ..most of the time



..To Paperless (electronic-documents) Trade

- Communication between computers requires **precise definitions** of
 - The processes (who, what, how, when, why)
 - the **meaning of data (semantics)**
 - ..and the **structure of the data**



□ ..all the time!



Example – Exchanged Documents

**Rice Quality Certificate
By The Thai Chamber
of Commerce**

**Type of Products
Weight
Price
Mode of Transport**

**Permit for the export of
rice by Department of
Foreign Trade**

มส. 24-001-50 No.002618

ใบรับรองมาตรฐานสินค้า เลขที่ E.....

เลขที่ประจำตัวผู้เสียภาษี.....

ใบรับรองเลขที่ ขม.

คำร้องขอเลขที่ ขม.

ข้าวหอมมะลิไทย

ใบรับรองมาตรฐานสินค้า

ใบรับรองมาตรฐานสินค้านี้ ออกให้แก่.....

ใบทะเบียนเลขที่ ผศ. ซึ่งประสงค์จะส่งสินค้ามาตรฐานออกนอกราชอาณาจักร เพื่อแสดงว่าผู้ถือใบรับรองมาตรฐานสินค้านี้ ได้จัดให้มีการตรวจสอบมาตรฐานสินค้า ที่จะส่งหรือนำออกนอกราชอาณาจักร ตาม มาตรา 17 แห่งพระราชบัญญัติมาตรฐานสินค้าออก พ.ศ. 2503 ซึ่งแก้ไขเพิ่มเติมโดยพระราชบัญญัติมาตรฐานสินค้าออก (ฉบับที่ 2) พ.ศ. 2522 แล้ว ปรากฏผลดังมีรายละเอียด ต่อไปนี้

1. สินค้าข้าวหอมมะลิไทย.....ประเภท.....ชนิด.....

ปริมาณ.....น้ำหนัก.....กก. มูลค่า.....บาท


น้ำหนักเฉพาะ.....กก. น้ำหนักรวม.....กก. ราคา.....ต่อหน่วย

2.2 ปริมาณ.....น้ำหนัก.....กก. มูลค่า.....บาท

น้ำหนักเฉพาะ.....กก. น้ำหนักรวม.....กก. ราคา.....ต่อหน่วย

2.3 ปริมาณ.....น้ำหนัก.....กก. มูลค่า.....บาท

น้ำหนักเฉพาะ.....กก. น้ำหนักรวม.....กก. ราคา.....ต่อหน่วย



ใบอนุญาต
ให้ส่งสินค้าออกนอกราชอาณาจักร (ข้าว)
(เพื่อการค้าเป็นการค้า)

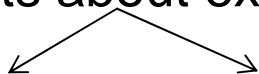
แบบ อ. 4

| | | | | | |
|--------|-----------|--------------------------------|---------------|---------------|---|
| เลขที่ | วันที่ออก | ผู้ซื้อ (ชื่อ, ที่อยู่, ในนาม) | ประเทศผู้ซื้อ | ประเทศปลายทาง | สำหรับเจ้าหน้าที่ศุลกากรบันทึก (หากไม่พอให้ต่อตารางเพิ่ม) |
| | | | | | |

| ท่าเรือที่ส่งออก | สกุลเงิน | อัตราแลกเปลี่ยน |
|------------------|-----------------|---------------------------|
| รวมผลผลิตสินค้า | ประเภทผลิตภัณฑ์ | น้ำหนักสุทธิ (กก./ปริมาณ) |
| | ราคาต่อหน่วย | มูลค่า เสงโથી (เงินบาท) |
| | ประเภทผลิตภัณฑ์ | น้ำหนักสุทธิ (กก./ปริมาณ) |
| | ราคาต่อหน่วย | มูลค่า เสงโથી (เงินบาท) |

Example – Defining data element names and definitions for 2 documents by comparing with International Standards

2 documents about exportation of rice



| Permit for the export of rice | Rice Quality Certificate | Data Element Name | Definition |
|-------------------------------|--------------------------|-------------------|---|
| weight (kg.) | Net Weight (kg.) | Net Weight (item) | [TDED 6020] The measure of the net weight (mass) of this cross-border trade line item, excluding all packaging. |
| Unit Price | Price | Unit Price (item) | [TDED 5110] Price per unit of quantity on which an article item amount is calculated. |
| Name of transport | Ship's name | Name of Transport | [TDED 8212] Name of a specific means of transport such as the vessel name |

What is Data Harmonization?

