Dr. Luca Urciuoli

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Associate Professor KTH – Royal Institute of Technology
Research Affiliate, MIT – Center of Transport & Logistics

ZLC | MIT GLOBAL SCALE NETWORK
TALENT HUB FOR SUPPLY CHAIN

KTH VETENSKAP OCH KONST

MIT Center for Transportation & Logistics

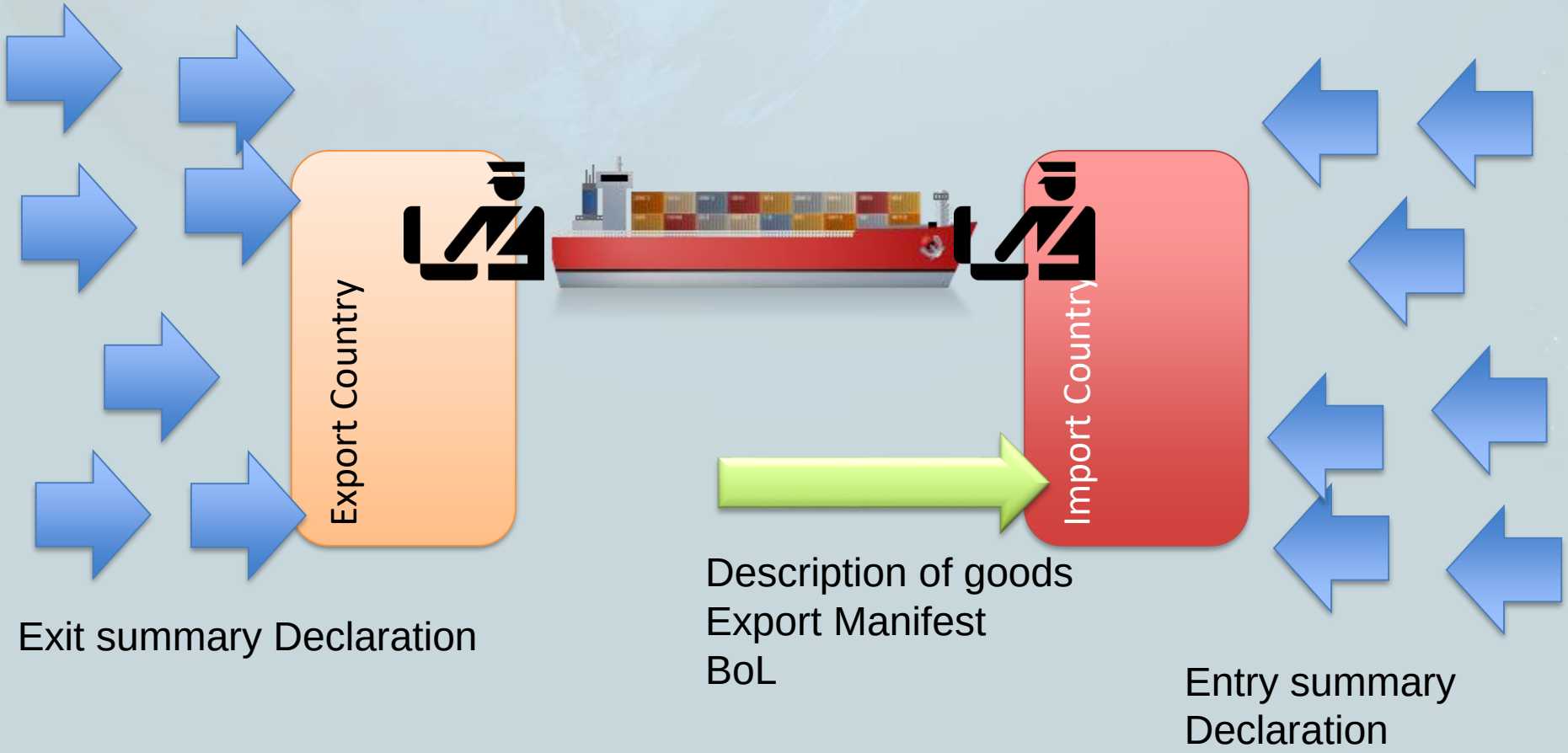
Agenda

- Challenges of global supply chains
- The role of CORE digital eco-system
- CORE demonstrators
  - Bosch Siemens Home Appliances, washing out uncertainty
  - DHL Spain, The Airbus Defence and Space challenges
- Wrap up and conclusions

SECURITY – THE PUBLIC PERSPECTIVE

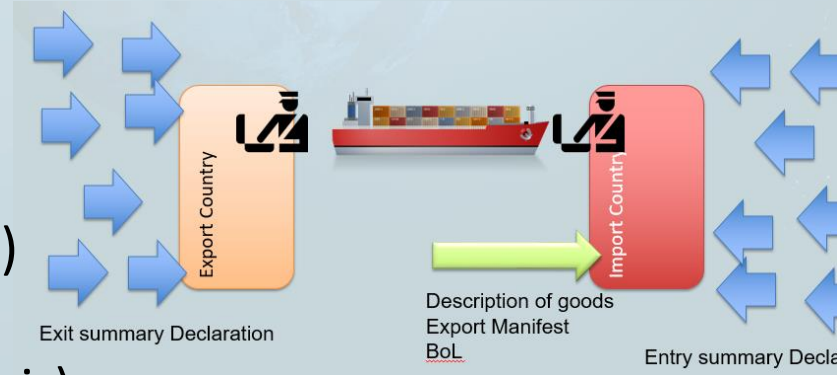
OCTA (2008)

Business and Governments Role in SCS



Business and Governments Roles

- Several Stakeholders involved:
  - Customs Administration
  - Buyer/Seller
  - Freight forwarders (Export/Import)
  - Port terminals
  - Transport Carriers (sea, road, rail, air)
  - Customs brokers



- Information is often exchanged manually/paper based
- Much of this information is organized/available in “silos”
- Inefficiencies and transaction cost raise!

A digital eco-system

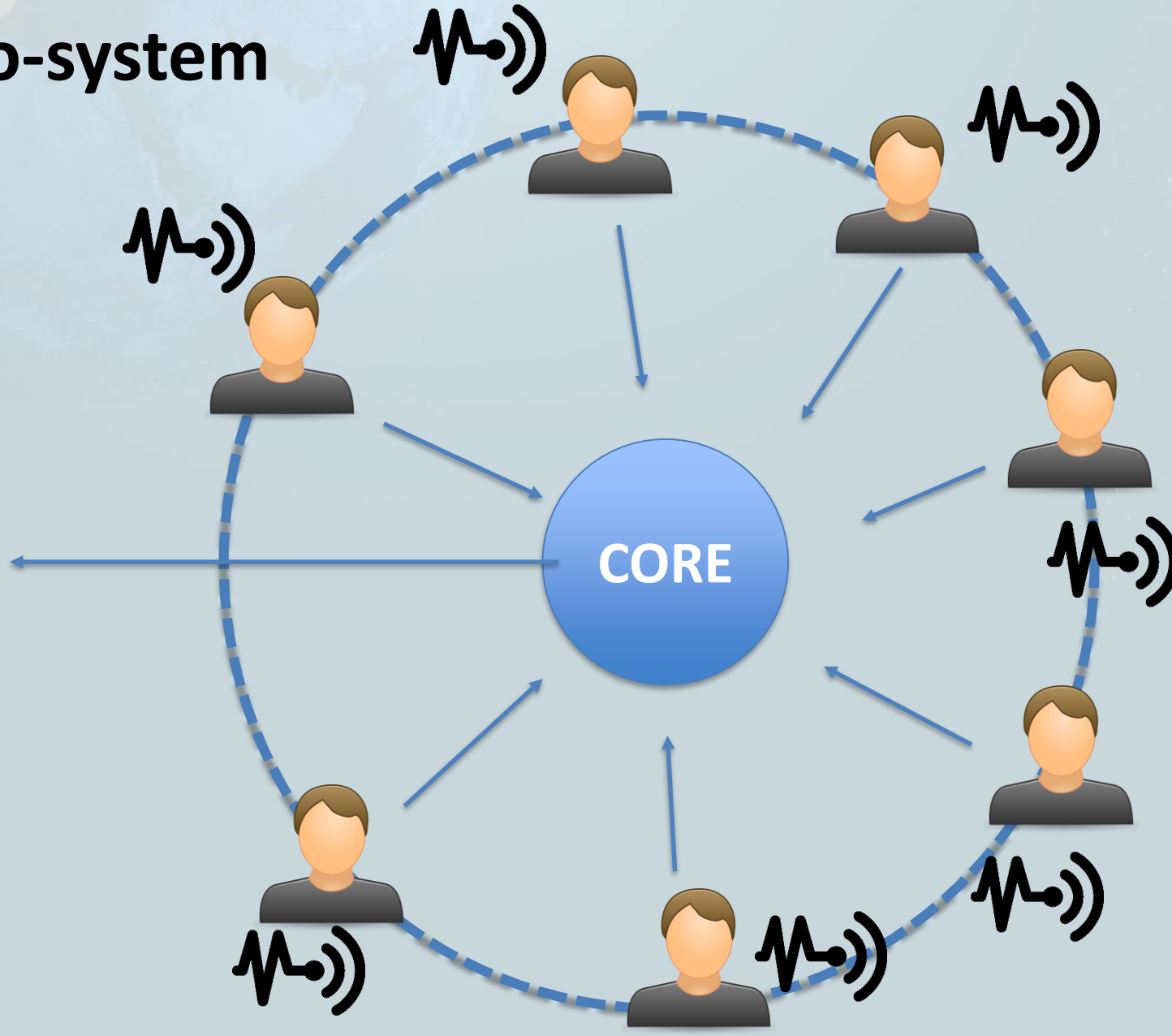
Automatic Entry/Exit declarations

Automatic Transit

Visibility and Risk Management

Automatic Compliance

Algorithmic management



SECURITY – THE PRIVATE PERSPECTIVE

2.611

Transported Asset Protection Association

1.063

Transported Asset Protection Association

€77.665.411

Transported Asset Protection Association

Losses - examples

- Sales value
- Stock outs/customers fulfillment
- Increased costs of insurance and security protection.
- Costs of internal audit activities to detect causes and liabilities.
- Costs of investigation and prosecution of suspects measured in terms of lost time of security and management personnel.
- Increased selling prices and weakened competitive advantage.
- Loss of productivity.
- Loss of business reputation.
- Deterioration in quality of service → health consequences for consumers
- Threat to the survival of the business.