- Data harmonization is an act of reconciling the definitions and representation formats of data elements (among a set of relevant documents).
 - It improves the consistency of meanings (semantic) and representation formats of data elements
- Data harmonization will identify a set of core data elements (data elements expressed using different descriptions but with identical meaning)

| | Source | Certificate of Product Standards | Phytosanitary Certificate | Certificate of Origin |
|-----------------------|---|----------------------------------|---------------------------|-----------------------|
| Core Data Element 1 { | Definition 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 |

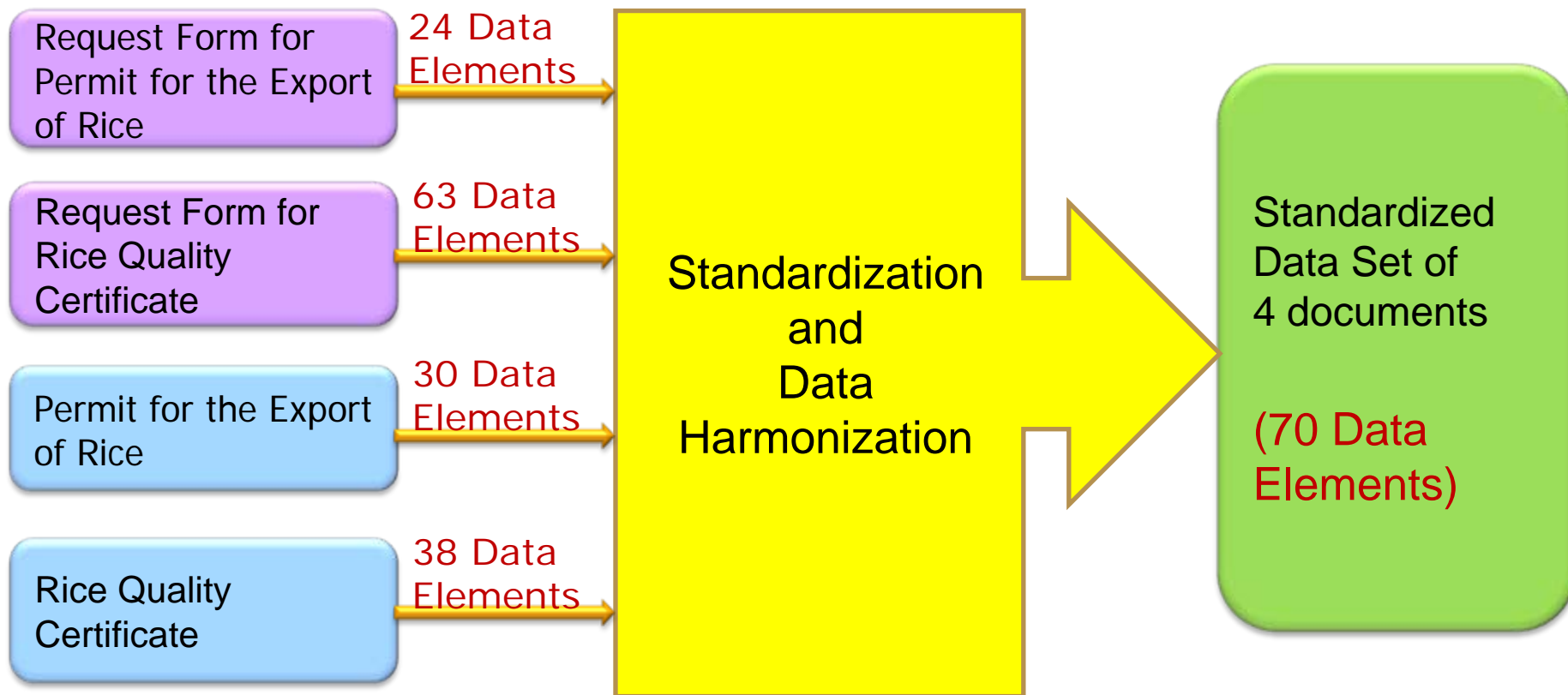
* International Standards for Phytosanitary Measures, Guidelines for Phytosanitary Certificates (Publication No. 12)

** UN/CEFACT Export Certification (eCert) RSM

Data Harmonization/Standard Project

- Secure the political support and resources to conduct the Data Harmonization and Standards Project
- Agree on the scope of **a data harmonization project** that matches the scope of the Business Process Analysis
- Define each **data element in terms of definition**, data type, data format, and data constraints in actual operation
- **Analyze data elements across various documents** and organize them in a comparable manner
- Map the data elements to **selected standard data model, e.g. CCL, WCO DM v3.0, ...**

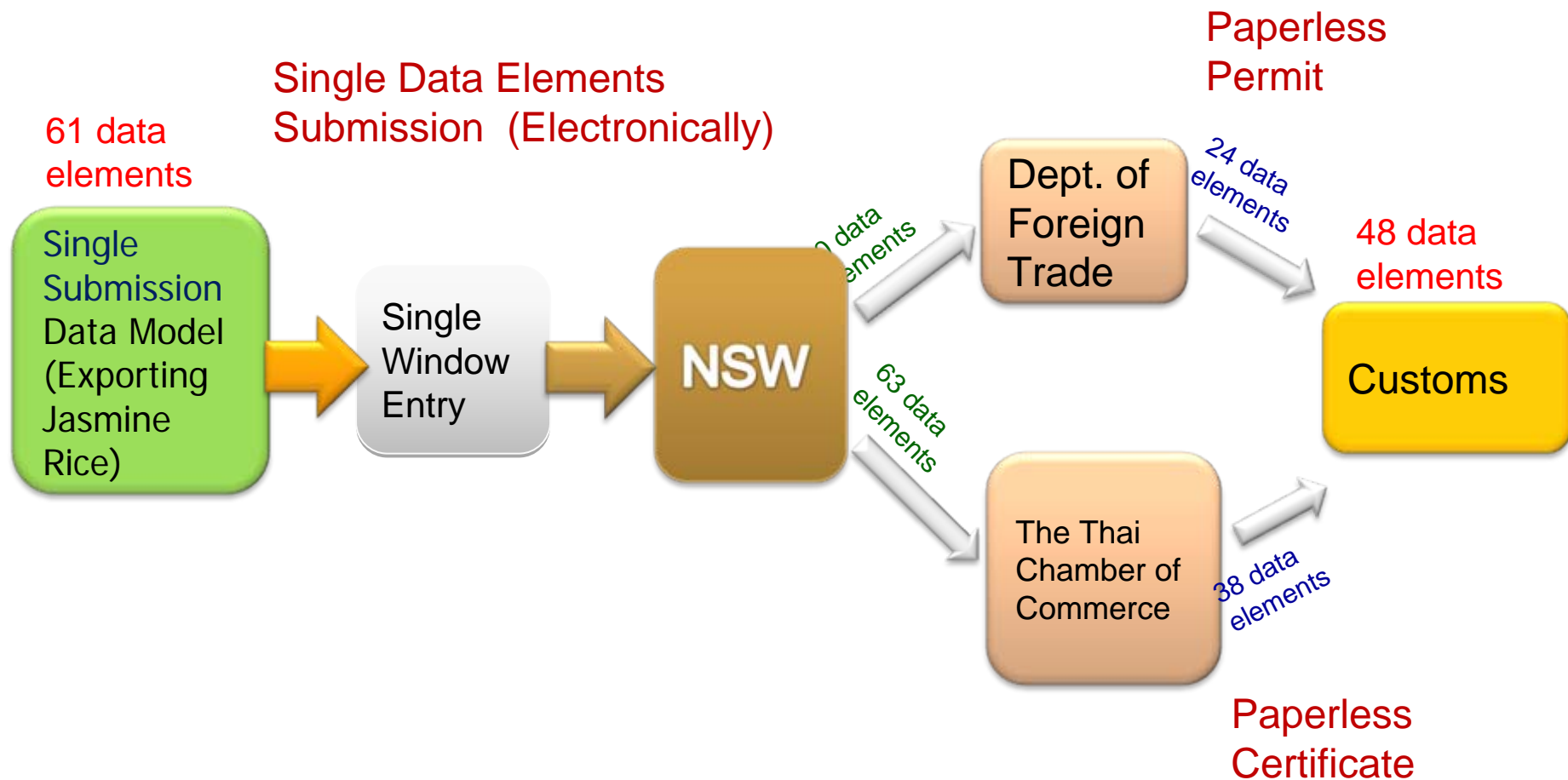
Example - Data Harmonization of 4 documents (Exporting Rice)