What is being stolen?

Product category/ market segment	*Share (%)*
Non-electronic consumer goods	19
Consumer Electronics	16
Laptops & PDA'S	15
Unspecified	10
Various IT	9
Desktop, Server, Networking	9
Display (Monitor)	5
Mobile Phone	5
Peripheral (Hardware)	4
CPU	2
Supplies	2
Memory, Ram	1
Clothing and Footwear	1
HDD, Storage	1
Food and Beverage	1
Cash/Bullion	0
Pharmaceutical & Medical Products	0
Tobacco Products	0
total (%)	100
total absolute	1530

Source: IIS-database; years: 2003-2006: stakeholder questionnaire, interviews

Transported Asset Protection

- **CORE: Consistently Optimised Resilient Secure Global Supply-Chains**

- **7º FRAMEWORK PROGRAM: FP7-SECURITY**
- **DURATION: 48 months 01/05/2014→30/04/2018**
- **€48 millions budget**
- **More than 70 partners**
- **22 Work Packages**
- **10 Demonstrators**

CORE

Project reference: 603993
Funded under: FP7-SECURITY

Consistently Optimised Resilient Secure Global Supply-Chains

From 2014-05-01 **to** 2018-04-30, ongoing project

Project details

Total cost:	**Topic(s):**
EUR 48 354 957,98	SEC-2013.2.4-1 - Phase II demonstration programme on logistics and supply chain security
EU contribution:	**Call for proposal:**
EUR 29 254 828,99	FP7-SEC-2013-1
Coordinated in:	**Funding scheme:**
Belgium	CP-IP - Large-scale integrating project

CORE main objective is to improve efficiency and security of transport and logistics operations, but also to improve the overall management of global supply chains.

Through enhanced visibility and B2B and B2G information Exchange

Agenda

- Challenges of global supply chains
- The role of CORE digital eco-system
- **CORE demonstrators**
  - Bosch Siemens Home Appliances, washing out uncertainty
  - DHL Spain, The Airbus Defence and Space challenges
- Wrap up and conclusions

CORE PROJECT
Demostrator Airbus Defense and Space

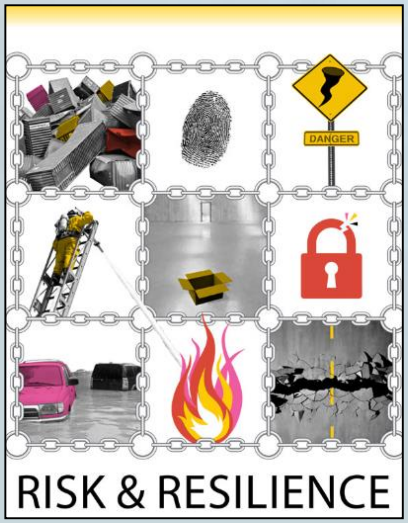
DHL DEMOSTRATOR

DHL manages the supply chain of a Global customer **ADS** (Airbus Defense and Space, sector Aeroespacial).

The demonstrator focuses on the logistics activities implemented by DHL to transport parts/components from a warehouse in Sevilla to an Airbus plant in Poland.

The parts/components arrive to EU from the US by air to Sevilla airport. Thereafter the cargo travel by road to its final destination.

Demonstrator Objectives



- To organize a transport combined with IT enabled services order to improve security and efficiency to a satisfactory degr for the client.

- To adapt and monitor security controls in real time to transp from the point of loading to unloading destination.

- To perform risk analysis before, during and after each transpo

- To design hardware specification to be installed in trucks order to enhance tracking and security monitoring.

- To design and develop a software to monitor and provide r time information of cargo and its status en-route.

- To design and put into operations a Security Control Tower.

TRADE LANE

SENSORS IN TRUCKS

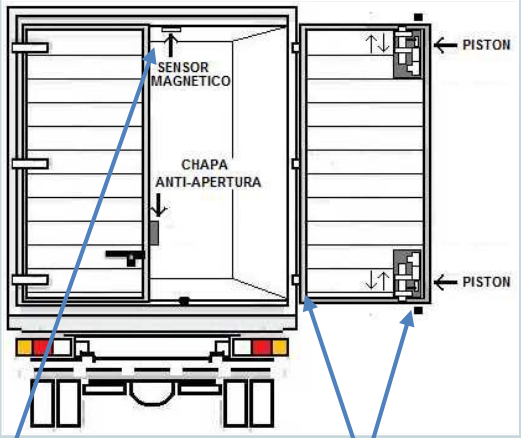
SECURITY CAMERA

GPS POSITIONING

INDEPENDENT SECURITY SYSTEM (TRACTOR/TRAILER)

TRAILER DETACHING DETECTION

«Geo Fence» Off-route Alarm



ENGINE IMMOBILIZER

PANIC BUTTON IN DRIVER'S CABIN/BED

SELF-POWERED ALARM SIREN

DOORS OPENING SENSORS

LOCKS AND HINGES

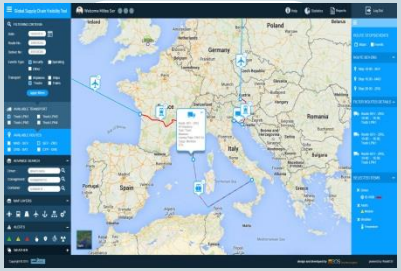
SECURITY SYSTEM

SENSORS

WEMOB

USERS

CRA

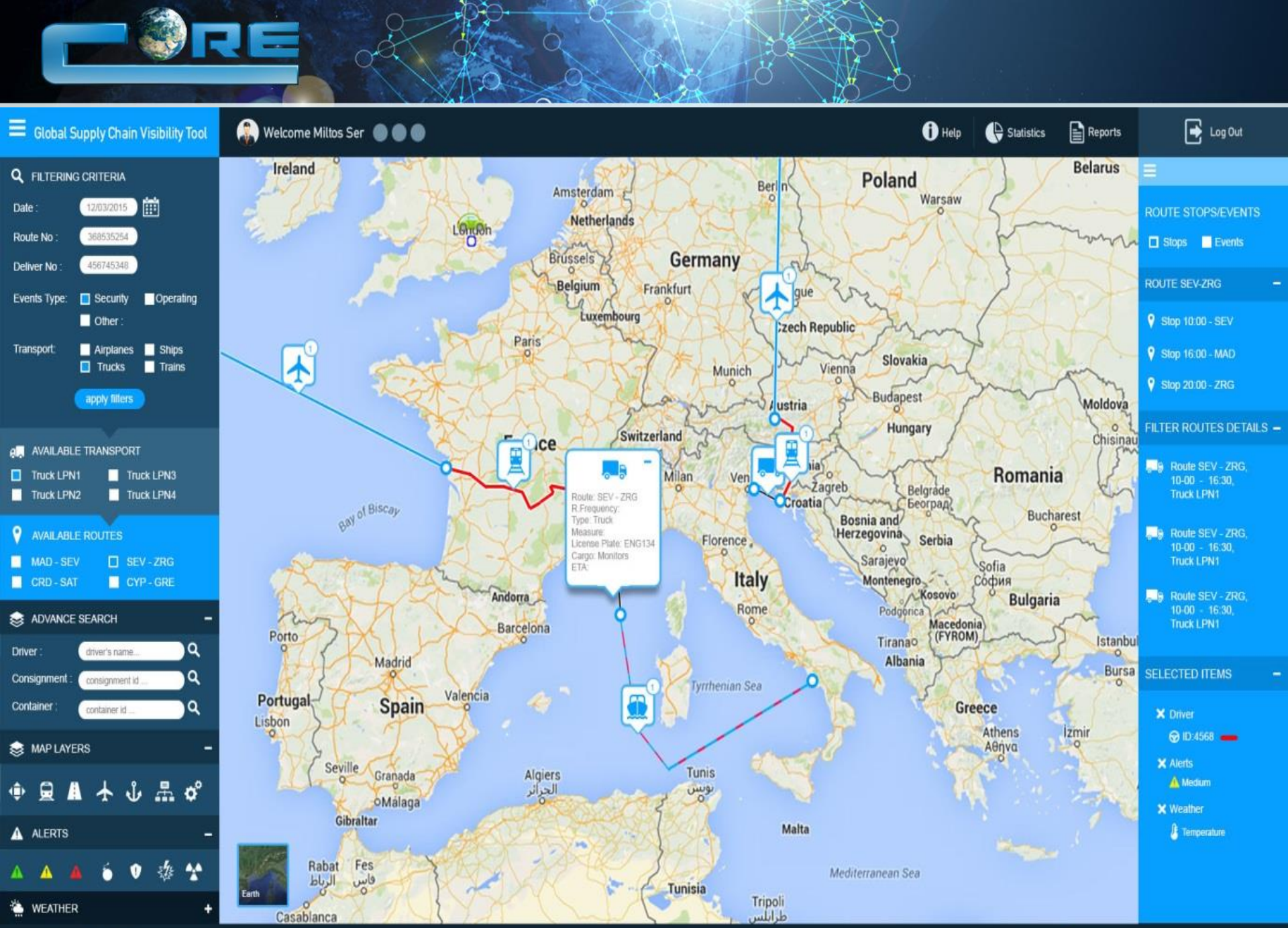


VISIBILITY TOOL

OPERATIONS

AM+

Control Tower



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Global Supply Chain Visibility Tool

Register | Log in | Help | Statistics | Reports

Filtering Criteria

Pickup Time:

Delivery Time:

Route No:

Transport Request No:

Urgent Transport:

Events Type: Secur… Opera… Other

DEMO | Apply Filters

November 2015

Su	Mo	Tu	We	Th	Fr	Sa
25	26	27	28	29	30	31
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	1	2	3	4	5

Today

FILTERING CRITERIA

Date : 12/03/2015

Route No : 368535254

Deliver No : 456745348

Events Type: Security, Operating, Other :

Transport: Airplanes, Ships, Trucks, Trains

apply filters

AVAILABLE TRANSPORT

Truck LPN1, Truck LPN3, Truck LPN2, Truck LPN4

AVAILABLE ROUTES

MAD - SEV, SEV - ZRG, CRD - SAT, CYP - GRE

FILTER TRANSPORT

No	Fr…		y Time	!
	Ma…			
	Ma…			
	Bru…			
	Pari…			
	Pyr…			
	Car…			
	Ulti…			
	Ulti…			
21215UW	Ultimo	Camperdown		
45227MS	Madrid	Seville		
789PP	Paris	Portsmouth		
478US				
459BM				
856MB				
967SC				

ROUTE STOPS/EVENTS

Stops, Events

ROUTE SEV-ZRG

Stop 10:00 - SEV

Stop 16:00 - MAD

Stop 20:00 - ZRG

ADVANCE SEARCH

Driver : driver's name...