Standardization and Harmonization can reduce the data elements from $24 + 63 + 30 + 38 = 155$ data elements from 4 documents to 70 data elements for a standardized data set

Example - Data Harmonization of 4 documents

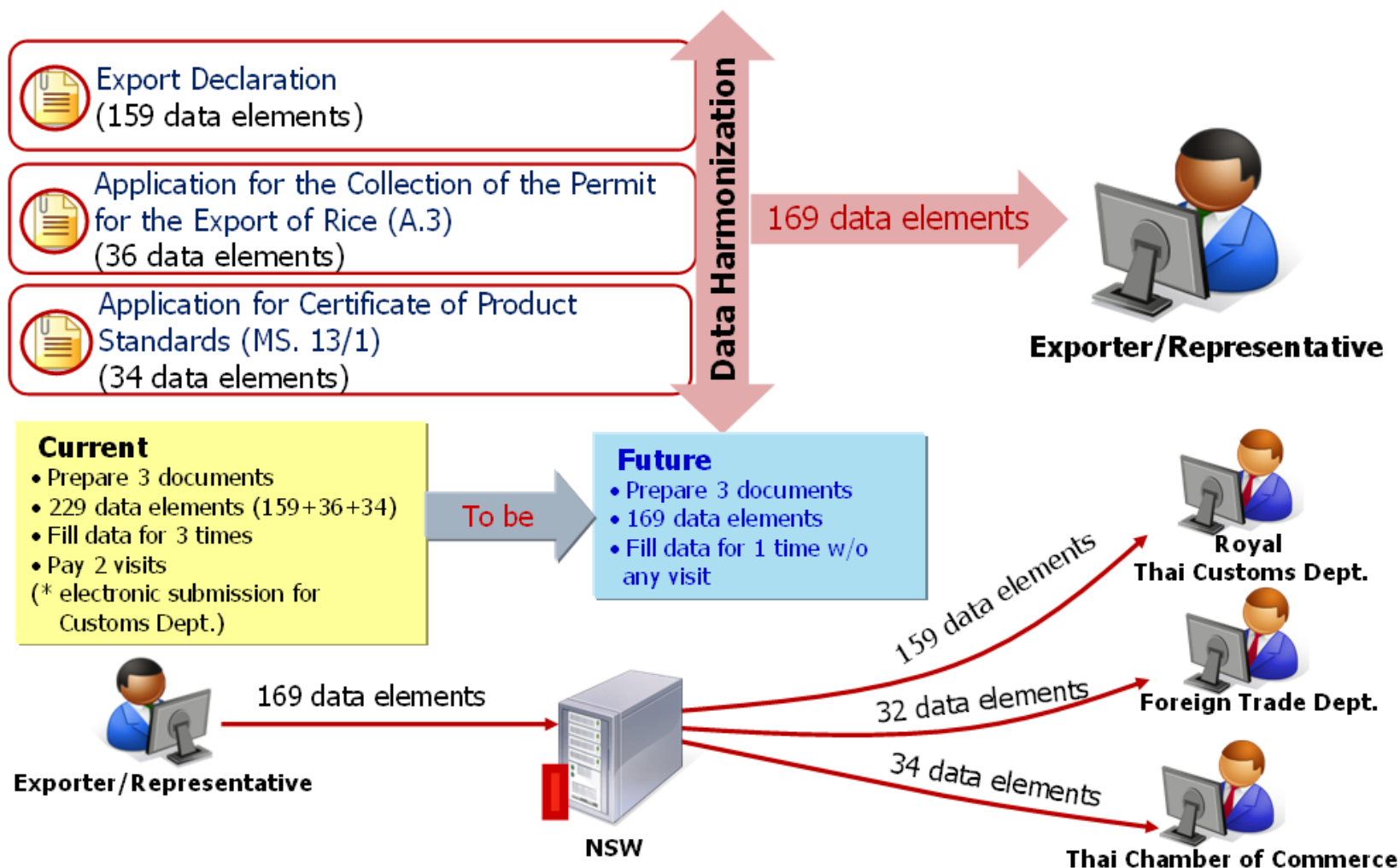
(Semantic Interoperability among these data elements are important)



This is for illustration only.

Data Harmonization and Business Process Simplification

Preparation of Electronic Documents for Jasmine Rice Exportation



Topics of this presentation

To introduce technical issues (what are they, and why they are important) related to SW Implementation

- Process Analysis and Process Re-engineering
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- E-Message Development
- System Interface and System Interoperability
- Online Security
- Use of Technical Standards

Interoperability

Interoperability is needed for connectivity
not only within the country, but also among regional member countries

Interoperability is needed in 4 levels

- **Common Business Process (Process Harmonization)**
- **Document and Data Simplification (Data Harmonization)**
- **Common Technical Communication Protocols**
- **Legal Harmonization**

Standards are needed to achieve the above interoperability.

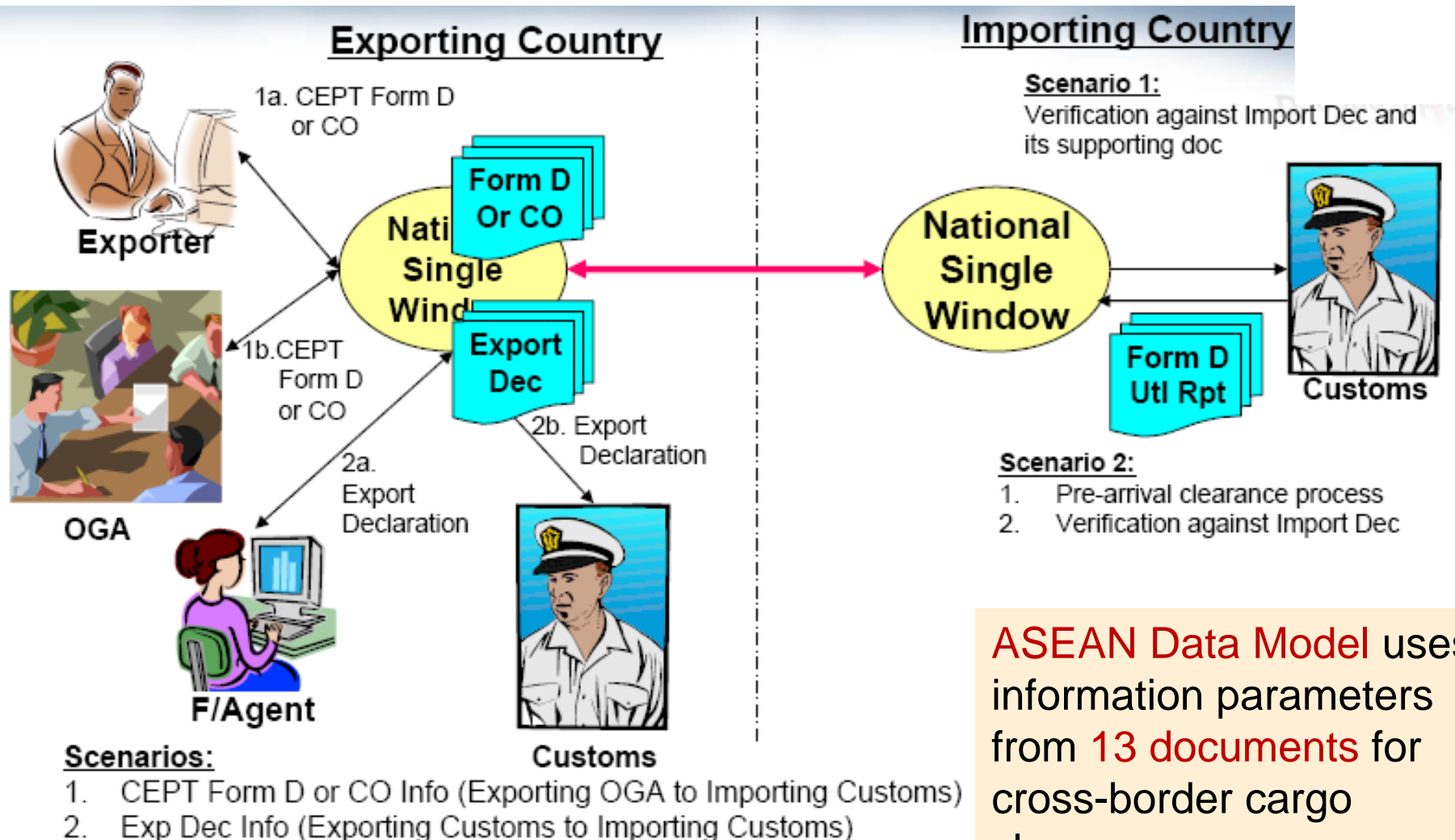
Using Standards for Document & Data Simplification