Consignment : consignment id ...

Container : container id ...

No of Parcels	Content	ADR Materials	Weight	Dimensions	Driver
12458BC	2811	Paul Ankoud			
12458BC	2811	Paul Ankoud			
12458BC	2811	Paul Ankoud			
12458BC	2811	Paul Ankoud			

MAP LAYERS

ALERTS

WEATHER

ROUTES EVENTS

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Global Supply Chain Visibility Tool

Register Log in

Help Statistics Reports

Filtering Criteria

Pickup Time:

Delivery Time:

Route No:

Transport Request No:

Urgent Transport:

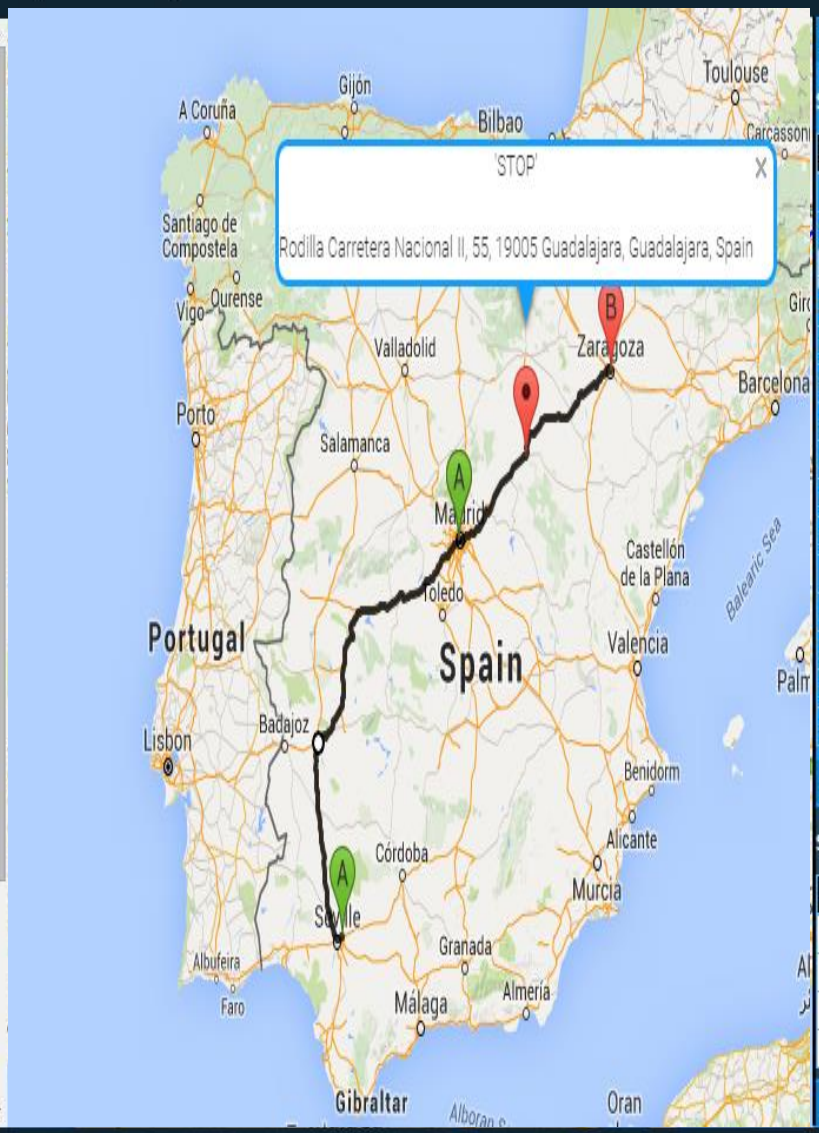
Events Type:
- Security
- Operating
- Other

DEMO Apply Filters

MAP LAYERS

ALERTS

WEATHER



FILTER TRANSPORT

Search:

Select	Transport No	From
☐	15235BP	Madrid
☐	45872MP	Manly
☑	12458BC	Brussels
☐	45122PB	Paris
☐	55123PC	Pyrmont
☐	77458CU	Camperdown
☐	71142UW	Ultimo
☐	44530CU	Ultimo
☐	21215UW	Ultimo
☐	45227MS	Madrid
☐	45789PP	Paris
☐	11478US	LosAngeles
☐	20459BM	New York
☐	22856MB	Seville
☐	58967SC	Madrid

AVAILABLE TRANSPORT

Search:

Select	No of Parcels	Content	ADR Materials
☐	12458BC	2811	Paul Ankoud
☐	12458BC	2811	Paul Ankoud
☐	12458BC	2811	Paul Ankoud
☐	12458BC	2811	Paul Ankoud

ROUTES EVENTS

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Global Supply Chain Visibility Tool

Hello, aaron@ebos.com.cy !

Log off

No:

Events Type:

- [x] Security
- [x] Operating
- [ ] Other

Transport:

- [ ] Airplanes
- [ ] Ships
- [x] Trucks
- [ ] Trains

DEMO

Apply Filters

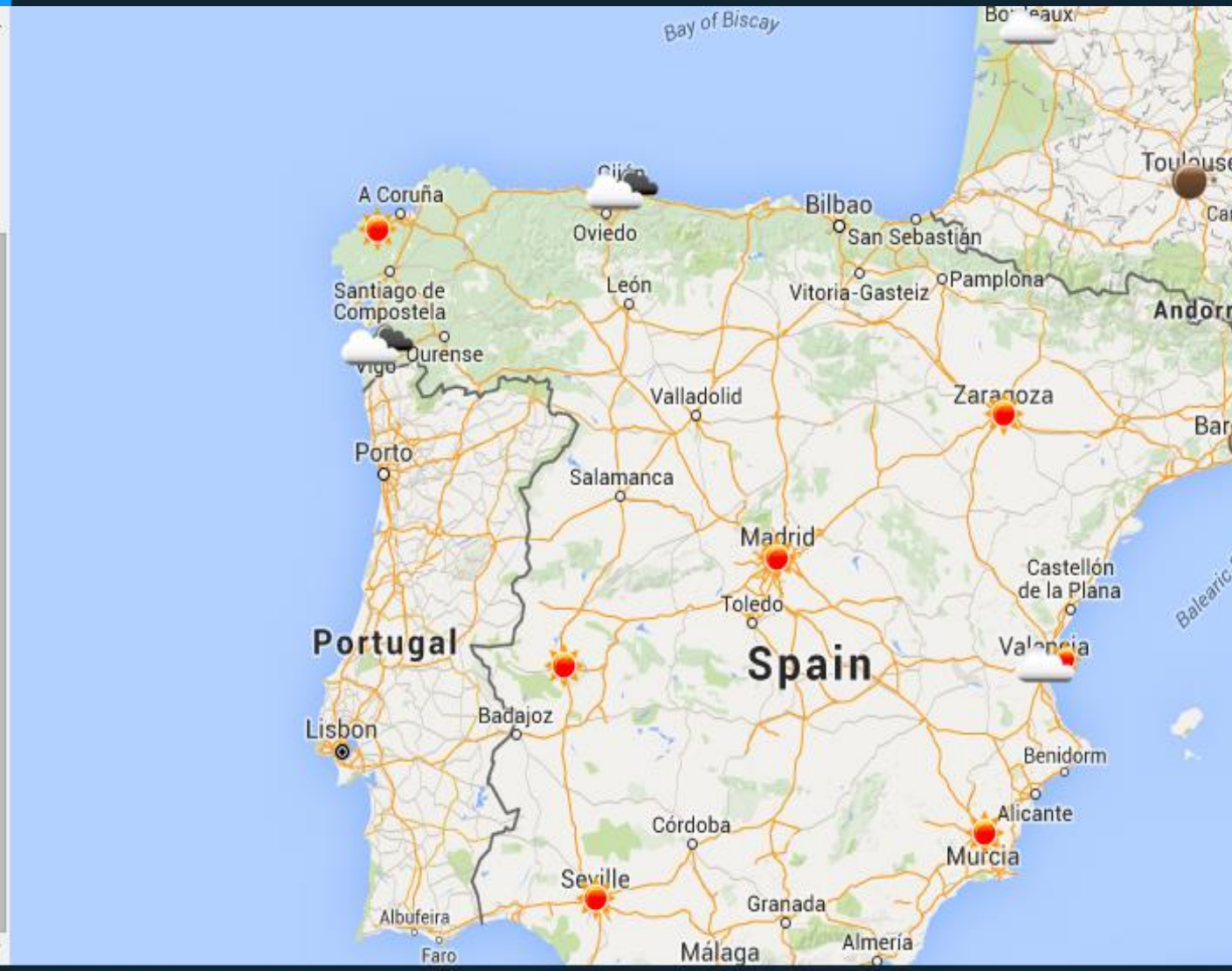
ADVANCE SEARCH +

MAP LAYERS −

ALERTS −

WEATHER −

Temperature



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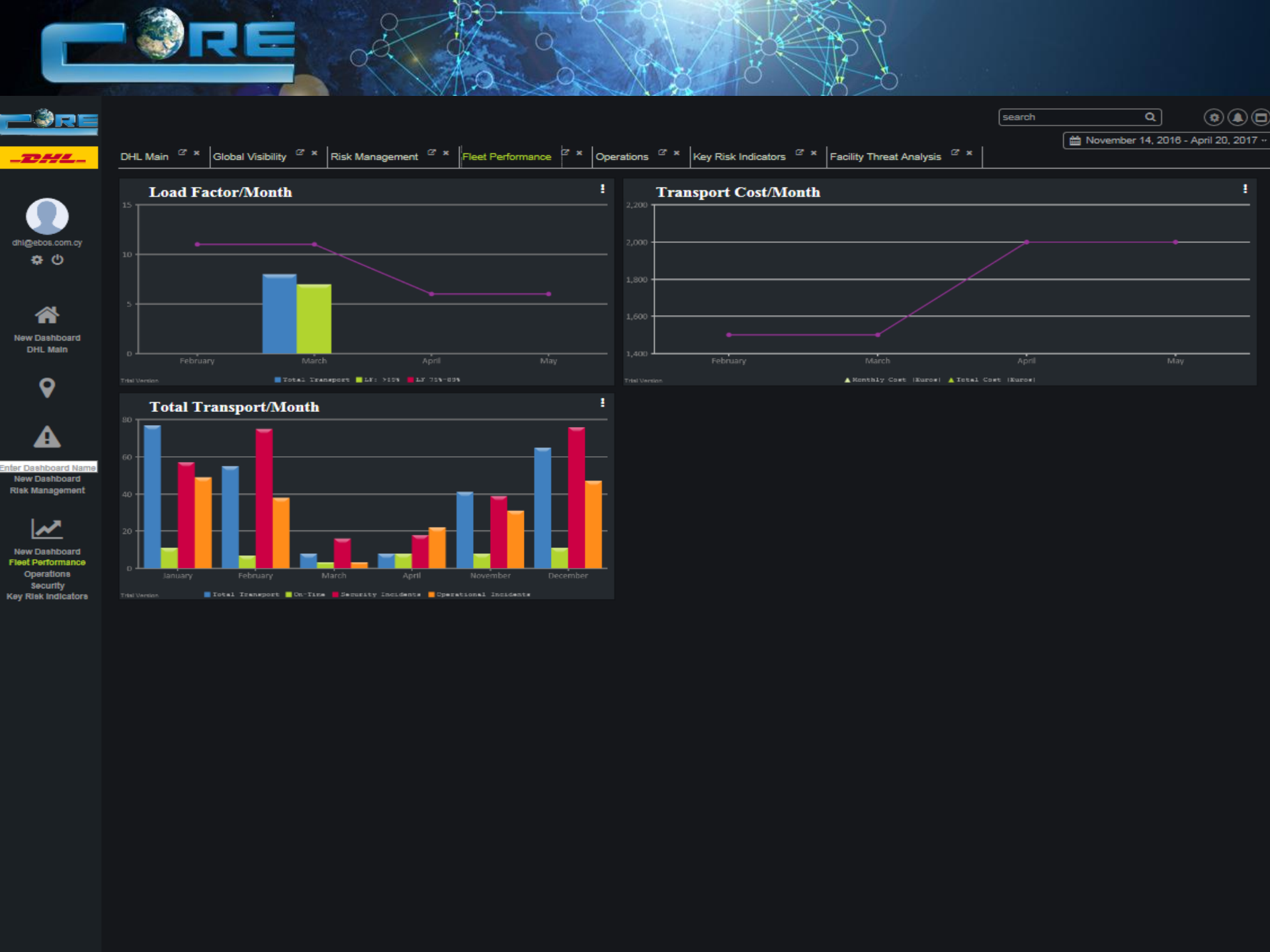
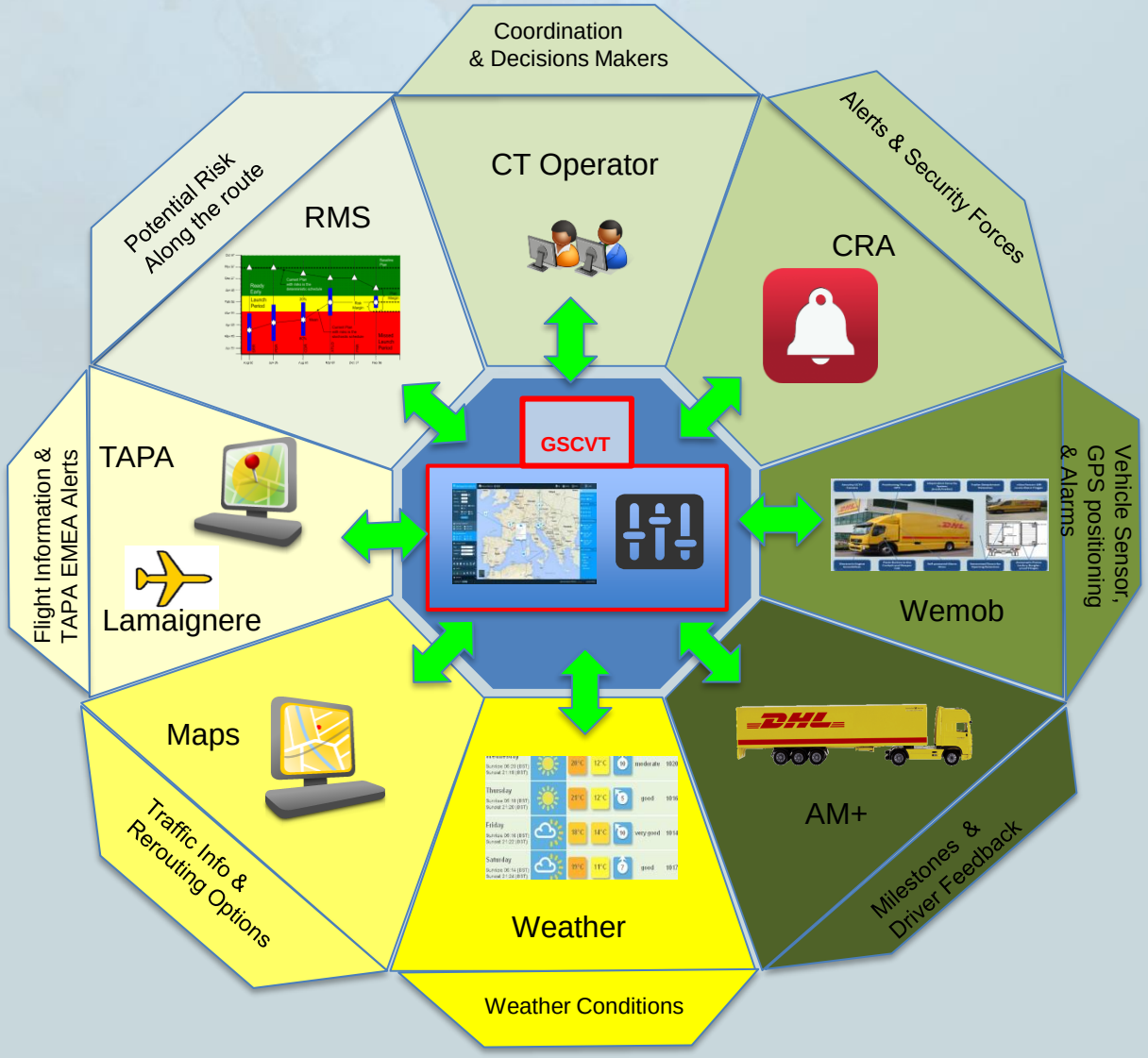
designed and d


CORE
search
November 14, 2016 - April 20, 2017
DHL Main
Global Visibility
Risk Management
Fleet Performance
Operations
Key Risk Indicators
Facility Threat Analysis
dhl@ebos.com.cy
New Dashboard
DHL Main
Enter Dashboard Name
New Dashboard
Risk Management
New Dashboard
Fleet Performance
Operations
Security
Key Risk Indicators
Load Factor/Month
15
10
5
0
February
March
April
May
Total Transport
Transport Cost/Month
2,200
2,000
1,800
1,600
1,400
February
March
April
May
Monthly Cost (Euros)
Total Cost (Euros)
Total Transport/Month
80
60
40
20
0
January
February
March
April
November
December
Total Transport
On-Time
Security Incidents
Operational Incidents

Description	At Origin	In Transit	At Destination
Material is wet	0	863	0
Material wrong packed/ prepare/paletized	0	863	0
Short expiration date	0	863	0
Bar code cannot be read	0	863	0
Material damage	0	863	0
No Purchase Order	0	863	0
Material is wet	0	863	0
Material deteriorated during loadin/unloading	0	863	0
Missing documentation CMR, Delivery Note	0	863	0

Planned ETA	
Actual ETA	
Load Factor	40
Origin	
Destination	
Current Position	
Driver	
Vehicle Number	DF6S32A

search
May 3, 2016 - May 24, 2017
DHL Main
Global Visibility
Risk Management
Fleet Performance
Operations
Key Risk Indicators
Facility Threat Analysis
dhl@ebos.com.cy
New Dashboard
DHL Main
Enter Dashboard Name
New Dashboard
Risk Management
New Dashboard
Fleet Performance
Operations
Security
Key Risk Indicators
Loss Event Risk Analysis
Communications ..
Cyber Crime..
Cargo damage ..
Cargo theft / t..
Theft & Loss..
Damage & Disrup..
Likelihood
Vulnerability
Impact
Trial Version
Radar Risk Analysis
270
180
0
90
Likelihood / Consequence Heatmap
Process Phase: Dos Hermanas to B
Likelihood
Minor
Low
Medium
High
Impact
Minor 0 0 0 0
Low 0 1 1 3
Medium 0 0 0 0
High 0 0 0 0
Facility Risk
Dos Hermanas Customs
Bricoman Warszawa Wilanow
0
0.5
1
1.5
2
2.5
3
Trial Version


Coordination
& Decisions Makers
CT Operator
Alerts & Security Forces
CRA
Potential Risk
Along the route
RMS
GSCVT
Flight Information &
TAPA EMEA Alerts
TAPA
Lamaignere
Vehicle Sensor,
GPS positioning
& Alarms
Wemob
Maps
Traffic Info &
Rerouting Options
Weather
Weather Conditions
AM+
Milestones &
Driver Feedback