- **Objective:** Define data from a business perspective; harmonise, simplify, standardise data and documents

- UNLK: Align documents to international standards
- Code Lists: Define codes and data formats
- UNTDED: Define data using standard semantic
- Compare data among documents and simplify

Standards & Tools: UN Layout Key, UNTDED (ISO 7273), ECE/CEFACT Recommendations, CCL, CCTS, WCO Data Model 3.0, IATA,...

A Regional Connectivity: ASEAN Single Window



ASEAN Data Model uses information parameters from **13 documents** for cross-border cargo clearance.

Thai Case Example

TH e-GIF

Thailand e-Government Interoperability Framework

Standard recommendations for Collaborative e-Government,
and particularly for Thailand NSW,
e.g. all 35 government agencies using
ebXML Messaging Services for
e-Document Exchange through NSW exchange hub.



Components within TH e-GIF

1. **National-level policy recommendations** for promoting Collaborative e-Government Development
2. **Methodology** on how to develop Collaborative e-Government by adopting **Enterprise Architecture Approach** (EA Development Methodology)
3. Guidelines on how to conduct **business process analysis**
4. Steps on how to conduct **data harmonization** exercises with common data set and formats, and e-documents
5. Recommended **technical protocols** and **standards** for **interoperability and security** (95 items within 7 categories)

Conclusions & Recommendations - 1

1. **Business Process Analysis (BPA)** must be conducted during the analysis of any SW project
(really understand the as-is procedures and documents handlings, and really understand what should be the new “to-be” processes to be included in the SW master plan).
2. **Data Harmonization/Simplification and e-Message Agreement** is a necessary exercise
(as a step to analyze and agree on how to transform paper documents into electronic documents).

Conclusions & Recommendations - 2

3. Prioritize the SW scope(s) for **iterative implementation** based upon the context, needs and the strategy of the country, e.g.
Development of e-customs declaration first, then e-cargo clearance at some major ports, etc.
4. Analyze and agree upon the **new business process** as the common standard for **within-the country connectivity**, and **regional connectivity** (e.g. single-stop cargo clearance at the border).
5. Conduct the targeted **document and data simplification** based on international standards, e.g. UNLK, WCO DM 3.0, CCL, ...
6. Adopt international standards for **technical interoperability**, e.g. ebXML Message Services, UN/CEFACT XML NDR, Security Standards, ...
7. Develop your **SW architecture** (Business, Data, Application, Technology)
8. Handle your **change management** carefully

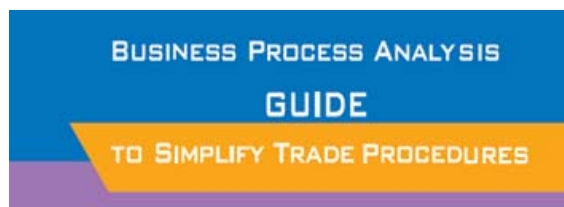
.....

UNNExT Guides



www.unescap.org/unnnext

1.



2.



3. UNNExT Managerial Guide on SW Planning and Implementation (in an editorial process, expectedly to be published within 3 months)

4. (Drafting) UNNExT Legal Guide for Single Window/paperless Trade

References

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- Somnuk Keretho, "(draft) **Managers' Guide for Single Window Planning and Implementation**" October 2011, to be published as an UNNExT guide and a global training will be conducted in December 2011, Geneva
<http://www.unece.org/tradewelcome/capacity-building-for-trade-facilitation/global-trade-facilitation-conference/workshop-programme.html>

Thank you for your kind attention.



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