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TALENT HUB FOR SUPPLY CHAIN

DHL

CLAIS

Atos

eBOS Technologies

Your I.T. Business Partner

inlecomsystems

conex

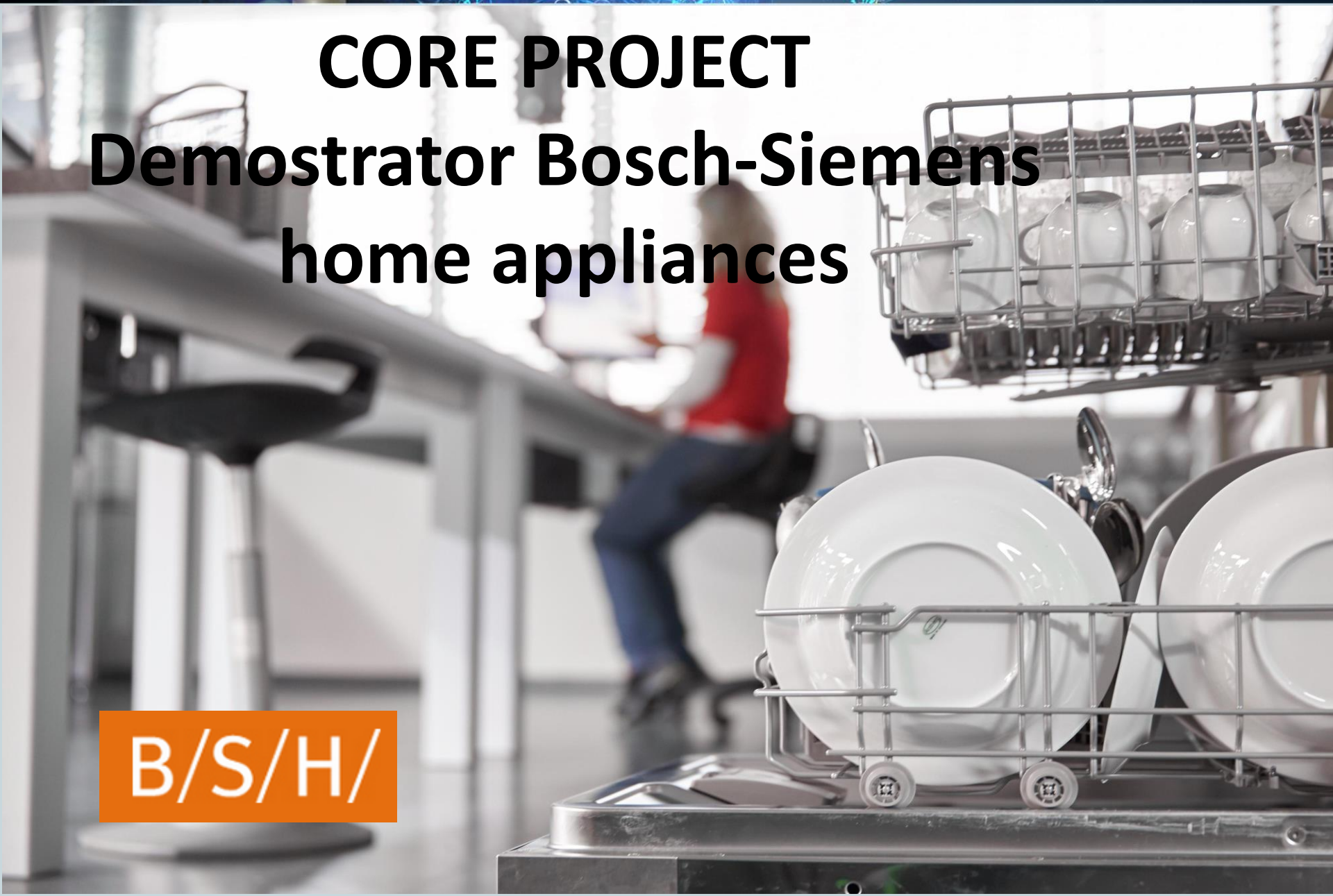
i-way to customs

FOI

enide

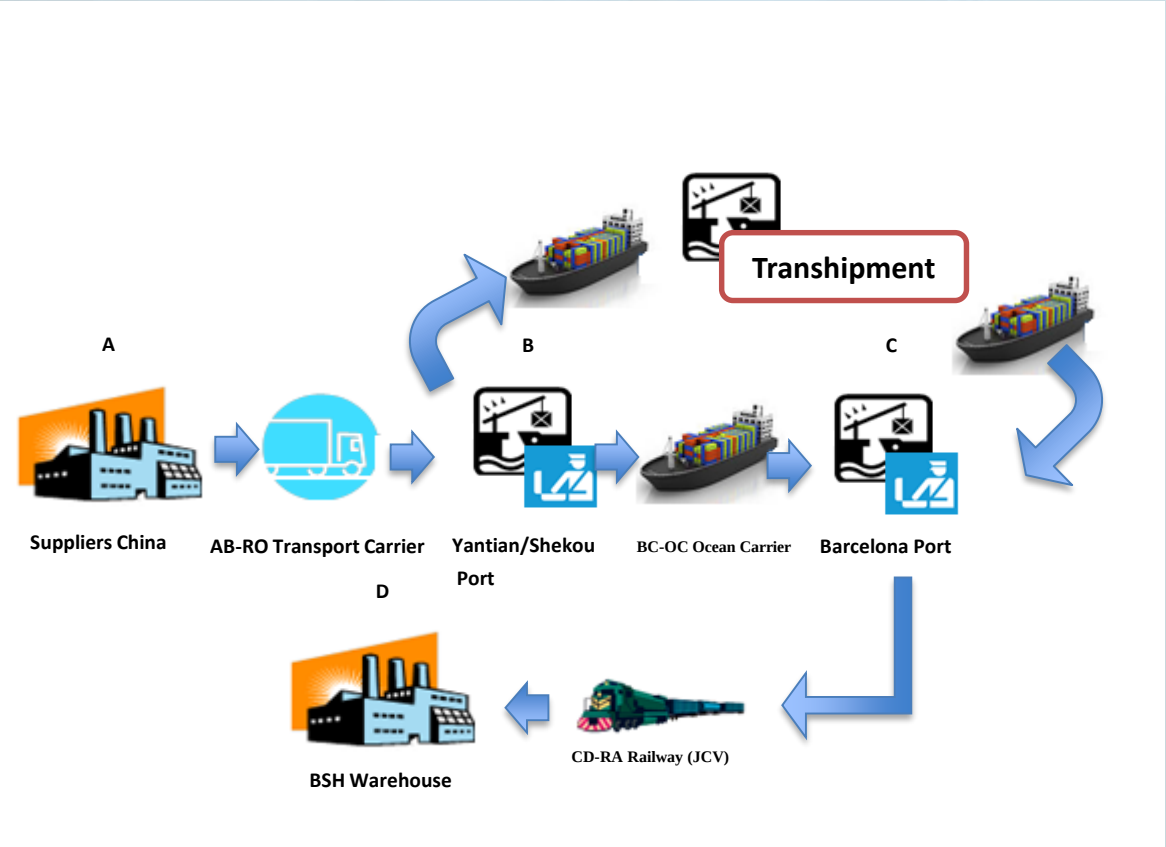
ISL Institut für Seeverkehrswirtschaft und Logistik

CORE PROJECT
Demostrator Bosch-Siemens home appliances



B/S/H/

BSH Tradelane



B/S/H/

Import Tradelane:
Port of Yantian/Shekou – Zaragoza Warehouse

Involved Stakeholders:
ZLC, BSH, ENIDE, PORTIC, Inlecom, FOI, CLMS

Cargo:
Containers with household appliances (e.g. washing machines)

Problem and objectives

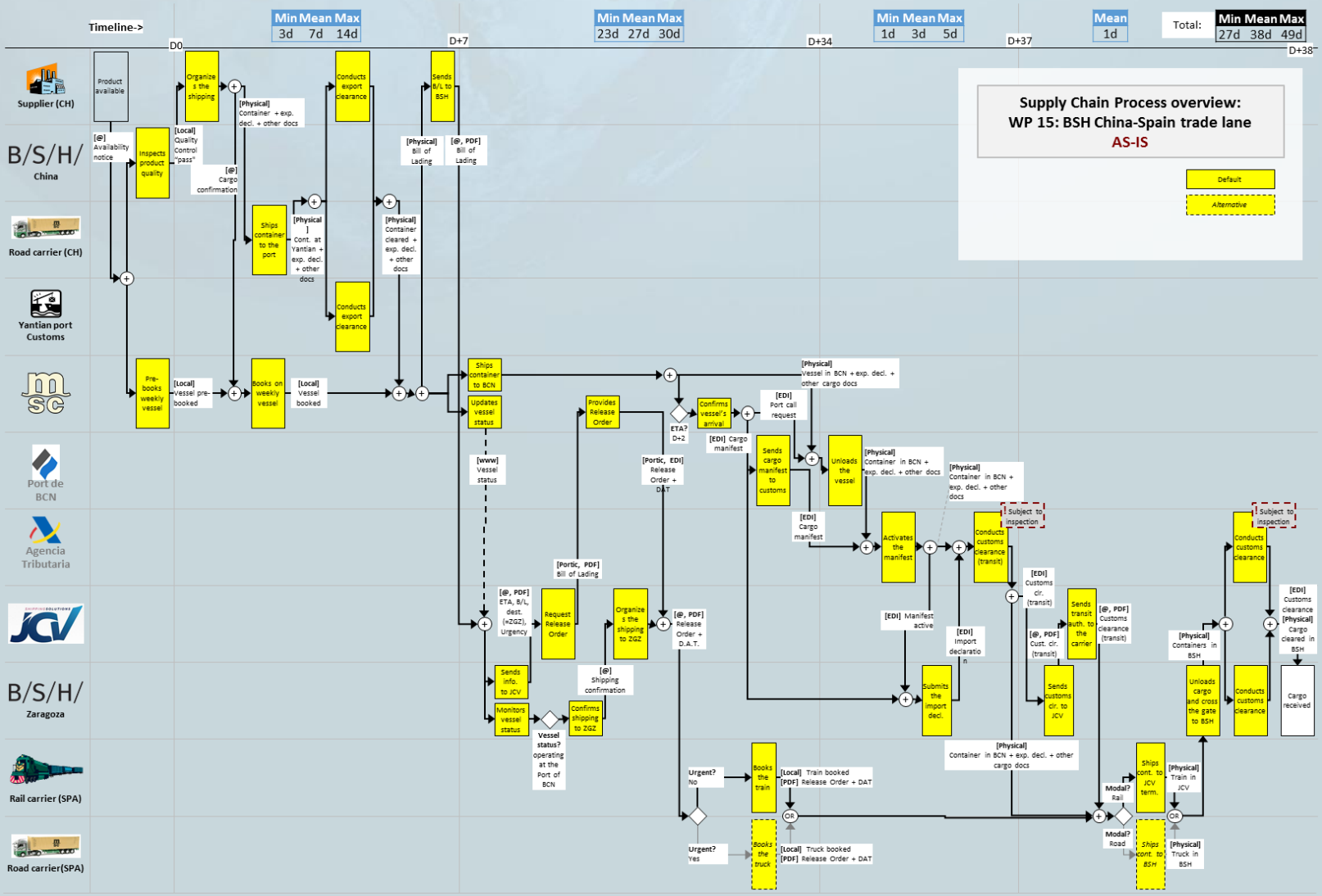
- The problem that BSH Electrodomesticos España experiences is that containers may be delayed or lost. Similarly, unexpected customs inspections increase delivery times variability, leading to delays in intermodal operations in Barcelona.

- This has two major economic consequences:
  - Unsatisfied customer demand (especially in correspondence of marketing campaigns, peak seasons or introduction of next generation machines)
  - Cost-efficiency of transport and scheduling activities.

- To establish a common IT platform where data is collected and reused to:

  - Automatically fill in customs transit declarations
  - Provide with more accurate ETAs

Business process analysis



Supply chain risk

Risk	Source	Process phase								Consequences
		I	II	III	IV	V	VI	VII.a	VII.b	
Inefficient communication	BSH supplier Quality Control	x								Inspection's delay; late arrival to port of departure. Sea vessel departure can be missed leading to increased lead-time
	Hapag Lloyd	x	x							Shipment delay due to breakdown of machines in the port. Necessary to stop in a transhipment hub. As a consequence containers may be lost or arrive late.
	Road carrier in China		x	x						Shipment delay due to traffic jams, increased lead-time. Cargo could be damaged. Security events like theft could appear.
	Forwarder		x		x					Export clearance delay due to lack of documentation increased lead-time
	Betwee HL and BSH					x	x	x	x	lack of coordination with logistics service providers in Spain, extra costs, increased lead-time
	Port of Barcelona					x	x	x	x	Unloading delay, lack of coordination with logistics service providers in Spain, increased lead-time, extra cost
	Between BSH and the customs						x	x	x	Import transit clearance delay (lack of documents or missing/wrong data), lack of coordination with logistics providers in Spain, increased

Taxonomy:

63 risks identified

Categorized on source/process phase and risk type

Security Certifications analysis

- Analysis of security certifications:
  - AEO
  - ISPS
  - TAPA EMEA
  - Companies' internal requirements

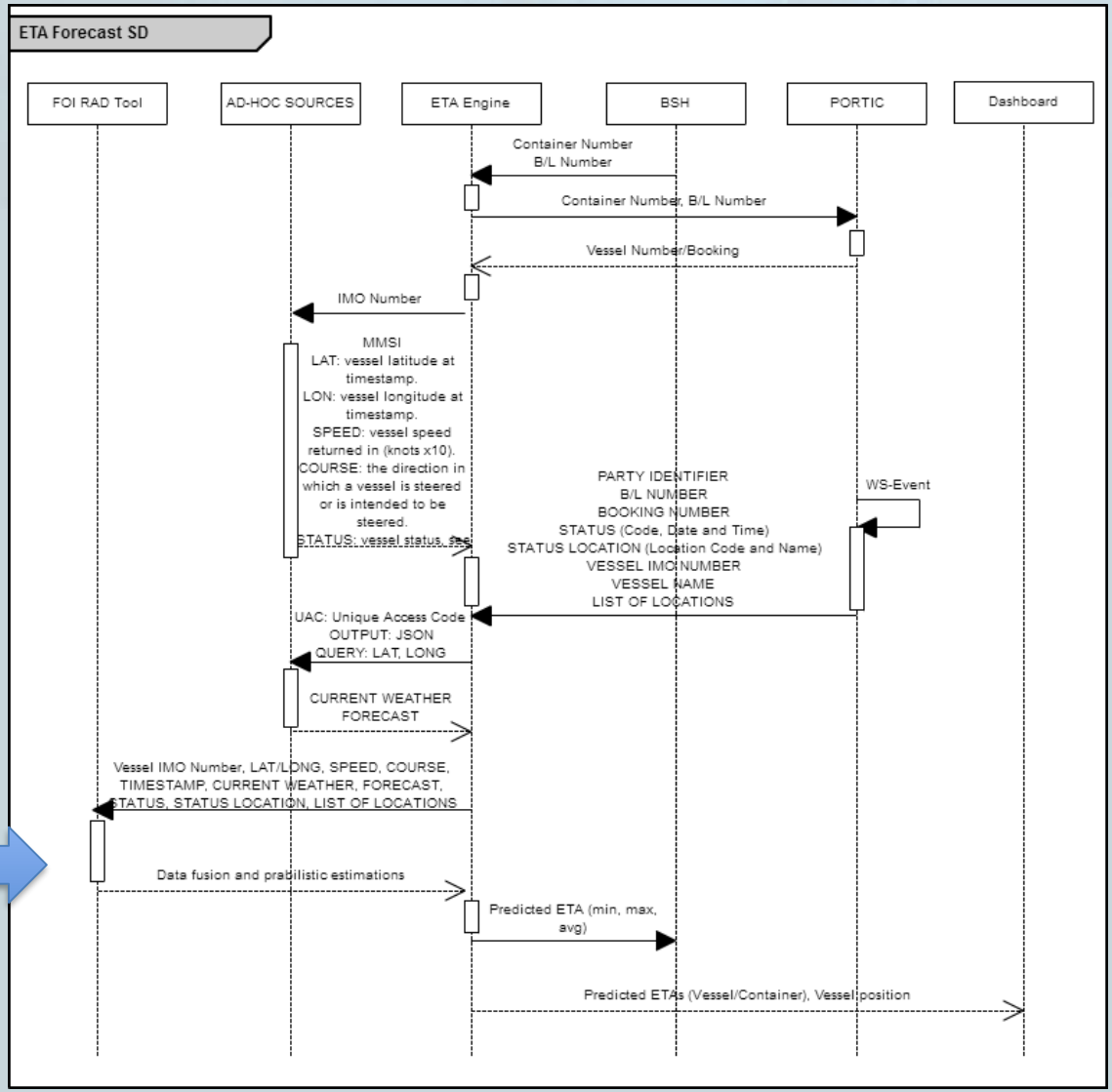
TAPA
Transported Asset Protection Association

ISPS Code

AEO

THE SOLUTION – RISK BASED ETA PREDICTOR

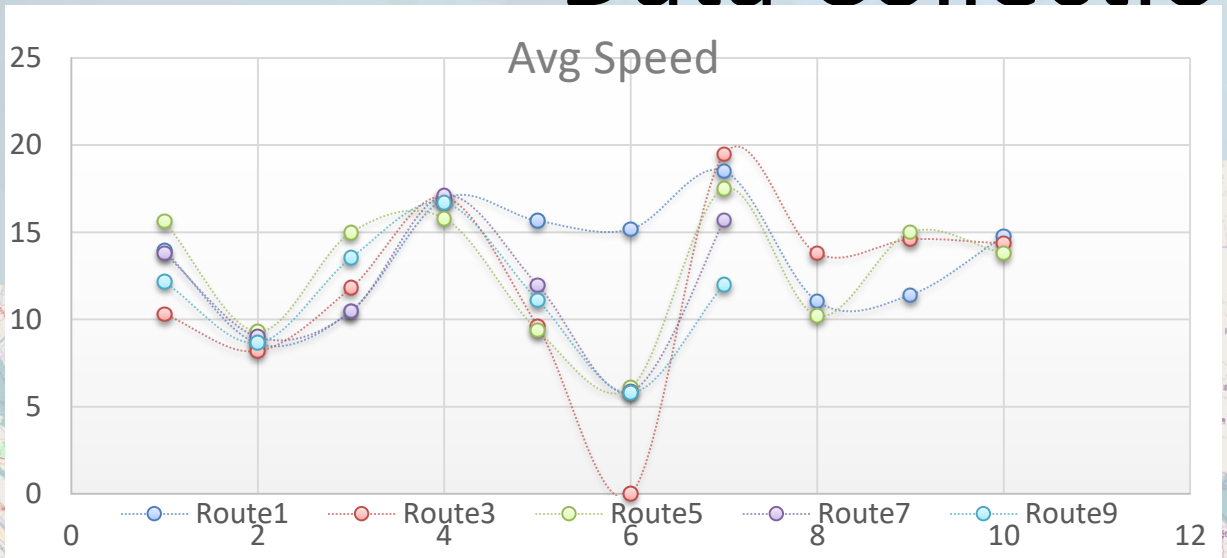
Risk Based ETA's forecasts

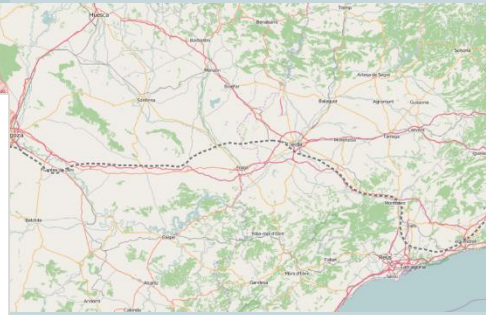


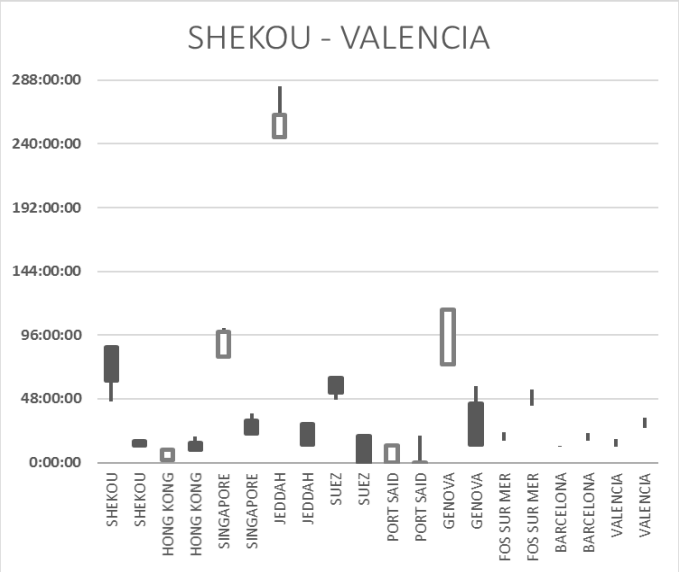
RISKS

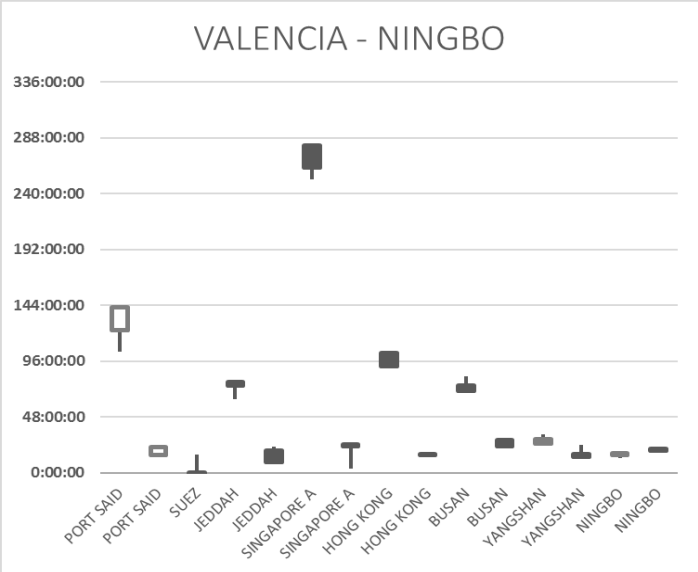
CORE EcoSystem

Data Collection



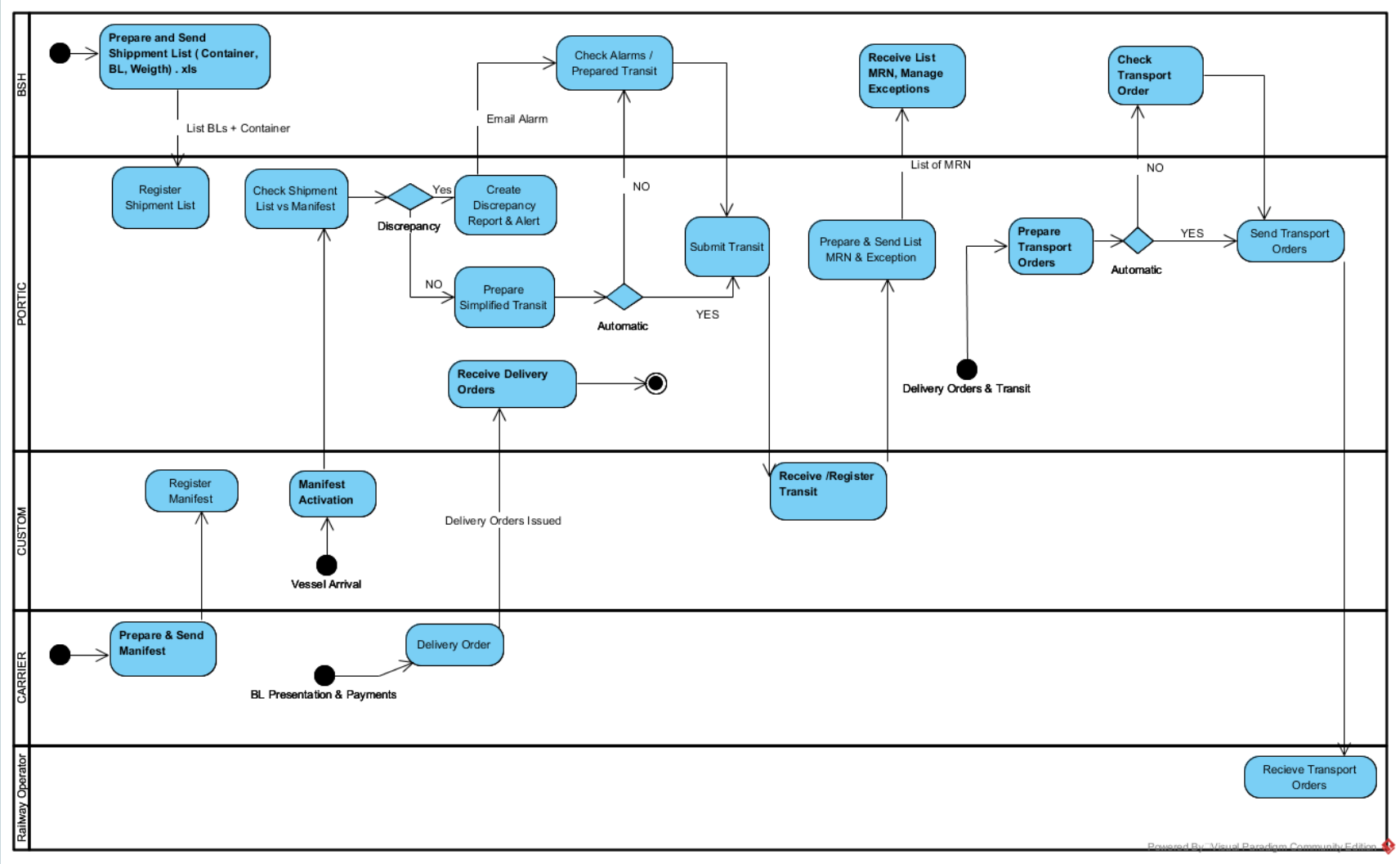


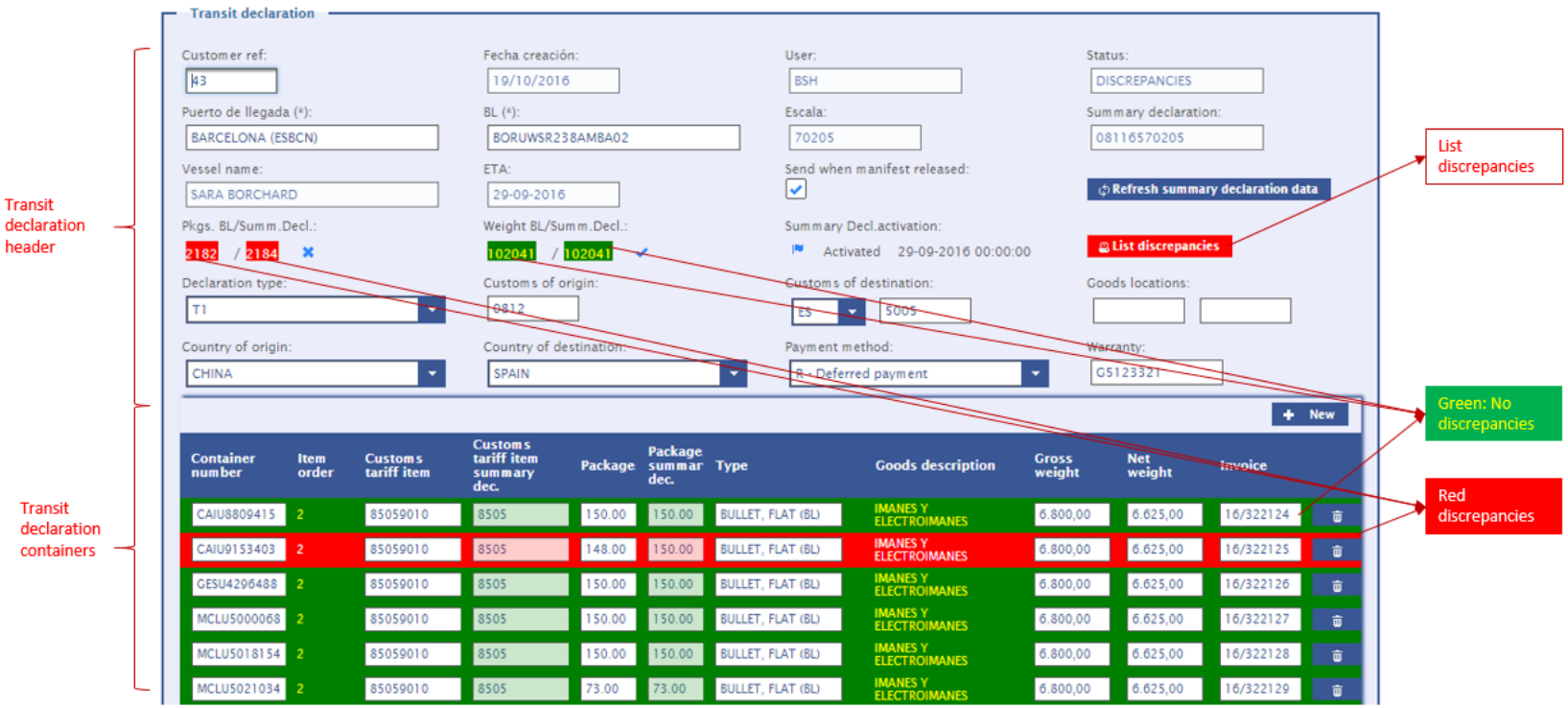




THE SOLUTION - AUTOMATED CUSTOMS TRANSIT DECLARATION

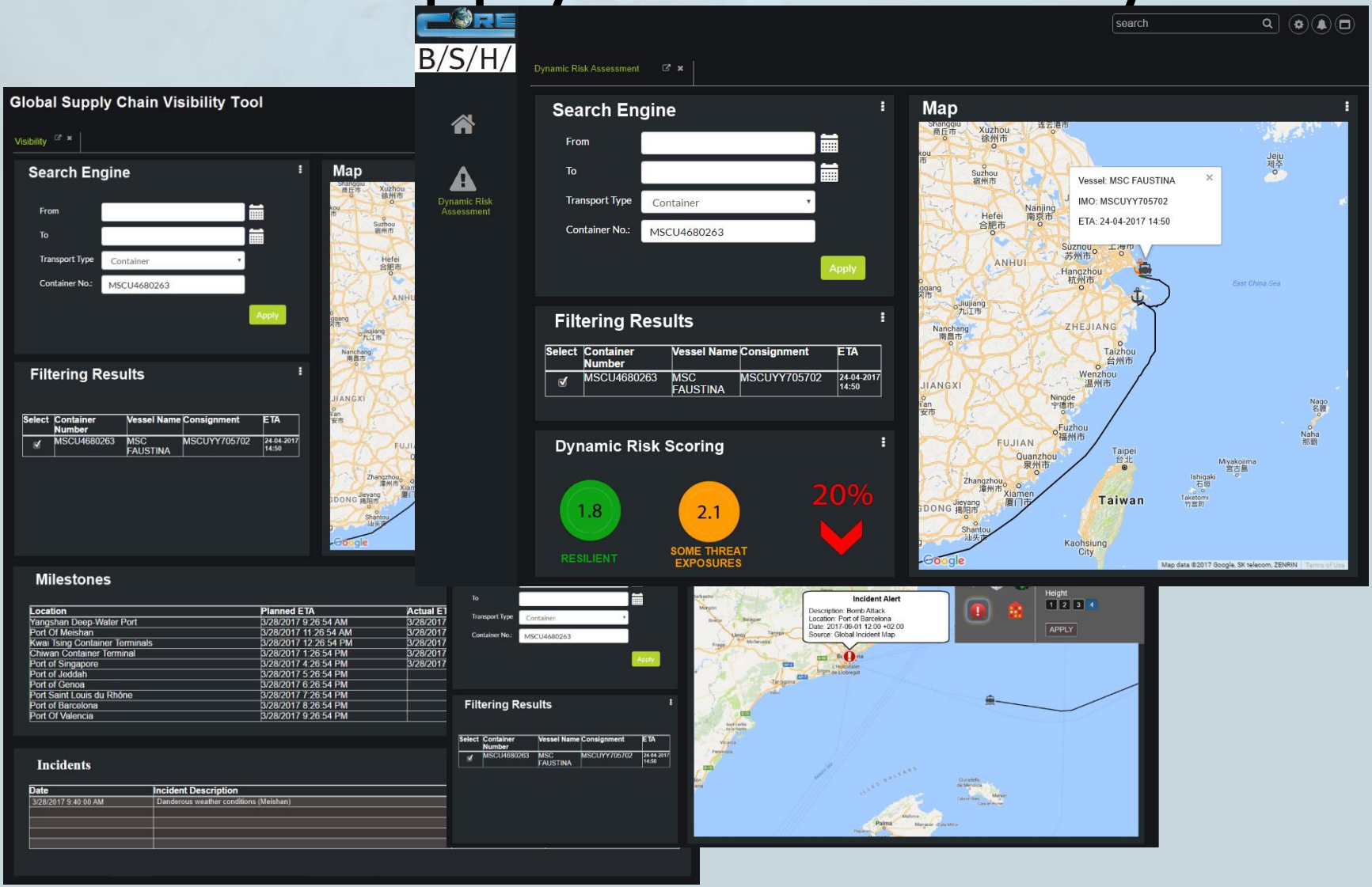
E-Customs transit declaration




Transit declaration
Customer ref: 43
Fecha creación: 19/10/2016
User: BSH
Status: DISCREPANCIES
Puerto de llegada (*): BARCELONA (ESBCN)
BL (*): BORUWSR238AMBA02
Escala: 70205
Summary declaration: 08116570205
Vessel name: SARA BORCHARD
ETA: 29-09-2016
Send when manifest released:
Refresh summary declaration data
Pkgs. BL/Summ.Decl.: 2182 / 2184
Weight BL/Summ.Decl.: 102041 / 102041
Summary Decl.activation: Activated 29-09-2016 00:00:00
List discrepancies
Declaration type: T1
Customs of origin: 0812
Customs of destination: ES 5005
Goods locations:
Country of origin: CHINA
Country of destination: SPAIN
Payment method: B - Deferred payment
Warranty: G5123321
New
Container number
Item order
Customs tariff item
Customs tariff item summary dec.
Package
Package summar dec.
Type
Goods description
Gross weight
Net weight
Invoice
CAIU8809415 2 85059010 8505 150.00 150.00 BULLET, FLAT (BL) IMANES Y ELECTROIMANES 6.800,00 6.625,00 16/322124
CAIU9153403 2 85059010 8505 148.00 150.00 BULLET, FLAT (BL) IMANES Y ELECTROIMANES 6.800,00 6.625,00 16/322125
GESU4296488 2 85059010 8505 150.00 150.00 BULLET, FLAT (BL) IMANES Y ELECTROIMANES 6.800,00 6.625,00 16/322126
MCLU5000068 2 85059010 8505 150.00 150.00 BULLET, FLAT (BL) IMANES Y ELECTROIMANES 6.800,00 6.625,00 16/322127
MCLU5018154 2 85059010 8505 150.00 150.00 BULLET, FLAT (BL) IMANES Y ELECTROIMANES 6.800,00 6.625,00 16/322128
MCLU5021034 2 85059010 8505 73.00 73.00 BULLET, FLAT (BL) IMANES Y ELECTROIMANES 6.800,00 6.625,00 16/322129
Transit declaration header
Transit declaration containers
List discrepancies
Green: No discrepancies
Red discrepancies

THE SOLUTION – GLOBAL SUPPLY CHAIN VISIBILITY TOOL

Global Supply Chain Visibility Tool



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TALENT HUB FOR SUPPLY CHAIN

B/S/H/

CLAIS

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FOI

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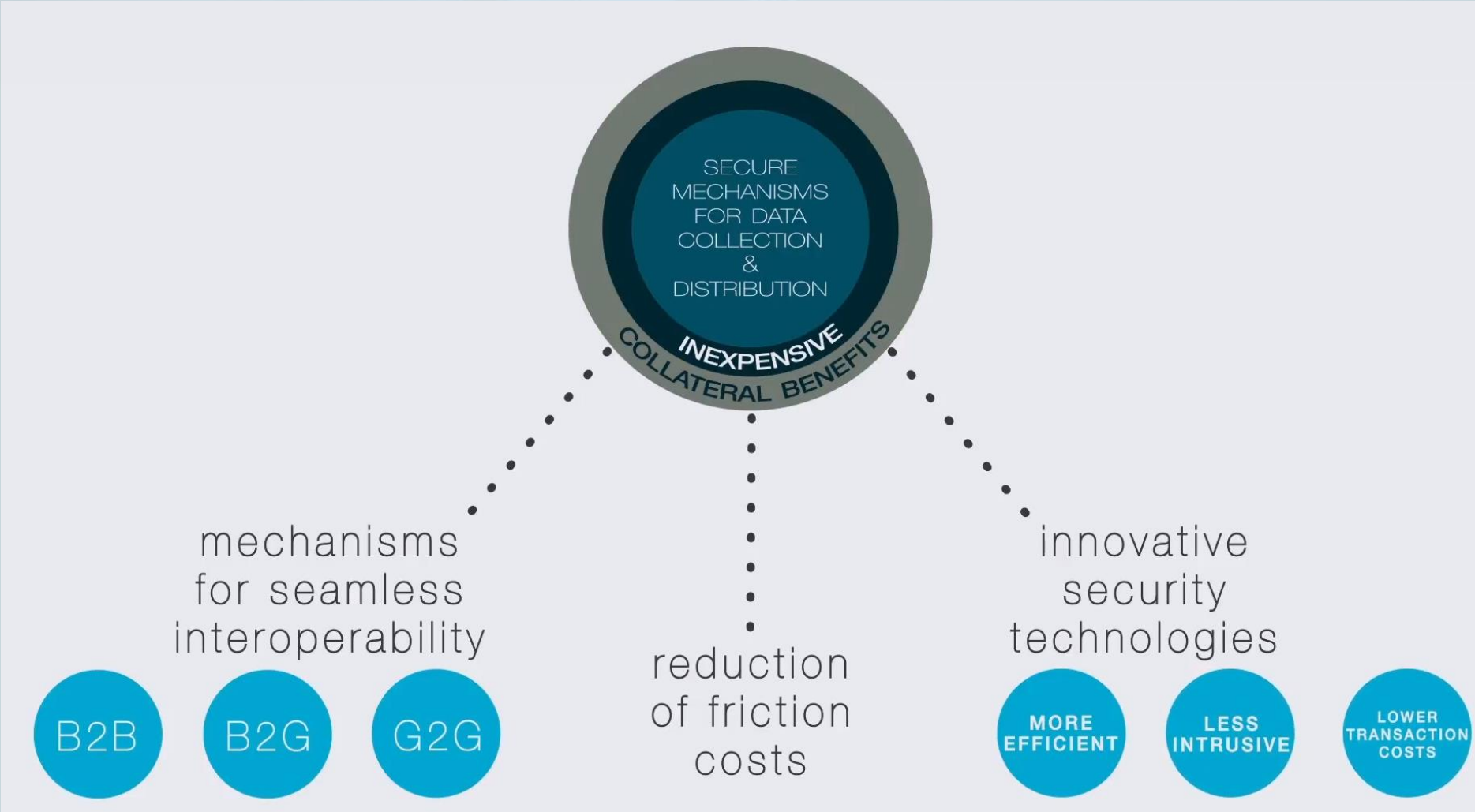
Agenda

- Challenges of global supply chains
- The role of CORE digital eco-system
- CORE demonstrators
  - Bosch Siemens Home Appliances, washing out uncertainty
  - DHL Spain, The Airbus Defence and Space challenges
- Wrap up and conclusions

CORE Approach



BMT (2017)

CORE benefits

- **Business benefits**
  - More secure supply chains
  - Increased efficiency
    - reduced capital tied up in inventories
    - Reduced lead time and ETA variability
    - Improved managerial planning, increased power in negotiations
- **Governments**
  - Societal security, safety and tax revenues
  - Switch from transaction to system based supervision
  - Coordinated border management
  - Operational efficiency and risk management

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THANKS!! QUESTIONS?